ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN

Proposed Upgradation of Existing Ship Recycling Yard at Alang Sosiya, Gujarat For Undertaking Safe and Environmentally Sound Ship Recycling Operations

Tehsil Talaja, District Bhavnagar, Gujarat

Report serial no. 11.S2.2015.EE.2205 July, 2016

Project Proponent

GUJARAT MARITIME BOARD
(Govt. of Gujarat Undertaking)
Sagar Bhavan
Sector 10-A ,
Gandhinagar-382010

Environmental Consultant

MECON LIMITED
(A Govt. of India Enterprise)
Vivekananda Path
PO. Doranda
Dist – Ranchi, Jharkhand - 834002
CERTIFICATE NO: NABET/EIA/1417/SA 007

ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN

Proposed Upgradation of Existing Ship Recycling Yard at Alang Sosiya, Gujarat For Undertaking Safe and Environmentally Sound Ship Recycling Operations

Tehsil Talaja, District Bhavnagar, Gujarat

Report serial no. 11.S2.2015.EE.2205 July, 2016

Project Proponent

GUJARAT MARITIME BOARD
(Govt. of Gujarat Undertaking)
Sagar Bhavan
Sector 10-A ,
Gandhinagar-382010

Environmental Consultant

MECON LIMITED
(A Govt. of India Enterprise)
Vivekananda Path
PO. Doranda
Dist – Ranchi, Jharkhand - 834002
CERTIFICATE NO: NABET/EIA/1417/SA 007

GUJARAT MARITIME BOARD

UNDERTAKING

I, hereby undertake that the prescribed Terms of Reference with respect to EIA/EMP studies for Proposed Upgradation of Existing Alang-Sosiya Ship Recycling Yard for undertaking safe and environmentally sound ship recycling operations located in Talaja Tehsil of Bhavnagar District, Gujarat has been complied with while conducting the EIA studies. The content (information & data) as given by our consultant in the EIA Report are factually correct with full knowledge of the undersigned.

Date: 1st July 2016

Place: Gandhinagar

DEPUTY GENERAL MANAGER (ENV)
ENVIRONMENT CELL
GUJARAT MARITIME BOARD
GANDHINAGAR.

OFFICE OF THE VICE CHAIRMAN & CHIEF EXECUTIVE OFFICER
G.M.B.

Head Office : Sector - 10/A, "Chh" Road, Opp. Air Force Station, Gandhinagar - 382010. Gujarat (INDIA)
Phone : (91-079) 23238346-47-48-51 Fax : (91-079) 23234704 Telefax : 079-23234705
E-mail : gmbad1@sancharnet.in Website : www.gmbports.org

मेकॉन लिमिटेड (भारत सरकार का संस्थान)
MECON LIMITED (A GOVERNMENT OF INDIA ENTERPRISE)

ISO 9001 Company

स्वच्छ भारत
एक कदम स्वच्छता की ओर

प्रधान कार्यालय (Head Office) : राँची-2, झारखण्ड, भारत, Ranchi-2, Jharkhand, India, फोन/Phone : 0651-2483000, फैक्स/Fax : 0651-2482189/2482214
ई-मेल/E-mail : ranchi@meconlimited.co.in, वेबसाइट/Website : http:// www.meconlimited.co.in
CIN No. : U74140JH1973GOI001199

Declaration by Experts contributing to the EIA for EIA/EMP Report for Proposed Upgradation of Alang – Sosiya Ship Recycling Yard, Dist., Bhavnagar, Gujarat

We, hereby certify that we were a part of the EIA/EMP report team in the following capacity that developed the above EIA.

EIA Coordinator:

Name : Suvamoy Adak

Signature & Date : 02-07-16

Period of Involvement: 01-02-2015 till date.

Contact Information: Ph: 0651-2481314; e-mail: envenggranchi@meconlimited.co.in

Functional Area Experts

Sl. No.	Functional Areas	Name of Expert	Involvement (Period & Task)	Signature
1.	AP	C.D. Goswami	Feb.,2015 till date Air Pollution Prevention, Monitoring & Control	
		S. Adak	01-02-15 till date Air Pollution Prevention, Monitoring & Control	
2.	WP	S. Adak	01-02-15 till date Water Pollution Prevention, Control & Prediction	
		Dr. Bipul Kumar	Feb.,2015 till date Water Pollution Prevention, Control & Prediction	
3.	SHW	Dr. Bipul Kumar	Feb.,2015 till date Solid Waste & Hazardous Waste Management	
		S. Budhraja (*As FAA*)		
4.	SE	Dr. S. Bhattacharya	Feb.,2015 till date Socio-economic studies.	
5.	EB	S. Adak	Nov.,2014 till date Ecology and Biodiversity.	
6.	GEO	A.K. Mishra	Feb.,2015 till date Geology.	
7.	SC	Dr. S.K. Singh	Feb.,2015 till date Soil Conservation	
8.	AQ	Dr. V.V.S.N. Pinakapani	Feb., 2015 till date Meteorological and Air Quality Modeling and Prediction	
		S. Budhraja (*As FAA*)		

Major Offices:

नई दिल्ली/New Delhi
+91-11-2204 1201 (Phone)
+91-11-2204 1214 (Fax)
delhi@meconlimited.co.in

मुम्बई/Mumbai
+91-22-2781 2155-58 (Phone)
+91-22-2781 2275 (Fax)
mumbai@meconlimited.co.in

कोलकाता/Kolkata
+91-33-2282 2381-82 (Phone)
+91-33-2282 4441 (Fax)
kolkata@meconlimited.co.in

चेन्नई/Chennai
+91-44-2618 4873 (Phone)
+91-44-2618 4874 (Fax)
chennai@meconlimited.co.in

बेंगलुरू/Bangalore
+91-80-2657 1661-63 (Phone)
+91-80-2657 6352 (Fax)
bangalore@meconlimited.co.in

Sl. No.	Functional Areas	Name of Expert	Involvement (Period & Task)	Signature
9.	NV	Dr. Vikas Kumar	Feb.,2015 till date Noise	Vikas
10.	LU	Vishal Skaria	Feb., 2015 till date Land Use studies.	Vishal Skaria
11.	RH	D. Shashiraj	Feb., 2015 till date Risk Assessment & Hazard Management	Dhariraj
12.	HG	Palash Banerjee	Feb., 2015 till date Hydrology, Ground water & Water Conservation	

Declaration by the Head of the Accredited Consultant Organization / Authorised Person

I, C.D. Goswami hereby confirm that the above mentioned experts prepared the EIA/EMP report for Proposed Upgradation of Alang-Sosiya Ship Recycling Yard. I also confirm that I shall be fully accountable for any mis-leading information mentioned in this statement.

Signature:

(C. D. GOSWAMI)
GM
ENV. ENGG. Section
&
Authorised Signatory for
Prescribed EIA Accreditation

Name: C.D.Goswami

Designation: General Manager (Env. & Sustainable Development)

Name of the EIA Consultant Organization: MECON Limited

NABET Certificate No.: NABET/EIA/1417/SA 007

Certificate Valid Up to: February 4, 2017

COVERAGE OF TERMS OF REFERENCE

Sl. No.	ToR	Chapters	Pages	Remarks
i	Submit the details of the processes for each activity, generation of wastes, types quantity and methodology for collection, storage, treatment and disposal of wastes	2	36 - 54,	Ships are beached during high tide. After discharge of ballast, ships are winched towards shore. After receipt of necessary clearances, detachable items dismantled and removed. Ships cut up with LPG-oxygen torches. Recovered materials will be dispatched by trucks. In future ships with hazardous materials on board will be dry docked for decontamination. Decontaminated ships will be undocked and beached.
		4	112 - 141	~14900 t/yr of hazardous solid wastes and 1550 t/yr of MSW expected to be generated, which will be sorted and packed as hazardous and non-hazardous which will all be disposed to dedicated TSDF located in Alang Notified Area. Administrative measures are in place to ensure ships adhere to IMO regulations regarding ballast water, bilge water and slops. Effluents remaining on board and generated during cutting are collected and sent by tankers to ETP at Alang TSDF.

Sl. No.	ToR	Chapters	Pages	Remarks
ii	MoU with authorized agency for disposal of hazardous wastes, if any	2 4	33 128	The SRY has its own dedicated TSDF located within Alang Notified Area
iii	Submit details of baseline marine water quality and likely impact due to ship breaking and mitigation proposed	3 4	79 - 87 131 - 133 136 - 141	Sea water quality when compared with Coastal Water Quality Criteria specified designated best uses, the water quality meets criteria specified for SW-IV and SW-V. For the other uses the turbidity is too high. No untreated effluents are discharged into the sea. All effluents generated at the project are trucked to ETP for treatment.
iv	Submit the details of personal protective equipments (gas masks, dust masks, hand gloves, safety shoes, safety goggles etc.) for workers engaged in cutting, dismantling, isolation and segregation process.	4 7	122-125 158-163 217	Workers engaged in asbestos handling shall wear full body protective clothing including respirators & gloves. Workers involved in paint stripping shall wear goggles & dust masks. Workers engaged in gas cutting shall wear gloves, goggles and gas masks. All workers shall put on helmets and safety boots.
v	Submit the details of the reclamation along with the source of materials and its quantity and quality	-	-	No reclamation shall be required
vi	Submit the details of shoreline changes along with the shore protection, if any required	3 4	63 - 66 112	No shoreline changes anticipated

Sl. No.	ToR	Chapters	Pages	Remarks
vii	Details of Environmental Management Plan and Environmental Monitoring Plan with parameters and costs be submitted.	6 9	181 – 190, 237 - 239	Wind speed & direction, temperature, rainfall, humidity and physical oceanographic conditions monitoring round the clock. Ambient & work zone air quality and noise levels, sea water quality, effluent quality and sediment quality monitoring as per GPCB / MoEFCC directives. Record maintenance of solid waste generation and disposal. Regular health monitoring of workers. The capital cost and recurring costs for environmental facilities for the project estimated to be Rs. 1136.694 crores and up to Rs. 16.797 crores per year respectively.
viii	Submit the details of Oil Spill Contingent Management Plan	7	215-217	
ix	Submit the details of Risk Assessment, Disaster Management Plan, including emergency evacuation during natural and man-made disaster like floods, cyclone, tsunami and earthquake etc.	7	198 - 215	
	General guidelines			
i	The EIA document shall be printed on both sides, as far as possible			Noted and complied

Sl. No.	ToR	Chapters	Pages	Remarks
ii	All documents should be properly indexed, page numbered			Noted and complied
iii	Period / date of data collection should be clearly indicated			
iv	Authenticated English translation of all material provided in Regional languages			Noted and complied
V	The letter / application for EC should quote the MoEF&CC File No. and also attach copy of the letter prescribing ToR			Noted and complied
vi	The copy of the letter received from the Ministry on the ToR prescribed for the project should be attached as Annexure to the Final EIA/EMP Report	1	7 - 12	Enclosed as Annexures 1.1 & 1.2
vii	The final EIA/EMP Report submitted to the Ministry must incorporate the issues in the ToR and that raised in the Public Hearing. The index of the Final EIA/EMP Report must indicate the specific Chapter and page no. of the EIA-EMP Report where the specific ToR prescribed by the Ministry and the issue raised in the P.H. have been incorporated. Questionnaire related to the project (posted on MoEF&CC website) with all sections duly filled in shall also be submitted at the time applying for EC			Duly filled Questionnaire for Environmental Appraisal for Industry Sector Projects (there is no Questionnaire for Ship-Breaking Yard Projects) Included in the EIA Report
viii	Grant of ToR does not mean grant of EC			Noted
ix	Grant of ToR/EC to the present project does not mean grant of approvals in other regulations such as the Forest (Conservation) Act, 1980 or the Wildlife (Protection) Act, 1972			Noted
x	Grant of EC is also subject to Circulars issued under the EIA Notification, 2006 which are available on MoEF&CC Website			Noted

Sl. No.	ToR	Chapters	Pages	Remarks
xi	The status of accreditation of the EIA consultant with NABET / QCI shall be specifically mentioned. The consultant shall certify that his accreditation is for the sector for which this EIA is prepared.	11	243-252	The EIA/EMP report has been prepared by MECON Limited, a Public Sector undertaking under the Ministry of Steel Government of India. MECON Limited is accredited by QCI/NABET for preparing EIA/EMP reports in 16 major sectors, including "*All Ship-breaking Yards including Ship-breaking Units*" vide their certificate no. NABET/EIA/1417/SA 007. This certificate is valid up to 4th February, 2017. Copy of certificate enclosed in Chapter 11 (as Annexure 11.1) of Report.
xii	The front page of EIA / EMP Reports, the name of the consultant / consultancy firm along with their complete details including their accreditation, if any, shall be indicated. The consultant while submitting the EIA / EMP Report shall give an undertaking to the effect that the prescribed TORs (TOR proposed by the project proponent and additional TOR given by the MoEF) have been complied with and the data submitted is factually correct (Refer MoEF office memorandum dated 4th August, 2009).		Page- B, C	Noted and complied. Front page of EIA Report gives necessary details of M/s MECON Ltd. the EIA Consultant firm . Signed undertaking by EIA Co-ordinator and involved Functional Area Experts of MECON on company letter-head enclosed in EIA Report.
xiii	While submitting the EIA / EMP Reports, the name of the experts associated with / involved in the preparation of these		Page-B, C,	Signed undertaking by EIA Co-ordinator and involved Functional Area Experts of MECON on company letter-head enclosed

Sl. No.	ToR	Chapters	Pages	Remarks
	reports and the laboratories through which the samples have been got analysed should be stated in the report. It shall clearly be indicated whether these laboratories are approved under the Environment (Protection) Act, 1986 and the rules made there under (please refer MoEF Office Memorandum dated 4th August, 2009). The project leader of the EIA Study shall also be mentioned.	11	249	in EIA Report. Copy of Gazette notification according MoEF recognition to laboratory involved in sampling & analysis also included (in Chapter 11 of Report).
xiv	All the ToR points as presented before the Expert Appraisal Committee (EAC) shall be covered	Under ToR Compliance	i-vi	Noted and complied

CONTENTS

LIST OF FIGURES

LIST OF DRAWINGS

Sl. No.	Drawing No.	Title
1	*MEC/Q770/11/S2/01*	*GOOGLE EARTH IMPAGE SHOWING LOCATIONS OF KEY PROJECT COMPONENTS*
2	*MEC/Q770/11/S2/02*	*IMAGE MAP OF DRY DOCK 1 LAYOUT*
3	*MEC/Q770/11/S2/03*	*LAYOUT OF A MODERNISED SHIP RECYCLING PLOT*
4	*MEC/Q770/11/S2/04*	*LAYOUT OF TSDF*
5	*MEC/Q770/11/S2/05*	*GOOGLE EARTH IMAGE OF STUDY AREA SHOWING LOCATIONS OF MONITORING STATIONS*
6	*MEC/Q770/11/S2/06*	*LANDUSE IN THE STUDY AREA*

LIST OF ANNEXURES

ANNEXURE NO.	TITLE
1.1	*Approved ToR*
1.2	*MoM OF 147th Meeting of EAC*
1.3	*Copy of Gujarat Coastal Zone Management Authority's Recommendation*
2.1	*Documents to be Submitted for Obtaining Permission from Customs and Port Authorities for Entry of the Ship to the Port*
2.2	*Documents Required for Grant of Beaching Permission*
2.3	*Documents Required for Grant of Cutting Permission*
4.1	*Standard Format of the Advance Notification Form for waste delivery to port reception facilities*
4.2	*Ballast Water Reporting Forms (IMO)*
4.3	*Specifications of Asbestos Dismantling Enclosure*
11.1	*Copy of NABET Accreditation Certificate of MECON*
11.2	*Copy of NABL Certificate of M/s Mitra S.K. Pvt. Ltd.*
11.3	*Copy of NABET Accreditation Certificate of M/s Terracon Ecotech Pvt. Ltd.*

LIST OF ABBREVIATIONS, SYMBOLS AND UNITS

Abbreviation / Symbol / Unit	Full Form
AAQ	*Ambient Air Quality*
AAS	*Atomic Absorption Spectrophotometer*
AC	*Air Conditioner*
ACM	*Asbestos Containing Material*
ACWM	*Asbestos Containing Waste Material*
AERB	*Atomic Energy Regulatory Board*
AMSL	*Above Mean Sea Level*
@	*At the Rate of*
BDL	*Below Detection Limit*
BOD	*Biochemical Oxygen Demand*
BWM	*Ballast Water Management*
cc	*Cubic Centimetre*
CFC	*Chloro Fluoro Carbon*
CO	*Carbon Monoxide*
CO_2	*Carbon di Oxide*
CPCB	*Central Pollution Control Board*
CRZ	*Coastal Regulation Zone*
dB	*Decibels*
DG	*Diesel Generator*
DISH	*Directorate of Industrial Safety and Health*
DWT	*Dead Weight Tonnage*
EC	*Environmental Cell*
EIA	*Environmental Impact Assessment*
EMP	*Environmental Management Plan*
F.O	*Furnace Oil*
GCA	*Gross Cropped Area*
GCZMA	*Gujarat Coastal Zone Management Authority*
GEPIL	*Gujarat Enviro Protection & Infrastructure Ltd.*
GJ	*Giga Joules*
GLC	*Ground Level Concentration*
gm/cc	*Grams per Cubic Centimetre*
g/m^3	*Grams per Cubic Metre*
GMB	*Gujarat Maritime Board*
GPCB	*Gujarat Pollution Control Board*
g/s	*Grams per Second*
ha	*Hectare*
HDPE	*High Density Poly Ethylene*
HEPA	*High Efficiency Particulate Air*

Abbreviation / Symbol / Unit	Full Form
HSD	*High Speed Diesel*
HVAS	*High Volume Air Sampler*
ILO	*International Labour Organisation*
IMD	*India Meteorological Department*
IMO	*International Maritime Organisation*
Kg	*Kilogram*
Kg/d	*Kilograms per Day*
km	*Kilometre*
km^2	*Square Kilometre*
km/hr	*Kilometres per Hour*
knot	*Nautical Miles Per Hour*
kW	*Kilo Watt*
LDO	*Light Diesel Oil*
LDT	*Light Displacement Tonnage*
LD_{50}	*Lethal Dose 50 (i.e. lethal dose for 50% of the test animals)*
Leq	*Log Equivalent*
LNG	*Liquified Natural Gas*
LOX	*Liquid Oxygen*
LPG	*Liquified Petroleum Gas*
m^2	*Square Metre*
m^3	*Cubic Metres*
m^3/d	*Cubic Metres per day*
meq/gm	*Milli Equivalents per Gram*
mg/kg	*Milligrams per Kilogram*
mg/l	*Milligrams Per Litre*
MHWN	*Mean High Water Neap*
MHWS	*Mean High Water Spring*
MLWN	*Mean Low Water Neap*
MLWS	*Mean Low Water Spring*
MoEFCC	*Ministry of Environment, Forest and Climate Change, Govt. Of India*
mm	*Millimetre*
MPN	*Most Probable Number*
MSL	*Mean Sea Level*
MSW	*Municipal Solid Waste*
Mt	*Million tonnes*
$\mu g/m^3$	*Micrograms per Cubic Metre*
NAAQS	*National Ambient Air Quality Standards*
NCSCM	*National Centre for Sustainable Coastal Management*
NOC	*No Objection Certificate*

Abbreviation / Symbol / Unit	Full Form
NOx	*Oxides of Nitrogen*
NTU	*Nephelometric Turbidity Units*
OSHA	*Occupational Safety and Health Administration (of USA)*
PACM	*Presumed Asbestos containing Material*
Pb	*Lead*
PCB	*Poly Chlorinated Biphenyl*
PESO	*Petroleum and Explosives Safety Organisation*
PM	*Prime Minister*
PMO	*Prime Minister's Office*
PM_{10}	*Particulate Matter less than 10 micron in diameter*
$PM_{2.5}$	*Particulate Matter less than 2.5 micron in diameter*
PPE	*Personal Protective Equipment*
ppm	*Parts Per Million*
PUF	*Poly-Urethane Foam*
RDS	*Respirable Dust Sampler*
RPM	*Respirable Particulate Matter*
R & R	*Rehabilitation and Resettlement*
Rs.	*Rupees*
RSO	*Radiological Safety Officer*
SO_2	*Sulphur Dioxide*
SPM	*Suspended Particulate Matter*
SRFMP	*Ship Recycling Facility Management Plan*
SSRP	*Ship Specific Recycling Plan*
SRIA	*Ship Recycling Industries Association (India)*
SRY	*Ship Recycling Yard*
t	*Tonnes*
TBT	*Tri Butyl Tin*
t/d	*Tonnes per Day*
TLV	*Threshold Limit Value*
TSDF	*Treatment, Storage and Disposal Facility*
TSI	*Thermal System Insulation*
w.e.f	*With Effect From*

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

1.0 PROJECT DESCRIPTION

Alang-Sosiya Ship Recycling Yard (SRY) is the world's largest ship recycling yard. It has been in operation since 1982. It is under the administrative control of Gujarat Maritime Board (GMB) which was established by the Government of Gujarat in 1982 under the Gujarat Board Act, 1981.

Alang-Sosiya SRY stretches over a ~10 km stretch of coastline along the western shore of the Gulf of Khambat. It can be approached from the nearest city Bhavnagar by NH-8E (up to Trapaj) and SH-37 (from Trapaj). A concrete service road runs along the entire length of the SRY. GMB has developed 167 plots for ship recycling which have been leased to private entrepreneurs. Of the 167 plots 88 plots are in the Alang area (southern part of the yard) and 79 are in Sosiya area (northern part of the yard).

GMB has undertaken a programme to upgrade and expand the existing yard, improve waste collection and disposal, safety and amenities available for workers. The project will be funded by Japan International Co-operation Agency (JICA). The salient features of the project are:

Proposal	Upgradation of existing Alang-Sosiya Ship recycling yard by: A. **Upgradation of Existing Ship recycling plots:** 70 plots in Phase-I and remaining 97 plots in Phase-II. B. **Hazardous Material Removal Pre-treatment Facility**: Constructing two nos. of Dry dock facility for ships for pre-cleaning of hazardous materials and wastes (Dimension: l×b×h = 300m × 50m 11.5m). Dry-dock 1 at southern end of existing yard and Dry-dock 2 about 2 km further south. Both the dry docks may also be used for ship repair and ship building purposes when there are no ships available for decontamination. C. **Additional Environmental facilities:**(1).Waste oil treatment system (2). Incinerator at the existing dedicated Treatment Stabilization and Disposal Facility (TSDF) site located within Alang-Sosiya Notified Area. D. **Improvement of Labour welfare infrastructure**: Housing including hospital facilities, community centreand community school to be developed for welfare of labourer's working at the Yard (Total built up area around: 94,700 m^2). E. **Additional Plots**: 15 nos. 100 x 90 m plots between two proposed dry-docks.
Location of Project	Alang (C.T.), Village Alang-Sosiya& Village Mathavda; Talaja Tehsil, Bhavnagar Dist., Gujarat (on western shore of Gulf of Khambat)
Latitude	21°21'43.87" N to 21°26'28.32" N
Longitude	72°09'19.79" E to 72°13'29.78" E
Land Use	Barren sea beach & scrub lands immediately behind beach. No private land involved.

Capacity	Present: Recover ~4 million tonnes per year (Mt/yr) materials from ~400 ships per year Proposed: Recover ~5.5 Mt/yr materials from ~600 ships per year
Method of Working	Present: Beaching; Proposed: Dry-docking followed by Beaching (for special concern ships)
Resource Requirements	Present: LPG – 16000 t/yr; Oxygen – 72 x 10^6 Nm^3/yr; HSD – 2000 kl/yr. Proposed: LPG – 22000 t/yr; Oxygen – 99 x 10^6 Nm^3/yr; HSD – 2750 kl/yr.
Electricity Demand	Present: 1.35 MW; Proposed: 3 MW
Waste Generation	After expansion - 14900 t/yr of hazardous wastes + 1550 t/yr of municipal solid wastes
Waste Disposal	To dedicated Treatment Storage and Disposal Facility (TSDF) at Alang
Dredging Quantity	Capital Dredging: 2 x 10^6 m^3; Maintenance Dredging: 0.2 x 10^6 m^3 / yr. Excavated rocks and sand will be used for construction of dry-docks, paving of plots, roads and other infrastructure.
Water Demand	2000 m^3/day industrial water + 2400 m^3/day potable water +37500 m^3/day water for labour colony
Water Source	Industrial water – Sea water & treated effluents; Potable water – By pipeline from Trapaj + from bore wells located far inland in tankers
Manpower	~40,000 Direct employment + ~500,000 indirect employment
Infrastructure	Mostly existing. Service road, power lines, water supply pipeline have to be extended.
Proposed Investment	Rs.1630 Crores

2.0 DESCRIPTION OF THE ENVIRONMENT

The study area covers 5 km radius area around the project site. Because the project site is located on the sea coast, about half the study area is within the sea. Baseline environmental data generation was carried out during full summer season, 2015 covering March, April and May. Primary data was also augmented by data from secondary sources. The baseline environmental data generation covered micro-meteorology, land use, air quality, water quality, noise levels, soil quality, ecology, traffic density and socio-economic environment. Information on physical oceanographic conditions, climate and population were collected from secondary sources.

Micro-Meteorology

A meteorological station was set up at one of the ship breaking plots near the southern end of the existing ship recycling yard i.e. close to the proposed expansion site. Air temperature, wind-speed and direction and relative humidity were recorded at one hour intervals continuously throughout the monitoring period. Rainfall was recorded on a daily basis.

It was noted that air temperature ranged between ~37°C and ~22°C. The pre-dominant wind directions were west, west-north-west and west-south-west. Winds prevailed from these directions together for almost 1/3 of the monitoring period. During the monitoring period total rainfall was only about 5 mm, entirely during April.

Land Use

Land use was studies by analysis of satellite imagery. About 45% of the study area is the sea. Agricultural lands occupy about 37% of the study area. Scrub lands and sparse forests occupy about 9.6% of the study area. Inter-tidal mud flats occupy about 5% of the study area. Settlements occupy about 1.3% of the study area.

Air Quality

Ambient air quality was monitored at five locations (Alang Fire station, Alang village, Sosiya village, Mathavda village and Kathava village). Samples were collected for Particulate Matter (PM_{10}& $PM_{2.5}$), Sulphur-di-oxide (SO_2), and Oxides of Nitrogen (NOx) 24 hours continuously twice a week for twelve weeks (i.e. 24 samples) at each location. One hourly samples of Carbon Monoxide (CO) were collected for 24 hours at each location on each monitoring day. The results were compared with the National Ambient Air Quality Standards, 2009 for "Industrial, Residential, Rural and Other Areas". It was found that that at the villages, ambient air quality parameters were within the norms.

Work zone air quality was monitored at two ship breaking plots and at Alang waste Treatment Storage Disposal Facility (TSDF) site. The work zone air quality was within the norms fixed by the Indian Factories Act.

Water Quality

Water quality monitoring covered sea water (8 locations), Pasvivali Creek at 1 location, ground water from 4 locations and effluents (2 from ships and 1 from Alang TSDF). The results of sea and creek water analysis were compared with the "Primary Water Quality Criteria for Coastal Waters [As per Environment (Protection) Rules, 1986]. The results of ground water analysis were compared with the standards for drinking water [IS:10500 (as amended in 2012)]. The results of effluent analysis were compared with "General Standards for Discharge of Environmental Pollutants to Marine Coastal Waters" as prescribed by Ministry of Environment, Forest and Climate Change (MoEF&CC), Govt. of India.

Analysis of sea water quality indicates that it is suitable for "Industrial Cooling, Non-Contact Recreation and Aesthetics" on account of very high turbidity (probably due to strong currents and rough sea conditions).

Analysis of ground water samples indicate that ground water from Alang and Mathavda villages are unsuitable for drinking. Ground water from Sosiya and Kathava villages can be drunk in absence of any alternate source.

Samples of ship's bilge water, ship's ballast water and treated water from Alang TSDF were found to conform to the limits.

Noise levels

Ambient noise levels were one hour intervals continuously for 24 hours at Alang Fire Station and six nearby villages. At the villages, average noise levels were within the standards for Residential Areas prescribed by Central Pollution Control Board. At Alang Fire Station, the average noise levels were within the standards for Industrial Areas.

Ecology

There are no ecologically sensitive areas in and around the project site. The nearest National Park, Blackbuck National Park Velavadar is more than 60 km away. There are no mangroves in the study area.

The study area is semi-arid and consequently the vegetation is sparse and xerophytic. There are no forests in the study area. Prosopisjuliflora (Gando-baval) is the most common type of tree growing naturally in the area. The types of land animals are low because of lack of suitable habitat. However several species of common birds are found in the study area.

Study of marine ecology indicates low bio-diversity and biomass of marine plants, plankton and benthic animals. There is no commercial fishing in the Alang area.

Traffic

Number of passing vehicles at one location on SH-37 near Kathava village were counted continuously over 24 hours. It was noted that two-wheelers constituted the maximum number of vehicles plying on SH-37. More than 1200 heavy vehicles, mostly trucks, plied the road. Vehicles plied on the road round the clock though with varying density.

Socio-Economics

Socio-economic study was carried out by studying Census (2011) Records and by sample survey in nearby villages.

The population within the study area is about 57,000. The sex ratio is very low (only 538 women for every 1000 men) primarily because there are very few women (only about 68 women for every 1000 men) in Alang-Sosiya which is a shanty town populated mainly by workers employed in the ship-recycling yard. The literacy rate is about 65%. Majority of the people directly or indirectly derive their income from ship-recycling and allied activities.

From a sample survey amongst the local villagers, it was indicated that about 1/3 of the family income is spent on food, about ¼ is saved and about 1/7 is spent on children's education. Amongst the sampled villagers it was found that other than children too young to go to school almost everybody has had some education. All children of school going age are continuing with their studies.

3.0 ANTICIPATED IMPACTS AND MITIGATION MEASURES

Shore Line Changes

Alang-Sosiya SRY has been in operation since the early 1980s and no shore line changes have been observed. The two offshore dry docks will be linked to the shore by causeways to allow free movement of water and sediments.

Nevertheless, impacts of construction of dry-docks were studied by MIKE 21 Model. The Tide Inducted Current Flow simulated by MIKE 21-HD Hydrodynamic Model. Changes in sea floor due to capital & maintenance dredging were predicted by MIKE 21-ST Sediment Transport Model.

It was noted that wave activity is seen only during SW monsoon but they dissipate before reaching coastline due to multiple breaking and presence of very wide tidal flat (~1.5 km). Near-shore is formed by rocks without much sand supply to littoral drift system. Thus no changes in the shoreline morphology are anticipated.

Solid Waste Management

The expanded SRY is expected to produce 14,900 t/yr of hazardous wastes and 1550 t/yr of municipal solid wastes (MSW). These will be disposed off to the dedicated waste Treatment Storage and Disposal Facility (TSDF) at Manar village adjacent to SH-37. GMB has contracted M/s Gujarat Enviro Protection & Infrastructure Ltd. (GEPIL) to operate and maintain the TSDF. The TSDF has an incinerator (cap. 5 t/day), a hazardous waste land fill (cap. 70,000 m^3) and a 30,000 m^3capacity landfill for MSW and a 30 m^3/day Effluent treatment plant(ETP) Both the landfills have impervious linings and arrangements for collection of leachates. The TSDF has its own fleet of dedicated marked tractor trolleys for transportation of wastes from the plots to the TSDF.Additionally, it is proposed to construct a new 25 t/day capacity Incinerator adjacent to the existing one and a new 30 m^3/day ETP within the existing TSDF.

The ship's captain shall provide an inventory of wastes remaining on board in a standard format prior to beaching.

As mentioned earlier, ships of special concern may be dry-docked for decontamination prior to beaching. After decontamination but prior to undocking of the ships, the floor of the dry dock will be swept clean and all wastes will be collected, sorted, packed and sent to Alang TSDF.

As part of the decontamination process, which is pre-requisite for obtaining breaking permission from the concerned authorities, all asbestos and asbestos containing material (ACM) are removed by a team of specially trained workers wearing full body protective clothing with full face masks. The asbestos and ACM removal is carried out under the supervision of a trained Asbestos Removal supervisor. The asbestos is thoroughly wetted before removal. Only non-abrasive tools are used for asbestos removal. Removed asbestos and ACM are packed into leak proof labelled containers and stored temporarily before being

despatched to Alang TSDF with proper documentation for disposal. Recovered sub-assemblies containing asbestos and ACM are further dismantled inside a special enclosure on the plots. For smaller plots a mobile enclosure is available. This enclosure is totally enclosed and the air pressure inside is maintained at less than the outside air pressure. The enclosure is equipped with special air filters. Workers enter the enclosure after putting on full body protective clothing with full face masks in a separate chamber. After completing their work, the workers discard their used clothing in a separate chamber and shower before putting on their street clothes. The discarded clothing is packed in labelled packages before being sent to the cleaners. At Alang TSDF, there is a special masonry pit in the hazardous waste landfill for dumping asbestos waste. Each layer of asbestos waste (still packed in leak proof bags), inside this pit is cemented over to ensure complete immobilisation.

Solid wastes (waste oil and oily sludge) which are suitable for incineration [such as poly-urethane foam (PUF), thermocol, oily rags, plastics, rubber, oily sand, paint chips] are incinerated in a 5 t/day capacity incinerator at Alang TSDF. The incinerator is a dual chamber incinerator. Light diesel oil is used as start up fuel. Temperatures up to 1100^{o}C are maintained in the incinerator. The combustion gases are cooled, scrubbed with water and filtered through High Efficiency Particulate Air filters before being exhausted through a 32 m high chimney. The waste water generated due to scrubbing of the combustion gases is collected a treated in an Effluent Treatment Plant at Alang TSDF. The design of the new incinerator will be similar to that of the existing one but of a larger scale.

Liquid Waste Management

As part of the pre-beaching inspection, Gujarat Pollution Control Board, ensures that the ballast water has been exchanged as per IMO's Ballast Water Management Convention to ensure that invasive organisms are not discharged at Alang coast with ballast water.

All bilge water collected from the ships is pumped out to Alang TSDF's dedicated tankers and taken to the TSDF's ETP for physico-chemical and aerobic biological treatment. The oil recovered at the ETP is incinerated at the TSDF's incinerator. Sludge generated from the treatment process is dried and incinerated at the TSDF's incinerator. The treated water is used for industrial purposes. Oily slops from oil-tankers, if any, and oily effluents generated due to washing ships' fuel tanks are also treated at this ETP. In case of chemical tankers, if the slops remaining on board cannot be treated at Alang TSDF's ETP, the ship is advised to discharge the slops at a suitable port prior to coming to Alang.

The new ETP's design will be same as the existing ETP.

Leachates generated from Alang TSDF's landfills and the waste water generated from the TSDF's incinerator's scrubbing system are also treated at the ETP.

The proposed upgradation programme also envisages concrete paving of the plots. The pavement will be sloped so that all storm water which may be contaminated with oil and other solid debris will flow into a storm water drain at the edge of the plot. This drain will be

routed through settling pits provided with oil & grease traps. The waste collected in these settling pits will be sent to Alang TSDF.

Sewage generated at the plots' toilets is disposed through soak pits. A STP shall be set up to treat sewage generated from the labour colony.

Air Pollution and Management

The primary air pollutants from the ship recycling yard are dust generated from the roads and pavement of the ship breaking plots and oxides of nitrogen (NOx) generated due to burning of LPG and use of diesel by trucks, cranes and other diesel powered machinery. NOx and SO_2 are also generated from the incinerator.

The ground level concentration of NOx and SO_2generated due to the proposed expansion was estimated by computerised gaseous dispersion model. The calculations indicated that NOx levels from the new plots would increase but only within a 200 - 300 m of the ship recycling plots. At the nearby villages, the increase would be marginal. In case of the incinerator, NOx and SO_2levels would increase marginally within about two miles of the incinerator.

Dust generated from the roads can be reduced by having well maintained paved roads and by water sprinkling, which have already and / or is being done at Alang. Under the upgradation programme, all the plots' floors will be concreted. This will greatly reduce dust generation.

Open burning of various wastes has been stopped by various administrative measures. All combustible wastes are collected and taken to Alang TSDF for incineration in the facility's high temperature incinerator which has necessary pollution control systems.

Occupational Safety and Health

Each plot has its own Safety Officer. He is assisted by one or more safety supervisors. In addition, GMB's Alang Office has a Safety Department manned by several Safety Officers who supervise the plots' Safety Officers. One of GMB's Safety Officers is the Radiological Safety Officer (RSO) who is trained and certified by Atomic Energy Regulatory Board (AERB) whose duty is to ensure that all radio-active devices on board are identified prior to beaching and after beaching dismantled carefully and disposed off as per AERB guidelines.

The Safety Officersare responsible for issue of all necessary safety equipment to the workers. The Safety Officers and their deputies ensure the following:

- No worker carries mobile phone to his work place lest he be distracted by attending to phone calls while working.
- All workers and visitors wear safety helmets in working areas
- All workers wear safety boots.
- All workers engaged in gas cutting wear welders' goggles, gloves and masks
- Workers engaged in abrasive work, wear goggles and masks
- Workers engaged in handling heavy items and glass wear gloves.

- Operators of heavy diesel powered machinery are issued ear plugs / ear muffs.
- Enclosed spaces on board the ships are free of flammable, suffocating and toxic gases / vapours. If any such gases are present in concentrations which may pose a threat to workers' safety, the spaces shall be purged with air till they are safe for entry of workers and for working.
- There are no inflammable liquids or gasses inside pipelines or across bulk-heads which are being cut with torches
- Cables, chains used for winching ships undamaged and rated for the weight of the ship concerned.
- Unconcerned personnel are at safe distance during winching of ships.
- The LPG godown is maintained as per guidelines.
- All LPG cylinders are kept in an upright position.
- All torches and LPG cylinders' regulators are put in "off" position at end of work or during work breaks.
- Nobody is smoking or there is any open flame nearby when fuel is being unloaded from ships.
- There are adequate number of fire fighting systems on the plots and they are in working order.
- All hazardous wastes are carefully documented, packed and stored in the designated area.
- Heavy material handling machinery give audio-visual warnings while moving heavy loads.
- Life buoys are kept on ships for use during emergency evacuation in case of major fire
- Workers working at heights are provided with safety belts / harnesses.
- All other general safety rules and guidelines are followed.

As mentioned earlier asbestos removal shall be carried out by workers wearing full body clothing with facemasks and breathing apparatus under the supervision of a trained Asbestos Removal Supervisor.

All workers undergo a comprehensive pre-employment medical examination which is carried out by a trained occupational health physician retained by Ship Recycling Industries Association (India) [SRIA]. All workers also undergo periodical medical examination subsequently. However only about 20% workers are long term workers. A small hospital has been set up at Alang run be Indian Red Cross Society. There are a few private hospitals also. These hospitals have facilities to give basic medical care only (routine illnesses and injuries not requiring hospitalisation). Serious cases, after administration of basic medical aid, are transferred to well-equipped hospitals at Bhavnagar by ambulances which are available round the clock. The cost of medical treatment is borne by owner of the plot where the worker is employed. GMB and SRIA are jointly setting up a well equipped hospital with a trauma centre for workers at Alang itself.

All workers also undergo a pre-employment safety training course at GMB's Training Centre at Alang. Gas cutters are given additional training. All workers also undergo refresher training on safety.

4.0 ADDITIONAL STUDIES

Public Consultation

During the field study through questionnaire survey, villagers' opinion about the project was also considered. About 85% of the respondents expect the project to generate employment, about 8% expect increased business opportunities, while about 4% expect that the value of their land shall increase. About 23% of the respondents are apprehensive about increased pollution. Another about 23% are apprehensive about increase in accidents.

The Environmental Public Hearing (EPH) for the project was held on 20-10-15 at Gujarat Maritime Board's Training & Welfare Complex, Alang Village, Tal. Talaja; Dist. Bhavnagar. The notices for the public consultation had been published in "Western Times", Ahmedabad edition dated 19-09-2015 (English) and in "Sandesh" (સંદેશ), Bhavnagar edition dated 19-09-2015 (Gujrati). The notice of the public consultation had also been posted on Gujarat Pollution Control Board's website. The EPH was supervised and presided over by Shri B. Pani, I.A.S., Collector, Bhavnagar. He was assisted by Shri R.R. Vyas, Regional Officer, GPCB, Bhavnagar who was the representative of The Member Secretary, GPCB. Shri Vyas also acted as the Member Secretary of the Public Hearing Committee.

The EPH was attended by 69 members of the public. Nineteen questions were raised by eight different members of the public belonging to the study area. A total of twelve written representations were submitted by individual members of the public, associations and Non-Government Organizations (NGOs).

The querries covered pollution from ship-recycling and allied activities, provision of health care facilities and other amenities for workers, management of additional effluents & hazardous wastes expected to be generated from the expanded ship-recycling yard, sewage management from the workers' colony, economic viability of the upgradation & expansion project, employment generation (numbers and type of jobs), the status of the additional land earmarked for the upgradation & expansion project, source of water for the project, baseline environmental data generated for the EIA Report, CSR activities to be undertaken in the area, green belt development, clearance status of the TSDF site, emergency preparedness, possibility of destruction of mangroves, etc. Clarifications were sought on status of regulatory clearances, technical details of the project, technicalities of the baseline environmental data included in the EIA Report, responsibility for implementation of pollution control measures, status of accreditation of the consultant who had prepared the EIA/EMP Report (M/s MECON Ltd.) and the contents & structure of the EIA Report etc. Some submissions (both oral as well as written) were made for inclusion of some additional villages within Alang Notified Area.

GMB informed that baseline environmental conditions have been monitored by Central Salt and Marine Chemicals Research Institute and other institutes for the past 15 years and the results do not indicate pollution of ground water or damage to agriculture. GMB informed that a hospital with tertiary care facilities (including burns ward, trauma care etc.) for workers was coming up at Alang as part of the ongoing programme; Primary Health Centre will also be developed for workers. GMB explained that the upgradation project was necessary in order to adhere to international treaties / regulations and also to allow ships owners from OECD countries, who are presently constrained by their respective national regulations, to send their ships to Alang. GMB expects that the project will completed over the next 7 – 8 years and enable Alang to regain its market share by then. GMB informed that the upgradation project would come up only on GMB's land. GMB informed that the TSDF has received all necessary clearances from the concerned statutory authorities. All solid and liquid wastes will be collected and dispatched to this TSDF as is already being practised. As regards employment, GMB said that about 40000 to 50000 skilled and semi-skilled workers , not only from Gujarat but also from other states of the country would be directly employed at the project after being trained at GMB's Safety Training Institute at Alang. It is expected that 1.5 – 2 lakh people will get indirect employment. GMB informed that Rs. 150 Crores had been earmarked for improvement in safety and development of housing, health-care and other social amenities for workers. Clarifications on status of regulatory clearances, technical details of the project, technicalities of the baseline environmental data included in the EIA Report, responsibility for implementation of pollution control measures were provided to the members of the public both on the spot as well as in writing. GMB also said that the Draft EIA Report may be suitably modified would be made to address the issues raised by the public. As regards, inclusion of additional villages within Alang Notified Area, the Chairman of the Public Hearing Committee ruled that the matter was a revenue matter and outside the purview of the Environmental Public hearing. As regards Accreditation Status of the EIA Consultant (M/S MECON Ltd.), GMB informed that they had been informed MECON had not been issued any fresh accreditation certificate; they had only received a letter from NABET stating that their accreditation had been extended up to 2017. To prove that M/s MECON Ltd.'s accreditation to carry out EIA Studies for Ship Recycling Yards was valid, copy of the latest list of approved EIA Consultants for different sectors as published by Ministry of Environment Forest and Climate Change on its website, wherein MECON's name appears, was provided. GMB also stated that MECON had prepared the EIA Report as per the Ministry's guidelines.

Socio-Economic Impacts

Economy of the study area is dominated by industry. The proposed upgradation and expansion project is not going to cause any damage to the existing rural agrarian economy of the study area, instead it may help agriculture by way of providing supplementary income

which may result in increased investment in agriculture and consequently, agricultural production.

People have a tendency to allocate higher and higher amount of income on consumer goods. The project is expected to foster the existing trend of shift in the pattern of demand of the local people from food to non-food items as a result of the modernising influences.

The project has strong positive employment and income effects, both direct as well as indirect.

The project is going to create positive impact on consumption behaviour by way of raising average consumption level of the people of the study area and income through multiplier effect.

The project is likely to speed up the growing view on importance of education among the people of the study area.

Risk Assessment

Risk assessment has been carried out for the project. At Alang-Sosiya SRY ships' fuel (mostly furnace oil and small quantities of diesel) and lubricating oils are pumped out directly into road tankers and despatched to authorised recyclers and dealers. These oils do not catch fire easily. Nevertheless all basic safety precautions are enforced during oil handling to prevent any fires.

LPG is used for metal cutting. The LPG is supplied in 19 kg cylinders. Each plot has its own LPG godown for storing approximately 3 days' requirements i.e. maximum of 200 cylinders is stored on a plot.

It has been estimated that in case of a 20 mm rupture of an LPG cylinder, the entire quantity will be released in 40 seconds whereas if the rupture is of 10 mm, the cylinder will empty in about 3 minutes. In case of a release from a 20 mm rupture catching fire, person will develop heat blisters after about half a minute if he is standing 15 – 40 m away depending on atmospheric conditions. In case the cylinder explodes, window panes at a distance of about 100 m may shatter. In worst case scenario, oil storage tanks 79 m may rupture. The cylinder storage of adjacent plots will be more than 100 m away from each other. So this may not result in any chain reactions cause cylinders of adjacent blocks to explode.

Also, the probability of spontaneous failure of one LPG cylinder is about one in ten lakhs per year. The chance of leak / failure of one LPG cylinder is about five in twenty lakhs per year. Therefore the chances of simultaneous failure / leak of 2 or more cylinders are almost nil.

Furthermore, LPG cylinders are stored separately in designated godowns which have all necessary safety features. Efforts are made so that minimum number of LPG cylinders are stored at the site. In order to reduce the amount of damage from fire and explosion, the larger plots may have more than one LPG godown well away from each other. All workers

are indoctrinated that in case of any fire, whosoever notices the fire will sound the alarm and inform the shift-in-charge. The shift-in-charge informs security personnel and arranges to evacuate all personnel, except those who are required for fire fighting, from the area. Alang Fire-Station will be informed to deal with the emergency. The hospital will be informed to standby to handle casualties.

5.0 ENVIRONMENTAL MONITORING AND MANAGEMENT

GMB has an Environmental Cell at its Head Office manned by Environmental Engineers and Scientists. GMB has 10 dedicated Safety Officers at Alang to look after Health, Safety and Environment (HSE) matters. Manager (Planning) has been deputed as In-charge Director-Safety to impart health and safety related training to workers at the SRY. GEPIL, who operate and maintain the TSDF have their own dedicated HSE personnel. GMB arranges for accredited laboratories for undertaking environmental monitoring as and when required. However the environmental monitoring of the TSDF is carried out by the TSDF's own quality control laboratory. The resources of this laboratory may be augmented to carry out regular environmental monitoring for the entire yard.

6.0 BENEFITS OF THE PROJECT

The ship-recycling industry performs the vital function of recycling the materials used in the construction of ships which are no longer economical and safe to operate. Recycling avoids the pollution and land degradation which would have resulted from mining of raw materials and manufacturing the steel and other materials for constructing the ships. There are also massive savings in energy consumption.

Expanded Alang-Sosiya SRY will increase the availability of semi-finished steel for India's domestic steel industry. The project will generate additional direct as well as indirect employment.

The upgradation of the facilities at the yard will reduce pollution, improve safety and workers' living conditions. Hospital facilities for workers will be vastly improved. GMB and SRIA will continue to hold free medical camps for local villagers and undertake developmental projects in consultation with local villagers.

INTRODUCTION

1.0 INTRODUCTION

This is the EIA / EMP report for the proposed Upgradation and Expansion of Alang – Sosiya Ship Recycling Yard of Gujarat Maritime Board (GMB) located about 50 km from Bhavnagar city in Saurashtra Region of Gujarat. The upgradation has been designed to improve environmental performance of the yard, safety standards and workers living condition. The area and capacity of the existing yard will also be increased. The report has been prepared as per the procedure specified in Notification of Ministry of Environment, Forest and Climate Change (MoEF&CC) dated 14th September 2006 and subsequent amendments to the same.

1.1 PURPOSE OF THE REPORT

In pursuance of Government of India policy vide Environmental (Protection) Act, 1986 new projects or expansion of any existing project necessitates statutory prior environmental clearance in accordance with the objectives of National Environmental policy as approved by the Union Cabinet on 18th May, 2006 and MoEF&CC EIA Notification dated 14th September, 2006 by preparing Environmental Impact Assessment (EIA) report. In view of the above, the EIA report has been prepared for Environmental Clearance from MoEF&CC. The EIA/EMP report would facilitate related regulatory clearances as required, in addition to meeting GMB's requirements.

The objective of the EIA study report is to take stock of the prevailing quality of environment, to assess the impacts of proposed industrial activity on environment and to plan appropriate environmental control measures to minimise adverse impacts and to maximise beneficial impacts of the proposed project. The following major objectives have been considered:

- Assess the existing status of environment.
- Assess the impacts due to the proposed project.
- Suggest pollution control and ameliorative measures to minimise the impacts.
- Prepare an action plan for implementation of suggested ameliorative measures.
- Suggest a monitoring programme to assess the efficacy of the various adopted environmental control measures.
- Assess financial considerations for suggested environmental control plans.
- Clearances from statutory authorities

1.2 IDENTIFICATION OF THE PROJECT AND PROJECT PROPONENT

1.2.1 The project proponent

Gujarat Maritime Board (GMB); is a statutory organization of Government of Gujarat (GoG) established in 1982 under the Gujarat Maritime Board Act, 1981.

Gujarat Maritime Board (GMB) has established itself as maritime leader in port development, privatisation and specialised cargo handling in India. It is also the first maritime board of the country which was created up in 1982 with a vision "To enhance and harness ports and international trade as vehicles for economic development".

Since its inception, GMB institutionalised the concept of integrated port-led development of its minor ports, supported by last mile rail/road connectivity. This was effectively implemented by bringing right private partners through several pioneering models of privatization such as privatizing port services, private jetties, joint venture ports and greenfield ports etc. GMB has effectively implemented a unique business model, which has shown the pathway to growth and has successfully placed the non-major ports of Gujarat as benchmark for other states to follow.

GMB is the statutory body of State Government of Gujarat, which responsible for management, control and administration of 44 ports in Gujarat State. The ports under the jurisdiction of GMB are grouped into 10 ports (Bedi, Jafrabad, Navlakhi, Veraval, Bhavnagar, Magdalla, Okha, Dahej, Mandvi, and Porbandar Ports) and each of these groups is headed by the respective Port Officer.

The Board is the overall custodian for the world's largest Ship Recycling Yard located at Alang, about 50 km south of Bhavnagar in Saurashtra, Gujarat. Stretching over ~10 km of the coastline, at present there are 167 ship recycling plots that are leased out to private entrepreneurs for ship recycling activity. In operation since 1983, over 5500 vessels have been scrapped in yard, including warships, tankers and even oil rigs.

GMB has a separate department for Alang which is responsible for execution of Ship Breaking Rules and Regulations for facilitating ship recycling activities at Ship Recycling Yards at Alang and Sachana.

1.2.2 The project

Gujarat has a vast long coast line on its western boundary. This Sea coast is dotted with number of natural ports and good sea beaches suitable for various purposes including ship-recycling. Importance of ship-recycling as a potential source of raw material for re-rollers was recognized as early as in 1979, as a result of which import of ships for recycling was accelerated. In order to develop

the industry on a large scale in Gujarat, an emphasis was laid to examine various sites suitable for this activity. High tidal range, gentle seaward gradient and firm holding ground are basic parameters of the site for developing ship-recycling industry. A survey for ship recycling was carried out by Gujarat Maritime Board about three decades before when a few sites were identified for development of ship recycling industries in Gujarat. The western coast of Gulf of Khambat, near Alang Light House, possesses such necessary parameters and was, therefore selected for promoting ship recycling activities on a larger scale.

Initially, the development activities were taken up by Gujarat Industrial Development Corporation (GIDC) which were later on transferred to Gujarat Maritime Board (GMB) in 1981-82. Development activities were then geared up and the yard started functioning in February, 1983. The first vessel MV KOTA TEJONG was beached at Alang on 13th February, 1983. Since then, the yard has witnessed spectacular growth and today it has been emerged as one of the largest ship-recycling yards in the world.

The yard is stretched on approximately 10 km long sea front on the western coast of the Gulf of Khambat adjoining to Alang-Sosiya village. About 1252 hectare of land related to the recycling industry has been declared as Notified Area vide Government resolution dated: 07-02-2000.

Fig. 1.1: Location of the Project

The present project envisages improvement of existing ship recycling yard by setting up facilities for decontamination of ships prior to being beached for recycling, upgrading existing waste collection and disposal systems, upgrading safety standards, settting up new social infrastructure for workers as well

expanding the yard (from present ~400 ships per year to ~600 ships per year). At a meeting taken by the Principal Secretary to PM at PMO on 16.07.2014 and attended by representatives of the Ministry of Shipping and Ministry of Steel, Govt. of India it was decided to seek the financial assistance from the Govt. of Japan through Japan International Co-operation Agency (JICA) to modernize Alang Sosiya Ship Recycling Yard. It is expected that, with improvements in environmental performance, safety standards and workers' welfare, ship owners from Western Europe, North America and Japan will no longer be constrained by their respective National regulations from sending their ships to Alang-Sosiya.

1.3 THE PRESENT STUDY

GMB commissioned MECON Limited, a Government of India Undertaking under the Ministry of Steel, for carrying out environmental baseline data generation and preparation of EIA and EMP report for the proposed Upgradation and Expansion of the existing Alang – Sosiya Ship Recycling Yard in Bhavnagar District, Gujarat .

The Terms of Reference (ToR) have been prescribed during the 141st Meeting of the Expert Appraisal Committee for Infrastructure Development and Miscellaneous Projects and Coastal Regulation Zone of Ministry of Environment, Forest and Climate Change (MoEF&CC) held during 26th – 28th Nov., 2014 for preparation of EIA/EMP report for the proposed ship recycling facility vide letter no. 11-43/2014-IA.III dated 22nd Dec., 2014 which is enclosed as **Annexure 1.1.** However, GMB modified the original project proposal and again approached MoEF&CC. MoEF&CC approved the same ToR vide letter no. 11-43/2014-IA.III dated 6th Nov., 2015 (Copy enclosed as **Annexure 1.2)**.

The project proposal was examined by the Gujarat Coastal Zone Management Authority (GCZMA). GCZMA recommended that the project be accorded Coastal Regulation Zone (CRZ) Clearance vide their letter no. ENV–10–2016–99–E dated June 8, 2016 (Copy enclosed as **Annexure 1.3).**

1.4 BASELINE DATA GENERATION, FIELD STUDIES AND SECONDARY INFORMATION COLLECTION

This EIA/EMP report has been prepared on the basis of one full season baseline environmental data monitored during full summer season, 2015 covering three months (March, April and May). The baseline data generation, covering micro-meteorology, air quality, water quality, noise levels, soil quality, traffic density and socio-economic conditions was carried by M/s Mitra S. K Pvt. Ltd. and Environmental Engineering Laboratory of MECON Ltd., terrestrial ecology was studied by MECON Ltd. and marine ecology by Terracon Ecotech Pvt. Ltd. under

supervision of MECON Ltd. CRZ demarcation has been carried out by National Centre for Sustainable Coastal Management (NCSCM), Chennai.

The data includes micro-meteorological conditions, physical oceanographic data, ambient and work zone air quality, noise levels, water quality and soil quality. Site survey has been conducted for studying the flora and fauna, socio-economic conditions including public consultation, land use, etc. Additional information has also been collected from several State and Central Government agencies / departments pertaining to above. The collected data have been analysed in detail for identifying, predicting and evaluating the environmental impacts of the proposed project. The maximum anticipated impacts on environment are assessed and suitable environmental management plan has been suggested.

1.5 COVERAGE OF THE REPORT

This report contains information on the existing environment and evaluates the predicted environmental and socio-economic impacts of the upgraded and expanded ship recycling facility. A detailed coverage of background environmental quality, pollution sources, anticipated environmental impacts (including socio-economic impacts) and mitigation measures, environmental monitoring programme, additional studies, project benefits, environmental monitoring plan and all related aspects have been covered in this report.

The report including this introduction chapter includes:

- Project Description
- Description of the Environment
- Anticipated Environmental Impacts and Mitigation Measures
- Analysis of Alternatives
- Environmental Monitoring Programme
- Additional Studies
    - Public Consultation
    - Social Impact Assessment
    - Risk Assessment
    - Oil Spillage Contingency Plan
    - On-site Emergency Plan
- Project Benefits
- Administrative aspects of EMP implementation
- Summary and Conclusion
- Disclosure of Consultant

1.6 ACKNOWLEDGEMENT

MECON wishes to place on record its deep appreciation for the trust reposed in MECON by GMB and for the active interest and help extended by concerned GMB officials.

Annexure 1.1: Approved ToR

F.No.11-43/2014-IA.III
Government of India
Ministry of Environment, Forests & Climate Change
(IA.III Section)

Indira Paryavaran Bhawan,
Jor Bagh Road,
New Delhi - 110 003.

22nd.
Dated: December, 2014

To
The Deputy General Manager (Env),
M/s Gujarat Maritime Board,
Sector-10-A, "Chh" Road,
Opp Air Force Station,
Gandhinagar – 382010, Gujarat

Subject: Up-gradation of existing ship recycling yard at Alang Sosiya, Gujarat for undertaking safe and environmentally sound ship recycling operations by M/s Gujarat Maritime Board – ToR reg.

Sir,

This has reference to your letter No. GMB/Env/91/JICA/6224 dated 16.09.2014 forwarding along with application seeking for Terms of Reference for the aforesaid project under the Environment Impact Assessment Notification, 2006.

2. The proposal was considered by the EAC in its 141st meeting held on 26th – 28th November, 2014 and the proponent has informed that:

i. Alang is located on the Western part of Gulf of Cambay in South Gujarat (Latitude 21°15'-21°29' N; Longitude 72°5'-72°15' E).
ii. Stretching over 10 km of the coastline, extending about 100 m inland from the shore, the area is covered by the port limits of Talaja. At present there are 167 ship recycling plots that are leased out to private entrepreneurs.
iii. In operation since 1982, over 5500 vessels have been scrapped in the yard, including warships, tankers and even oil rigs.
iv. Ships are grounded/beached by their own propulsion in high tide.
v. After the beaching is completed, residual fuels are removed and gas free confirmed.
vi. Large hull blocks are cut by gas torch.
vii. Hull block cut will be pulled by winch and further cut to smaller sizes.
viii. Remaining hull will be towed to shore side by using winches.
ix. Hull steels and other materials are cut down to truck size or smaller size as required by the market
x. Main engines or other large equipment will be finally pulled up to the shore and lifted by utilizing cranes.
xi. All the regulatory requirements on ship recycling procedures such as Gas Free Certificate: Safe for entry and hot work certified by Department of Explosive (PESO), Inventory of Hazardous Waste on

board by Gujarat Pollution Control Board (GPCB), Ship Recycling Facility Management Plan (RFMP) and Ship Recycling Plan (SRP) by GMB etc, will be followed.

xii. Lightening: reduce weight by removing oil, equipment, furniture etc., prior to beaching to tidal amplitude for beaching.

xiii. Grounding and preparatory works

xiv. Before commencement of work, all tanks are decontaminated & checked by GPCB.

xv. Sludge is cleaned with sand and packed, transferred to TSDF with the control of manifest system

xvi. Asbestos is extracted by trained workers with PPEs, Scattering protection, packed in double sealed bags and transferred to TSDF.

xvii. Present up-gradation included (i) Pilot project to improve existing infrastructure in Alang area -impervious flooring for 70 plots (150 x 60 or 150 x 90 m) in Phase-I and remaining 97 in Phase-II, (ii) Dry Dock facility for the purpose of pre-cleaning of hazardous materials and wastes, (iii) Waste oil treatment system and Incinerator and (iv) Housing, Hospital facilities, community center, community school to be developed for welfare of labourer's working at the yard.

3. The Expert Appraisal Committee (EAC) has considered the proposal in its 141st meeting held on 26th – 28th November, 2014 and recommended for the TOR with the following specific TOR with general conditions for preparation of the Environment Impact Assessment (EIA) Report and Environment Management Plan (EMP) in respect of the **Up- gradation of existing ship recycling yard at Alang Sosiya, Gujarat for undertaking safe and environmentally sound ship recycling operations by M/s Gujarat Maritime Board:**

(i) Submit the details of the processes for each activity, generation of wastes, types quantity and methodology for collection, storage, treatment and disposal of wastes.

(ii) MoU with authorized agency for disposal of hazardous wastes if any be submitted,

(iii) Submit the detailed base line marine water quality vis-a-vis likely impact due to ship breaking and mitigation proposed.

(iv) Submit the details of personal prospective equipments (gas masks, dust masks, hand gloves, safety shoes, safety goggles, etc) for workers engaged for cutting, dismantling, isolation and segregation process.

(v) Submit the details of the reclamation along with the source of materials and its quantity & quality.

(vi) Submit the details of shore line changes along with the shore protection, if any required.

(vii) Details of Environmental Management Plan and Environmental Monitoring Plan with parameters and costs be submitted

(viii) Submit the details of Oil Spill Contingent Management Plan.

(ix) Submit the details of Risk Assessment, Disaster Management Plan including emergency evacuation during natural and man-made disaster like floods, cyclone, tsunami and earth quakes etc.

General Guidelines

(i) The EIA document shall be printed on both sides, as for as possible.

(ii) All documents should be properly indexed, page numbered.

(iii) Period/date of data collection should be clearly indicated.

(iv) Authenticated English translation of all material provided in Regional languages.

(v) The letter/application for EC should quote the MoEF&CC File No. and also attach a copy of the letter prescribing the TOR.

(vi) The copy of the letter received from the Ministry on the TOR prescribed for the project should be attached as an annexure to the final EIA-EMP Report.

(vii) The final EIA-EMP report submitted to the Ministry must incorporate the issues in TOR and that raised in Public Hearing. The index of the final EIA-EMP report, must indicate the specific chapter and page no. of the EIA-EMP Report where the specific TOR prescribed by Ministry and the issue raised in the P.H. have been incorporated. Questionnaire related to the project (posted on MoEF&CC website) with all sections duly filled in shall also be submitted at the time of applying for EC.

(viii) Grant of TOR does not mean grant of EC.

(ix) Grant of TOR/EC to the present project does not mean grant of approvals in other regulations such as the Forest (Conservation) Act 1980 or the Wildlife (Protection) Act, 1972.

(x) Grant of EC is also subject to Circulars issued under the EIA Notification 2006, which are available on the MoEF&CC website: www.envfor.nic.in.

(xi) The status of accreditation of the EIA consultant with NABET/QCI shall be specifically mentioned. The consultant shall certify that his accreditation is for the sector for which this EIA is prepared.

(xii) On the front page of EIA/EMP reports, the name of the consultant/consultancy firm along with their complete details including their accreditation, if any shall be indicated. The consultant while submitting the EIA/EMP report shall give an undertaking to the effect that the prescribed TORs (TOR proposed by the project proponent and additional TOR given by the MoEF) have been complied with and the data submitted is factually correct (Refer MoEF office memorandum dated 4th August, 2009).

(xiii) While submitting the EIA/EMP reports, the name of the experts associated with/involved in the preparation of these reports and the laboratories through which the samples have been got analysed should be stated in the report. It shall clearly be indicated whether these laboratories are approved under the Environment (Protection) Act, 1986 and the rules made there under (Please refer MoEF office memorandum dated 4th August, 2009). The project leader of the EIA study shall also be mentioned.

(xiv) All the TOR points as presented before the Expert Appraisal Committee (EAC) shall be covered.

4. A detailed draft EIA/EMP report should be prepared in terms of the above additional ToRs and should be submitted to the State Pollution Control Board for conduct of Public Hearing. Public Hearing to be conducted for the project in accordance with the provisions of Environmental Impact Assessment Notification, 2006 and the issues raised by the public should be addressed in the Environmental Management Plan. The Public Hearing should be conducted based on the ToR letter issued by the Ministry and not on the basis of Minutes of the Meeting available on the web-site.

5. You are required to submit the detailed final EIA/EMP prepared as per ToRs including issues raised during Public Hearing to the Ministry for considering the proposal for environmental clearance within 3 years as per the MoEF&CC O.M. No.J-11013/41/2006-IA-II(I) (P) dated 08.10.2014.

6. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India/National Accreditation Board of Education and Training (QCI/NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other Organization(s)/Laboratories including their status of approvals etc. vide notification of the MoEF dated 19.07.2013.

7. The prescribed ToRs would be valid for a period of three years for submission of the EIA/EMP Reports.

(Dr.Manoranjan Hota)
Director

Copy to
The Member Secretary, Gujarat State Pollution Control Board, Paryavaran Bhawan, Sector 10 A, Gandhinagar-382 010, Gujarat.

ToR_Alang_Shipyard

Page 4 of 4

Annexure 1.2: ToR Amendment Letter

F.No.11-43/2014-IA.III
Government of India
Ministry of Environment, Forest & Climate Change
(IA.III Section)

Indira Paryavaran Bhawan,
Jor Bagh Road,
New Delhi - 3

Dated: 6th November, 2015

To

The Deputy General Manager (Env),
Gujarat Maritime Board,
Sector-10-A, "Chh" Road,
Opp Air Force Station,
Gandhinagar – 10 (Gujarat)

ગુજરાત મેરીટાઈમ બોર્ડ
ગાંધીનગર.
આવક રજિ. નં. ૧૮૬૫ (૫)
તારીખ ૧૬/૧૧/૧૫

Sub: 'Upgradation of existing ship recycling yard' at Alang Sosiya (Gujarat) by Gujarat Maritime Board – Amendment in ToR - reg.

Sir,

This has reference to your application No. GMB/Env/91(c)/JICA/1843 dated 30.03.2015 submitted the above mentioned proposal to this Ministry for amendment in ToR granted vide F.No.11-43/2014–IA-III dated 22.12.2014.

2. The proposal for amendment in ToR granted for **'Upgradation of existing ship recycling yard' at Alang Sosiya, Gujarat for undertaking safe and environmentally sound ship recycling operations by Gujarat Maritime Board**, was considered by the Expert Appraisal Committee (EAC) in the Ministry for Infrastructure Development, Coastal Regulation Zone, Building/ Construction and Miscellaneous projects, in its 147th meeting held on 23rd – 24th April, 2015.

3. The details of the project, as per the documents submitted by the Project Proponents (PP), and also as informed during the above said EAC meeting, are reported to be as under:-

(i) Ministry of Environment, Forest & Climate Change (MoEFCC) granted ToR vide letter No.11-43/2014-IA-III dated 22.12.2014. According to said ToR, it was proposed that the project would have the following components:

a. Pilot project to improve existing infrastructure in Alang Area i.e. impervious flooring for 70 plots (150 x 60 or 150 x 90 m) in Phase-I and remaining 97 plots in Phase-II.
b. Dry Dock facility for the purpose of pre-cleaning of hazardous material and wastes
c. Waste oil treatment system and Incinerator
d. Labour Welfare Infrastructure- Housing, Hospital facilities, community centre, community school at the yard.

(ii) Now, it is proposed to include two additional components namely (i) Providing additional improved 15 Nos. of Ship Recycling Plots (size approx. 110 x 90 m) southward to last Ship Recycling Plot at Alang and (ii) Hazardous

Material Removal pre-treatment facility (Dry Dock) of size of 400 x166 m including outer limits, which may be used for ship repairing and building when dry dock is not in use for decontamination. It is proposed to extend the ship recycling yard towards Southern Side from existing last plot at Alang by developing the above mentioned 15 plots and dry dock with the same dimensions. The development would be within 2 km stretch from the last plot of the yard.

(iii) GMB requested to issue same TOR for undertaking EIA for the above mentioned components in existing proposal to upgrade the Ship Recycling yard.

4. The EAC in its meeting held on 23rd – 24th April, 2015 has recommended for the same TOR to undertake EIA/EMP studies for the additional components to upgrade the Ship Recycling Yard. Based on the recommendations of the EAC, the Ministry of Environment, Forest & Climate Change hereby accords amendment in the Terms of Reference granted vide letter dated 22nd December, 2014, so as to include the additional scope in existing project to upgrade the Ship Recycling Yard.

5. All other conditions stipulated in the ToR issued vide letter No.11-43/2014-IA-III dated 22.12.2014, shall remain unchanged.

6/11/2015

(S.K. Srivastava)
Scientist E

Copy to:
The Chairman, Gujarat State Pollution Control Board, Paryavaran Bhawan, Sector 10 A, Gandhinagar-10

Amend_ToR_Gujarat Maritime Board

Page 2 of 2

Annexure 1.3: Copy of GCZMA's Recommendation

GOVERNMENT OF GUJARAT
FORESTS & ENVIRONMENT DEPARTMENT
BLOCK NO. 14, 8TH FLOOR, SACHIVALAYA
GANDHINAGAR - 382 010.

HARDIK SHAH, IAS
DIRECTOR (ENVIRONMENT) &
MEMBER SECRETARY, GCZMA

Ph : (079) 23251062
Fax : (079) 23252156
E-mail direnv@gujarat.gov.in

Ref. No.ENV-10-2016-99-E ***June 8, 2016***

To,
Shri S.K.Srivastava
Additional Director(IA-III)
Ministry of Environment, Forests & Climate Change
Indira Paryavaran Bhavan, Jor Bugh,
Aliganj Road New Delhi - 110 003

Sub: CRZ clearance for proposed project for upgradation of existing Ship Recycling Yard for undertaking safe and environmentally sound ship recycling operation at Alang- Sosiya, Dist: Bhavnagar by Gujarat Maritime Board – regarding

Dear Sir,

The Gujarat Mari-time Board (GMB), vide its letter dated 22/12/2015 has approached this Department seeking the recommendation from the Gujarat Coastal Zone Management Authority for obtaining CRZ clearance from Ministry of Environment and Forests, GOI for proposed project for upgradation of existing Ship Recycling Yard for undertaking safe and environmentally sound shi recycling operation at Alang-Sosiya, Dist: Bhavnagar.

The Gujarat Maritime Board is operating world's largest ship recycling yard at Alang, stretching over 10 km of the coastline . At present there are 167 ship recycling plots that are leased out to private entrepreneurs. Since 1982, over more than 5500 vessels have been scrapped in the yards including warships, tankers and even oil rigs.

The GMB has proposed to upgrade the existing environmental infrastructure and operation thereof in safe and environmentally sound manner. The Gujarat Maritime Board has proposed following facilities as a part of this proposal

1. Improvement of existing infrastructure – including impervious flooring for 70 plots in phase –I and remaining plots are proposed to be upgrade in Phase-II),
2. Development of two dry docks facilities for the purpose of pre-cleaning of hazardous material and wastes. Both the dry docks are proposed to be used for

not only decontamination of ships but also may be used for ship building /ship repairing purpose to implement the 3R's concept.

3. Development of 15 new Ship Recycling plots between two dry docks.

The GMB has submitted following documents alongwith application:

1. Form-I as per CRZ Notification 2011
2. Prefeasibility report for project of upgradation of existing ship recycling yard
3. Various undertakings as per guidelines of this Department
4. CRZ maps dully superimposed for the proposed project prepared by the National Centre for Sustainable Coastal Management, Chennai (one of the agencies authorized by the MOEF&CC, GOI)
5. Environmental Impact Assessment report and Environment Management Plan prepared by the MECON Limited, Ranchi, Jharkhand

The MECON Limited in their Rapid EIA and EMP report has studied the Project Description (chapter 2), Description of Environment (chapter 3), Anticipated Environmental Impacts and Mitigation Measures (chapter 4), Analysis of alternatives (chapter 5), Environmental Monitoring Programme(chapter 6), Benefits of project(chapter 8), The MECON Limited has also included one chapter as Summary and Conclusion(chapter 10).

The main findings of the Marine EIA report prepared by the MECON Limited are summarized as follows:

i. The project will require additional ~20 ha of land. This land comprises of Sea beach just beyond the existing SRY and scrubland just beyond the beach. This land is owned by Gujarat Maritime Board. There is possibility of shore-line changes on account of expansion of the existing SRY. However in this case shoreline changes are unlikely to occur because, the existing Ship Recycling Yard has been in operation since the early 1980s and there have been no shoreline changes. The offshore dry-docks will be linked to shore by cause-ways to allow free movement of beach sand.

ii. At the proposed project it is expected that 6 Mt/yr of LDT will be handled. Thus based on the statistics and current scenario of waste generation, it is expected that ~14900 t/yr of hazardous wastes and ~1550 t/yr of MSW will be generated.

iii. Asbestos was widely used in construction and industry because of resistance to abrasion and corrosion, inert to acidic and alkaline solutions, stability at

high temperatures, poor electrical and thermal conductivity, non-combustible and strong yet flexible. Asbestos and ACM is found on ships in many types of materials. When ACM is deteriorated, crushed or otherwise disturbed, asbestos fibres break up into very fine fibres and are released to the environment by either dispersing in the air, floating on water or accumulating on the ground. Because asbestos fibres are small (0.1 – 10 microns long) and light, they easily become airborne and remain so for long periods. People working in asbestos laden air inhale the fibres Asbestos exposure during ship recycling can occur by Occupational exposure. Para occupational exposure and Neighborhood exposure.

iv. There are several types of lesions associated with asbestos inhalation – fibrosis, carcinoma and mesothelioma (cancer of mesothelial tissue e.g. pleura, peritoneum). Fibrosis is associated chronic industrial exposure to all forms for asbestos fibres. Usually 4 – 7 years chronic exposure is required to produce serious degree of fibrosis but the same can be hastened by smoking. Fibrosis causes persistent coughing, breathing trouble and impairs lung function; secondary problems can be fatal. In human beings asbestos has been known to cause cancer in lungs, pleura (outer covering of lungs) , peritoneum (lining of abdominal cavity) and even intestines. There is evidence to suggest that brief but intense asbestos inhalation can lead to mesothelioma after a latency period of up to 40 years. Asbestos inhalation causes lysis of red blood cells, cytotoxicity of pulmonary macrophages and stimulation of collagen synthesis. The Asbestos Convention, 1986 adopted by International Labour Organisation (ILO) aims to control the use of asbestos.

v. Although some countries are yet to ratify the convention and Russia is not a member of ILO many of the major ship-building countries have ratified the convention and use of asbestos on board ships has been / is being phased out. The new regulation in SOLAS Chapter II-1 (Construction – Structure, subdivision and stability, machinery and electrical installations) prohibits the new installation of materials which contain asbestos on all ships except for vanes used in rotary vane compressors and rotary vane vacuum pumps; watertight joints and linings used for the circulation of fluids when at high temperatures (in excess of 350oC) or pressure (in excess of 7 x 106 Pa), there

is a risk of fire, corrosion or toxicity; and Supple and flexible thermal insulation assemblies used for temperatures above 1000 C.

vi. Moreover, since use of steam propulsion in ships is now limited mostly to LNG carriers only, requirement of asbestos based thermal insulation has also reduced. Consequently, diminishing number of ships containing large quantities of asbestos are in operation or being scrapped. In the proposed project, all forms for asbestos inhalation will be reduced to well below the threshold limits by stringent measures.

vii. On each plot a dedicated trained Asbestos Removal Supervisor is appointed to oversee asbestos removal activities. A trained Asbestos Removal Supervisor may oversee asbestos removal work in more than one plot because not all ships contain asbestos.

viii. In Alang SRY, Class I (activities involving removal of thermal system [TSI] insulation and sprayed-on or trowelled-on or otherwise applied surfacing ACM or presumed ACM) , Class II (Activities involving removal of ACM which is neither TSI or surfacing ACM) and Class IV (activities to clean up dust, waste, and debris resulting from Classes I, II works) asbestos works are carried out.The first step involves identification of asbestos and ACM on board the ship. A thorough inspection of the ship is carried out to note the presence of asbestos and ACM. The survey covers identification, location and quantification of Friable ACM, Category I Non-friable ACM as well as Category II Non-friable ACM.

ix. Based on the location of asbestos and ACM on the ship, the Supervisor sets up regulated / containment areas and put up prominent and easily understood signs denoting them. Similar areas are put up on the plots as well for dismantling sub-assemblies containing asbestos

x. In the smaller plots it may not be possible to have permanent asbestos handling setup. For such places, mobile units are available for deployment on the concerned plots as and when required. Since asbestos and ACM are classified as Hazardous Wastes as per "Hazardous Wastes (Management, Handling and Trans boundary Movement) Rules, 2008" they shall be removed before Grant of Cutting Permission by Gujarat Pollution Control Board. The Supervisor regulates the entry and exit of workers to and from the asbestos

containment areas. The best operating practices to control asbestos emissions shall be adopted for removal and disposal of asbestos.

xi. The packaged ACWM is transported by dedicated marked tractor-trolleys to Alang TSDF. At Alang TSDF, the ACWM is dumped in a separate masonry pit in landfill for hazardous wastes. Layer of ACWM is further cemented over to ensure 100% immobilization.

xii. In the proposed project, PCB containing wastes expected to be generated are paint chips, engine oil, hydraulic fluids, damaged electrical cable insulation, damaged electrical components, rubber and plastics. PCB containing wastes are classified as "Hazardous" as per the provisions of the "Hazardous Wastes (Management, Handling and Trans boundary Movement) Rules, 2008

xiii. Engine oil and hydraulic fluids will be carefully collected and sold to authorized recyclers. Salvageable electrical equipment / components, which may contain PCBs to will be sold to authorized recyclers. Tarpaulin / plastic sheets will spread below the painted platings from where paint is to be stripped prior to cutting to collect the falling paint chips. These will then be packed and disposed off as hazardous wastes. Waste electrical cable insulation and electrical components which are unsalvageable, will also be treated as hazardous wastes and disposed off accordingly. The stringent measures will prevent release of PCBs into the environment from the proposed project.

xiv. Paint chips are likely to contain heavy metals such as lead, chromium, copper, zinc & aluminium, toxic additives to inhibit marine growth and PCBs. It may be noted that the "International Convention on the Control of Harmful Anti-fouling Systems on Ships" adopted on 5th Oct., 2001 and in force since 17th Sept., 2008 prohibits the application or reapplication of organotins compounds which act as biocides in antifouling systems or the ships "shall bear a coating that forms a barrier to such compounds leaching from the underlying non-compliant antifouling systems". Thus hardly any TBT containing wastes will be generated at the proposed project.

xv. Insulation from damaged electrical cables will be stripped in a designated area which will be marked accordingly. Similarly damaged electrical equipment, which may include PCB containing components will be dismantled in the designated area.All wastes, which may contain PCBs (e.g. damaged electrical cable insulation, capacitors etc.) will be segregated and

stored separately in labeled packages as specified in Rule 19 of the Hazardous Wastes (Management, Handling and Trans-boundary Movement), Rules, 2008.

xvi. The plot owners maintain records of generation and disposal of PCB wastes as specified in Rules 21 and 22 of the said Hazardous Wastes (Management, Handling and Trans-boundary Movement), Rules, 2008. The wastes are transported to Alang TSDF for hazardous wastes and disposed off as specified in Rules 20, 21 and 18 of the said rules, respectively.

xvii. Paint chips are likely to contain lead, chromium, zinc, copper and other heavy metals. Heavy duty canvas sheets may be spread below the surfaces which are to be stripped of paint prior to cutting to collect the falling paint chips. Decks where paint chips have fallen are cleaned and the debris picked up using vacuum cleaners. The paint chips are placed in leak proof labeled containers and stored in a designated place prior to being dispatched to Alang TSDF. In the proposed project, all necessary measures will be undertaken to prevent paint chips finding their way to the environment.

xviii. Alang-Sosiya SRY does not process nuclear powered ships. However workers are at risk of radiation exposure on account of working on ships contaminated with radioactivity (due to having carried nuclear weapons or any such devices) or handling instruments containing radio-active isotopes. Necessary administrative measures are in place to prevent radiological exposures to workers and the general public

xix. Other solid wastes which are generated are remnants of cargo, packaging material (wood, cardboard, paper), insulating material [Polyurethane foam rubber, Expanded Polystyrene (thermocol), plastics etc.], metal chips, contaminated soil etc. During gas cutting of ships' hulls, globs of molten steel are generated which are likely to fall on the beach. Asbestos sheets, which may have been recovered from ships, may be placed on the ground below the cutting line to collect the falling globs of molten metal. This will improve material recovery and reduce contamination of the beach. The collected metal may be sold off as melting scrap. All non-hazardous non-metallic materials are collected and stacked separately till they can be dispatched to Alang TSDF. In spite of best efforts, the sand of the beach may be contaminated by spillages of oil / oily sludge, paint debris etc. In such

cases, the contaminated sand will be scraped off and dispatched to Alang TSDF.

xx. The GMB has developed a dedicated TSDF for disposal of wastes generated from Alang Sosiya SRY. The TSDF is located within Alang Notified Area near Manar Village alongside SH-37. The TSDF includes a Effluent Treatment Plant (ETP), an

xxi. Incinerator and Landfills for hazardous wastes as well as municipal solid wastes (MSW). The TSDF has its own fleet of tractor-trolleys for transporting wastes from the ship-recycling plots to the TSDF site, weigh-bridge and quality control laboratory. GMB has contracted M/s Gujarat Enviro Protection and Infrastructure Limited (GEPIL) to operate the TSDF. The ETP has a capacity to treat 30 m3/day of oily waste waters from ships by physic-chemical and biological means. The ETP also treats leachates from the TSDF's landfills. Oily water is collected from the ships and transported by tankers or in drums to the ETP. Leachates from the landfills are pumped to the ETP site

xxii. "International Convention for the Control and Management of Ships' Ballast Water and Sediments" (BWM Convention) was adopted by International Maritime Organisation (IMO) on 13th Feb., 2004. The convention requires all ships to implement a Ballast Water and Sediments Management Plan. IMO has formulated a protocol which requires ships to change their ballast water in high seas with an efficiency of 95% volumetric exchange while transiting between ports. At the project necessary administrative measures will be taken to prevent the discharge of un-exchanged ballast water and oily ballast water and bilge water.

xxiii. At the expanded ship recycling yard, LPG will be used for gas cutting of ships @ 22000 t/yr. Other than CO2, NOx will be generated. The annual NOx generation has been estimated to be 87230 kg /yr (@ 86 g NOx/GJ) i.e. 290.77 kg/day. This will be generated at over a wide area (~12000 m x ~250 m). The adiabatic flame temperature of LPG is >1500oC. Because of the high temperature of generation, the NOx, will disperse rapidly in the atmosphere. In addition the high prevailing wind speeds will further promote dispersion of the NOx. At the expanded project HSD will be used as fuel for material handling equipment and for material transport. The emissions from vehicles

will contain NOx. The NOx will be dispersed by the high prevailing wind speed. The high rate of dispersion will ensure that the NOx is rapidly diluted in the atmosphere. Nevertheless the dispersion of NOx generated on account of the proposed expansion of the SRY has been mathematically estimated by ISCST-3 model. The results indicate that the maximum ground level concentration of NOx due to the project is likely to occur within the project area itself. The ground level concentrations of NOx will be diluted to near back-ground levels within 1000 m of the project area.

xxiv. The nearby villages are at least 1 km the SRY. Thus at the nearby villages, there will be no increase in NOx levels on account of the proposed project Since the existing NOx levels are already very low, the resultant air quality will remain well within the norms.

xxv. Fugitive dust is generated due to handling of rusted steel plates on the beach and operation of trucks on road serving the project. Iron dust is hard and heavy. It does not spread beyond the ship recycling plots. As has been mentioned earlier, the pavement of the ship-recycling area will be concreted, which will greatly reduce fugitive dust generation. All the materials recovered during ship recycling are despatched by trucks. Fugitive dust is likely to be generated from the roads. However, the dust generation has be reduced by having wide metalled roads which is kept in good repair. The road running the length of the yard has been converted into a concrete road which has reduced fugitive dust generation.

xxvi. The existing noise level in the study area, as measured is 78 to 41.4 dB(A) during day time and 50.4 to 40.5 dB(A) at night. The major noise generating activity at the yard are operation of diesel powered material handling machinery, handling of large pieces of metal (some weighing several tonnes a piece) and trucks carrying away recovered materials. At present the number of truck plying on the road is 1216 / day. The increase in truck traffic will double (as at present the yard is operating at ~2.8 Mt/yr). This increase may increase the background noise levels by ~8 dB(A). Noise level is likely to increase in the project area as the project becomes fully operational. The noise levels of the diesel powered machinery which will operate at the yard are mostly 75 – 80 dB(A) at 10 m distance. In addition to noise generated by diesel powered machinery, noise will also be generated on account of

handling of metal. In the ship-recycling yard the personal exposure shall be less than 90 dB (A). From the estimation it can be observed that the activities at the proposed expansion area of project may marginally affect the ambient noise levels at the nearest villages in the study area. Those at a distance will not be affected.

xxvii. As indicated, expansion area of the project will be located mostly on barren lands and scrub lands . As regards impact on wildlife is concerned, most of the wild life in the project areas and its vicinity are confined to common small species, found on the outskirts of villages in most parts of India. The strong light in the project premises during night may cause disturbances to the fauna in the near by areas. It has been planned that all the light posts erected along the boundary of the project area will face inwards and down wards (with reflectors facing the project area and downwards), so that the light does not spread much outside the project boundary.

xxviii. The project area's marine bio-diversity is low. There is no large scale fishing activity. Hardly half a dozen or so fishing boats (all of them converted lifeboats salvaged from scrapped ships) are operating in the area. Due to implementation of stringent water pollution control measures, no untreated effluents or solid wastes will be discharged into the marine environment. Therefore marine flora and fauna will not be affected on this account.

The Technical Committee scrutinized the proposal of GMB in its 22nd meeting, which was held on 22-03-2016, wherein representative of GMB made a presentation about various activities to be carried out in the CRZ area, EIA report prepared by the MECON Limited , Ranchi , and CRZ map prepared by the National Centre for Sustainable Coastal Management, Chennai and Hydro-dynamic Modeling Studies carried out by the Indomer Coastal Hydraulics Pvt Ltd, Chennai Based on the presentation made by the representative of the GMB , it was decided by the Technical Committee to seek various details from the GMB _The GMB vide its lett18-04-2016 has submitted the details as asked by the Technical Committee

The representative of the GMB made a presentation before the GCZMA and submitted that the GMB has proposes to upgrade Ship Yards(70 plots) providing impervious floors to the plots during Phase-I and rest Plots will be covered under Phase-II for prevention of leachate of pollutants to sub soil/marine environment. Construction of Dock Yards(2 dry dock)(common facility for hazardous material removal from ships of

9

special concern e.g, tankers, insulated vessels etc) and development of 15 new plots between two dry dock.

There is also proposal of upgradation of existing waste management facilities for disposal of additional wastes generated from the above facilities, and labour welfare infrastructure facilities. These two components would be outside CRZ area

Upgradation of existing plots would include impervious concrete pavement, embankment of sheet piles(90 m X 60m) on the sea side of the concrete pavement, drain ditch would constructed at the edge of the concrete pavement , along side the sheet piles to capture oil and/or oily water and a pit of 1m X 1m X 2m to store oil and oily water, with oil skimmer of 1.1m X 2.7m X 1.15m to prevent oil escaping during heavy rain. 2 dry docks would be constructed(Approach Channel for each dry dock-1.25 km long, 0.25 km, wide, Capital dredging -1x106 M3 for each dry dock, maintenance dredging 0.1x106 M3, infrastructure for decontamination of ships and temporary storage facilities for offending materials) . Out of two dry dock, one would be set up at southern end of existing yard(**at 21^{0}23' 33.4''N, 72^0 09' 59.8''E**) and the 2nd would be set up at 2 km further south(**at 21^{0}21' 43.8''N, 72^0 09' 19.8''E**). Each dock will be 300m long , 50m wide and 11.5m high. Docks will be linked to shore by causeway constructed over box-culvert. It was further submitted that warships, passenger ship , passenger-cum RORO vessels of more than 20,000 LDT , tankers with more than 8m draft, ships which had carried International Maritime Dangerous Goods and Ships are containing toxic paints and oily residues will be dry docked for decontamination prior to beaching. This dry dock may use for repair & maintenance of operating ships , when it is not in use for ship recycling.

15 new plots (150m X 90m each) will be developed in the area between two dry docks. The existing road running the length of the yard will be extended to link the new plots. No private land will be acquired for the proposed plot and associated infrastructure. The new plots will have concrete floors sloped towards a drain for collecting run-off water. The plots have facilities for sorting and temporary storage of wastes and rest sheds with drinking water and toilet facilities for workers.

There is no National Parks, Biosphere Reserve, Tiger Reserve, Elephant Reserve , Sanctuaries, Reserved Forests, Marine National Parks within 15 km from the proposed site. There is no mangrove within project site. No coral Reefs, Archaeological/Heritage sites, within 15 km from project site. No Turtle nesting beaches/Horse-shoe Crab habitat, biologically active mudflats, sea grass beds within 5 km from the project site.

The Alang Sosiya shoreline has been stable since 1980. Institute of Ocean Management , Anna University has reported to Ministry of Environment, Forests and Climate Change, Government of India that shoreline changes at Alang Sosiya are less that 1m i.e insignificant change, Since method of working shall remain more or less the same, no shoreline changes is anticipated due to proposed project. Ballast water on ships will be exchanged in accordance with International Conventions prior to beaching to prevent introduction of harmful organisms to Indian coastal waters. All bilge water and effluents generated during cleaning of ships will be collected and transported by tankers to effluent treatment plant at TSDF for proper treatment. The pavement of the plots will be sloped towards a drain. The drain will be routed to a engineered settling pit provided with a oil & grease trap. Solid debris generated during cutting (especially paint chips, thermocol, poly-urethane foam, rubber, plastics) will be collected, segregated, packed and sent to TSDF for disposal. Dirty water generated from the TSDF's landfills and the pollution control systems of the incinerators will also be treated at the effluent treatment plant. Sewage generated at the workers housing colony will be treated in a sewage treatment plant. At plots sewage will be treated in soak pits. Treated water will be used for industrial purposes in the yard. Unused treated water will be discharged after quality checks.

As per the CRZ map prepared and duly imposed for the proposed route of pipeline, prepared by the NCSCM, Chennai, proposed activities fall in CRZ-I(B), CRZ-III and CRZ- IV categories.

The Gujarat Coastal Zone Management Authority deliberated the proposal of GMB in its 28th meeting, held on 22-04-2016 for expansion of the Alang Ship Recycling Facilities at Alang, Dist: Bhavnagar, after detailed discussion, it is decided to recommend to the Ministry of Environment, Forests and Climate Change, Government of India to grant CRZ Clearance for their proposed project for expansion of Ship Recycling Facility at Alang with following some specific conditions

In view of the above, if approved, we may seek the Government orders for recommending the Ministry of Environment, Forests and Climate Change, Government of India to accord environmental clearance under the CRZ notification, 2011, for the proposed project for upgradation of Ship Recycling Facility at Alang by the Gujarat Maritime Board with the strict compliance of the following conditions :

11

1. The provisions of the CRZ notification of 2011 shall be strictly adhered to by the GMB. Only permissible activities shall be carried out in CRZ area by the GMB.
2. ***The GMB Shall ensure that facilities will be developed in phase wise manner, so the GMB shall have to conduct Environmental Impact Assessment Studies before commencement of the developmental activities in next phase to ensure environmental improvement and / or sustainability of the region.***
3. ***The GMB shall ensure that there shall not be any discharge of effluent directly into sea. Oily waste shall be segregated and it shall be sent to common facility for incineration.***
4. ***The Dredged material shall be disposed of at a location based on scientific study to be done by the institute of National repute.***
5. ***All terms and conditions specified by the Hon'ble Supreme Court of India regarding Ship Recycling Shall have to be complied with by the GMB.***
6. All necessary permissions from different Government Departments / agencies shall be obtained by GMB before commencing the exploratory drilling at the proposed location
7. All the recommendations and suggestions given by the MECON Limited , in their Environment Impact Assessment report shall be implemented strictly by GMB.
8. The GMB shall exercise extra precautions to ensure the navigation safety and mitigation of the risk associated with the project activities especially due to collision, sinking or accidents of the vessels and would deploy the latest communication and navigation aids for this purpose.
9. The cost of the external agency that may be appointed by this department for supervision / monitoring of the project activities during construction/ operational phases shall be paid by GMB
10. The GMB shall contribute financially for any common study or project that may be proposed by this Department for environmental management / conservation / improvement for the Sea coast of the State.
11. The piling activities debris and any other type of waste shall not be discharged into the sea or creek or in the CRZ areas. The debris shall be removed from the site immediately after the piling activities are over.

12. The camps shall be located outside the CRZ area and the labour shall be provided with the necessary amenities, including sanitation, water supply and fuel and it shall be ensured that the environmental conditions are not deteriorated by the labours.
13. The GMB shall prepare and regularly update their Local Oil Spill Contingency and Disaster Management Plan in consonance with the National Oil Spill and Disaster Contingency Plan.
14. The GMB shall bear the cost of the external agency that may be appointed by this Department for supervision / monitoring of proposed activities and the environmental impacts of the proposed activities.
15. The groundwater shall not be tapped to meet with the water requirements in any case.
16. The GMB shall take up greenbelt development activities in consultation with the Gujarat Institute of Desert Ecology / Forest Department / Gujarat Ecology Commission.
17. The GMB shall have to contribute financially for taking up the socio-economic upliftment activities in this region in consultation with the Forests and Environment Department and the District Collector / District Development Officer.
18. A six monthly report on compliance of the conditions mentioned in this letter shall have to be furnished by GMB on a regular basis to this Department
19. The GMB shall ensure that the numbers of the Vessels and machinery deployed during marine construction, which are a source of low level organic and PHc pollution will be optimized to minimize risks of accidents involving these vessels.
20. The noise level during transport and construction of proposed facilities shall be kept minimum.
21. 21. The GMB shall carry out separate study for further erosion and deposition pattern in the area after dredging through a reputed agency and shall follow the suggestions of the study done by reputed agency ,for maintenance dredging, the recommendations/suggestions of the reputed agency shall be follow by the GMB.

22. Any other condition that may be stipulated by the Ministry of Environment, Forests and Climate Change, Government of India / this Department from time to time for environmental protection / management purpose shall also have to be complied with by GMB.

Thanking you

Yours sincerely,

(Hardik Shah).

Encl: As above

Copy to:

Shri Atul Sharma,
DGM, Gujarat Maritime Board,
Opp: Air Force Station,
Sector-10A
Gandhinagar --- For information please.

14

PROJECT DESCRIPTION

2.0 PROJECT DESCRIPTION

2.1 INTRODUCTION

Gujarat Maritime Board (GMB) proposes to upgrade and expand the existing Alang-Sosiya Ship Recycling Yard located in Talaja Tehsil of Bhavnagar District in Gujarat. The existing yard stretches over a length of ~10 km of coastline. The yard is divided into 167 plots which have been leased to private entrepreneurs for ship recycling. The existing yard has the capacity to recycle ~400 ships per year to recover ~4 million tonnes per year (Mt/yr) of various materials which include over 99% steel. The proposed upgradation and expansion project envisages:

a. **Upgradation of existing Ship recycling plots:** 70 plots in Phase I and remaining 97 plots in Phase II.
b. **Hazardous Material removal Pre-treatment Facility:** Constructing two nos. of dry-docks (each of dimension: l x b x h = 300 m x 50 m x 11.5 m) for pre-cleaning of hazardous materials from ships. Dry-dock 1 will be at the southern end of the existing yard and Dry-dock-2 about 2 km further south. Both the dry-docks may also be used for ship repair and ship building purposes when there are no ships for decontamination.
c. **Additional facilities:** (1) Waste oil treatment system. (2) Incinerator at the existing dedicated waste Treatment Storage and Disposal Facility (TSDF) site located within Alang Notified Area.
d. **Improvement of Labour Welfare Infrastructure:** Housing including hospital facilities, community centre and community school to be developed for welfare of labourers working at the yard (Total built-up area: ~94,700 m^2).
e. **Additional Plots:** 15 nos. 100 x 90 m plots between the two proposed dry-docks.

The expanded yard will be able to recycle ~600 ships per year and recover ~5.5 Mt/yr of materials.

2.2 TYPE OF PROJECT

The project falls under Category 'A' [Sl. No. 7(b) of Schedule: "List of projects or activities requiring prior environmental clearance"] of MoEFCC Notification dated 14th September, 2006 in connection with Environment (Protection) Rules, 1986.

2.3 NEED FOR THE PROJECT

The ship-recycling industry performs two critical roles:

1. It adjusts ship tonnage by way of disposing old ships whose operation and maintenance are no longer cost effective.
2. It recovers and recycles the materials used in construction of the ships.

As a ship gets old, its operational costs increase on account of increase in fuel consumption, requirements of spare parts and corrosion protection. Due to wear and tear during its operational life, the structural integrity of a ship is also compromised. After 20 – 25 years of operation, a ship becomes uneconomical and unsafe to operate. When a ship reaches this stage it becomes necessary to discontinue operating the ship and recover and recycle the materials used in its construction. The ship recycling industry performs this function. By recycling the construction materials and components, the demand for natural resources for producing the same materials is drastically reduced with consequent reduction in pollution and savings in energy consumption. **Table 2.1** gives the comparison of resource requirements between producing 4 million tones of steel by conventional route and that by the ship recycling route. **Table 2.2** shows the comparison in land requirement and waste generation between an actual 3.3 Mt/yr integrated steel plant and Alang-Sosiya SRY.

Table 2.1: Resource Requirements for Producing 4 Mt Steel by Conventional Route and By Ship-Recycling Route

Resource	Through Integrated Iron & Steel Route	Ship Recycling Route (including Re-rolling)
Iron Ore (t)	7,000,000	Nil
Refractory materials / additives (t)	2,800,000	Nil
Coal (t)	6,200,000	Nil
Process Chemicals (t)	160,000	Nil
Oxygen (Nm^3)	260×10^6	72×10^6
Water (Million m^3)	100 - 240	0.80
Fuel Oil (t)	120,000	220,000
LPG (t)	Nil	16,000
Energy (as fuel and electricity)	$80,000 \times 10^{12}$ J $	$80,000 \times 10^{12}$ J
$ Does not include energy required for transport of raw materials to plant site		
Sources: 1. *Report "Pollution Potential of Ship Breaking Activities" prepared by MECO Ltd. for CPCB in 2001* 2. *Technical Report No. 38 UNEP, 1997*		

Table 2.2: Comparison Between 3.3 Mt/yr Integrated Steel Plant and Alang-Sosiya SRY

Resource	3.3 Mt/yr Integrated Steel Plant	Alang-Sosiya SRY (400 ships; 4 Mt/yr)
Land Area (ha)	3460.7 #	~210
Land degradation for Mining of Major Raw Materials $	~20 ha /yr for coal + ~25 ha/yr (for iron ore) + ~8 ha/yr (for refractories	Nil
Annual Waste Generation at Mines $	~50 Mt (for coal) + ~3.6 Mt (for iron ore) + 0.8 Mt (for refractories)	-
Non-Hazardous Waste Generation at Plant (t/yr)	5733 *	10560 **
Hazardous Waste Generation at Plant (t/yr)	2333	770 **
# Plant Proper *Unutilised / Unsold wastes $ Indicative only as estimated from data of specific mines or specific groups of mines ** Actual waste generation from 394 ships		

The proposed upgradation project is aimed at improving the environmental performance of the yard, safety and social amenities for workers. These measures will attract ship-owners, especially those from Western Europe, Japan and North America to send their ships to Alang-Sosiya for recycling.

2.4 LOCATION AND ACCESSIBILITY

Alang-Sosiya Ship Recycling Yard is located on the western part of the Gulf of Khambat in Talaja Tehsil of Bhavnagar District of Gujarat. The existing yard is covered under Alang and Sosiya villages. The area is located between latitudes 21°22'36" N & 21°26'28.32" N and longitudes 72°10'00.4" E & 72°13'29.78" E. The length of coastline involved is about 10 km.

The proposed extension will be carried out on the southern side up to latitude 21°21'43.87" N and longitude 72°09'19.79" E. The additional area will come under village Mathavda. As mentioned above, it has been decided to construct 2 nos. dry-docks for decontamination of ships prior to recycling. Dry-dock 1 will be located at the southern end of the existing yard. Dry-dock 2 will be located about 2 km south of the existing yard and the intervening area will be utilized by developing additional ship-recycling plots. The reasons for selecting the sites have been discussed in Chapter 5.

Photo 2.a: Proposed Site of Dry-Dock 1 (Foreground) as in April, 2015

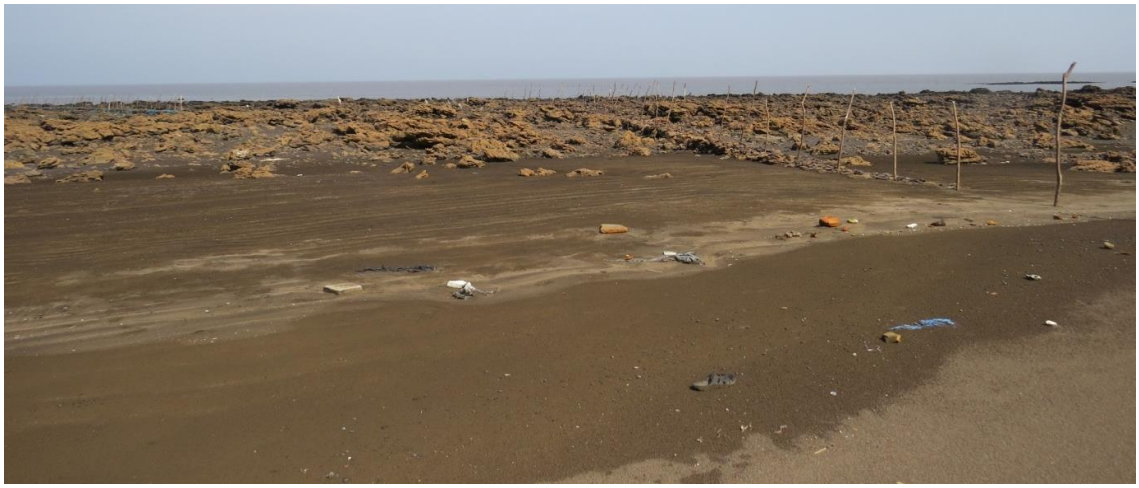


Photo 2.b: Proposed Site of Dry Dock 2 as in April, 2015

Photo 2.c: Proposed Site of Additional Ship-Recycling Plots as in April, 2015

Alang-Sosiya SRY can be approached from Bhavnagar by NH-8E via Trapaj. From Trapaj, SH-37 leads towards the yard. At Manar village a connecting road leads to central & southern part of the yard via Alang village. SH- 37 continues towards Sosiya village. At Sosiya village a connecting road leads to the northern part of the yard. A service road runs the entire length of the yard. All these roads are suitable for heavy vehicles.

The nearest railway station is at Bhavnagar (~50 km away). The nearest airport is also at Bhavnagar (~55 km away). The nearest all weather port is Bhavnagar (~50 km away).

The SRY has dedicated waste Treatment Storage and Disposal Facility (TSDF) in Manar Village within Alang Notified area along the side of the Manar-Alang Road. The TSDF is located between latitudes 21°24'45.9" N & 21°24'55.6" N and longitudes 72°09'31.4" E & 72°09'50.3" E.

A Google Earth image with the key locations marked is shown in **Drg. No. MEC/Q770/11/S2/01.**

2.5 SIZE AND MAGNITUDE OF OPERATION

2.5.1 Area

The existing ship recycling yard stretches over a length of 9.7 km of coastline. There are total 167 plots available for ship-recycling at present. 88 plots are located in Alang area (i.e. the southern part) while 79 plots are located in Sosiya area (i.e. the northern part). All the plots have an uniform length of 45 m. The widths of the plots vary from 30 m to 120 m.

It is proposed to develop 15 additional plots each of 100 m x 90 m between the proposed Dry Dock 1 located on the southern limit of the existing yard and the proposed Dry Dock 2.

2.5.2 Yard Capacity

The existing yard has the capacity to recycle ~400 ships per year to recover ~4 Mt/yr of various materials. **Table 2.3** gives the breaking statistics of the yard since inception.

Table 2.3: Breaking Statistics of Alang-Sosiya SRY Since Inception

Year	No. of Ships	Light Displacement Tonnage (LDT) in t
1982 - 83	5	24.716
1983 - 84	51	2,59,387
1984 – 85	42	2,28,237
1985 – 86	84	5,16,602
1986 – 87	61	3,95,139
1987 – 88	38	2,24,776
1988 – 89	48	2,53,991
1989 - 90	82	4,51,243

Year	No. of Ships	Light Displacement Tonnage (LDT) in t
1990 – 91	86	5,77,124
1991 – 92	104	5,63,568
1992 - 93	137	9,42,601
1993 - 94	175	1,256,077
1994 – 95	301	2,173,249
1995 – 96	183	1,252,809
1996 – 97	348	2,635,830
1997 – 98	347	2,452,019
1998 – 99	361	3,037,882
1999 - 2000	296	2,752,414
2000 - 01	295	1,934,825
2001 – 02	333	2,727,223
2002 – 03	300	2,424,522
2003 – 04	296	1,986,123
2004 – 05	196	9,38,975
2005 – 06	101	4,80,361
2006 – 07	136	7,60,800
2007 – 08	136	6,43,437
2008 - 09	264	1,944,162
2009 - 10	348	2,937,802
2010 – 11	357	2,816,231
2011 – 12	**415**	**3.853,879**
2012 – 13	394	3,847,566
2013 – 14	298	3,059,891
2014 - 15	275	2,490,152
2015 -16	249	2,431,752
April, 2016	30	2,98,838
TOTAL	**7170**	**54,976,782**

Alang-Sosiya SRY is not equipped to recycle submarines and nuclear powered ships.

2.5.3 Design Size of Vessels

Alang-Sosiya benefits from the natural advantage of having very high tidal variation of the order of 6 m. None of the current ship recycling yards in India have such a high natural tidal variation. The available natural tidal variation is capable of accepting Cape Size Vessels (80,000 – 175,000 DWT ships), which is a key advantage for Alang-Sosiya.

Alang-Sosiya SRY has the distinction of recycling the largest ship ship (by DWT) built so far [a 564763 DWT ULCC originally named "Seawise Giant" and subsequently as "Happy Giant", "Jahre Viking", "Knock Nevis", "Oppama"and finally "Mont"; LOA – 458.45 m; Beam – 68.8 m; Draft – 24.61 m; LDT – 81879 t) which was beached on 04 January, 2010.

2.5.4 Existing Infrastructure

A 10 km long 4 lane CC pavement service road suitable for handling heavy

vehicles runs all along the length of the yard linking the plots. This road is linked to SH-37 and NH-8E. The service road is linked to SH-37 towards Alang by a ~1.50 km long 4 – lane CC pavement road while towards Sosiya, a ~1.70 km long 2 – Lane asphalt road links to SH-37. Additionally two bridges are present, one across Manari River ~232 m in length and another across Pasvivali River which is ~230 m of length. These bridges have been strengthened and widened to cater to the traffic demands.

Water and electricity are supplied to each plot. There is a plan to enhance the power availability in each plot to facilitate the use of heavy electrical equipment for ship recycling. The yard is provided with telecommunication network (STD & ISD), post office, banking facilities, customs clearance facilities, police station and Fire Station. Weigh bridges, oxygen depot, crane depots, repair shops, provision stores, road-side dhabas and other shopping facilities are also available at the yard. Community Sanitation Complexes are present at 5 Locations.

There is a dedicated hazardous waste collection and treatment facility at Alang. Gujarat Enviro Protection and Infrastructure Ltd (GEPIL), is operating and maintaining this TSDF facility on behalf of GMB since October, 2005. The notified area for TDSF site is 7 ha. The TSDF has dedicated for land fill sites for asbestos and glass-wool, municipal wastes and other hazardous wastes. It has an incinerator of 5 t/day capacity. The TSDF also has a 30 m3/day capacity effluent treatment plant for treating oily waste waters from ships, leachates from the landfills and effluents generated from the incinerator's pollution control systems. The TSDF has its own fleet of tractor-trolleys for transporting wastes from the ship recycling plots to the TSDF.

Additional Infrastructure includes Fire Station with Fire Fighting Equipment & Vehicles, well established Training cum Welfare Complex, water works to supply water through pipe line, public toilet blocks (105 toilets + 73 bathrooms + 55 urinals for men and 15 toilets + 8 bathrooms for women), yard lighting & high mast towers etc. Additional public toilet blocks and a common truck parking facility are being constructed.

2.5.5 Regulatory Requirements

The entire procedure involves a series of steps requiring clearances from concerned stator authorities.

All ships entering the Indian Maritime Zone are required to inform the Maritime Rescue Co-ordination Centre (MRCC) and Indian Coast Guard that it is bound for ship recycling facilities. Subsequently the ship applies for anchoring permission, which is granted after desk review by the Port Authority / GMB / Customs. The permission for safe anchorage is given by the Port Authority in a such a way that during physical verifications of the ship by Gujarat Pollution Control Board (GPCB), Atomic Energy Regulatory Board (AERB), the Petroleum and Explosives Safety Organisation (PESO), Customs Department, Directorate of Industrial Safety and Health (DISH) and other concerned agencies and in the case of naval vessels by Indian Navy also. It may be noted that

since none of the Indian ship-recycling yards have the facilities for handling nuclear powered ships / vessels, no such ships / vessels are allowed into the country for recycling. In case a ship does not comply, according to the submitted documents, as per inspection by any or all of the agencies, the ship may be sent back.

Ship recycling is strictly monitored by various authorities as follows:

1. The seller / owner obtains permission from Customs Department and Port Authorities through their agents for entry of the ship to the port (Refer **Annexure 2.1**).
2. Beaching Permission from Customs.
3. Beaching Permission from Port (Refer **Annexure 2.2**). *[It may be noted that in Gujarat, this is granted only to those units which have valid allotment of plot and Authorization from GPCB.*]
4. Oil Removal Permission from GPCB.
5. Decontamination Certificate from GPCB. This is issued only after removal of oil and hazardous wastes including timber and wood.
6. Breaking Permission from Port Authorities. (Refer **Annexure 2.3**).
7. Naval Clearance from Atomic Energy Regulatory Board (AERB) in case of naval vessels.
8. Gas Free Certificate from Petroleum and Explosives Safety Organisation (PESO) for hot work in case of tankers and gas carriers.
9. Clearance from the AERB trained Radiological safety Officer (RSO) regarding instruments / devices containing radio-active isotopes.

The requirements to meet ISO and Supreme Court of India guidelines are as follows:

Table 2.4: Required Items to Comply with ISO and Supreme Court of India Directives

Requirements of Guidance under ISO and Supreme Court of India	**Status of Alang-Sosiya SRY**		**Compliance**
Management Level ISO 9001 ISO 14001 ISO 18001 (OHASAS) ISO 30000	 32 Plots 32 Plots 32 Plots 3 Plots		Not Applicable
Cutting Zone • Zoning • Impermeable floor, protection from HMs to drop • Flooring for machines and blocks • Protection from HMs falling to soil (flooring) • Surface structure and soil drain control	 Partial Partial Partial Partially steel plates Partial concrete surface	 No clear Zoning None at sea bed 2 plots partially paved with concrete	 Required Required Required Required Required

Requirements of Guidance under ISO and Supreme Court of India	Status of Alang-Sosiya SRY		Compliance
• Adequate fire extinguishers or fire water should be provided • Protection of piping for gas, oxygen, water & power lines etc.	Provided No fixed piping	Centralised fire-station provided	Improvement needed Protection required
Sorting & Storage of HMs • Consideration on asbestos storage	Partially provided stores by HMs	Less adequate facility and inadequate protection of workers	Safe removal required
• Consideration on TBT paint	Some remove paints as it is	No measures for bottom TBT paints	Safe removal required
• Ozone depleting substance		Removed by special handlers	Regulation required
• PCBs	No approved removal method.	No handler around	Regulation required
• Oil, PCB, TBT and other HMs, contaminated soil & water	Some change soil. Partly concrete paved .	No affirmative removal method	Required
• Surface structure of yard. Control of soil & drain (rain water)	Some plots changed surface soil	Soil drain control not enough	Required
• Contaminants, HMs should be protected from rain			Required
Equipment, Machines, Tools • Adequate Capacity, strength • Operation standard, manuals & O&M programme • Licensed operators, workers	Not Clear No Licensed for heavy equipment	Mostly 2nd Hand No specification with certificate Un-clear competence	Required Required Need clear certificate
Workers safety and hygiene • Clean area (sanitary facility, washing or showers) • Changing room • Changing room & showers for asbestos handling workers • Rest rooms, mess rooms	Some provided Some provided Some provided Provided		Required Required Required Required
Drinking Water	No fixed potable water supply		Required
Oil Treatment Facility • Oil, residual oil, waste water receiving facility • Oil, waste water treatment facility	Yes Yes		Needs augmentation Needs augmentation
Solid waste treatment	Incinerator		Needs augmentation
Solid Waste Disposal	TSDF	TSDF	Complied

2.5.6 Ship Recycling Procedure

Ship recycling can be carried out by several methods, which include beaching, berthing, dry-docking and lifting on to dry land over marine air bags or slip-way.

Beaching is the most common method and is widely used in most places in India (including Alang), Bangladesh and Pakistan. In the beaching method, the ships are grounded in the inter-tidal zone during high tides (i.e. beached). After partial lightening of the ship (by removal of water ballast), the ships are winched closer towards the shoreline. After removal of residual fuel oil, lubricants and easily dismantled / removable items, the ships are cut up vertically into large pieces using LPG-Oxygen torches. The large pieces, some weighing more than 100 t are winched onto dry land, where they are cut into marketable sizes and loaded on to trucks for despatch to buyers.

Ships are also broken up inside dry-docks. This method is most environment friendly but used only in special cases (such as nuclear powered ships, ships containing highly toxic residues).

Ships are also broken while berthed along quays (as is done at Khidderpur Docks, Kolkata). The ships are tied up along a quay and cut up while still afloat. The bottom ~1/4 of the hull is winched on to dry land for final breaking.

In the Air-Bag Method, the ship is hauled onto dry land over a slip-way made up of inflatable rubber air bags. The ship is cut up on dry land. In the slip-way method, the ship is winched on to dry land over a concrete / masonry slipway and cut up on dry land.

A detailed description of different methods of ship-recycling has been given in Chapter 5.

2.6 PROPOSED PROJECT

In order to improve the environmental performance of the existing ship-recycling yard, the following works have been envisaged:

(i) Upgradation of existing ship recycling plots
(ii) Hazardous material removal pre-treatment facility as dry docks
(iii) Additional environmental facility (waste oil treatment and incinerator plant)
(iv) Improvement of labour welfare infrastructure (housing, sanitation, water supply, hospital facilities, community centre, community school)
(v) Additional plots

Fig. 2.1 illustrates the linkage of each of the above items and the flow of products coming out of ship recycling.

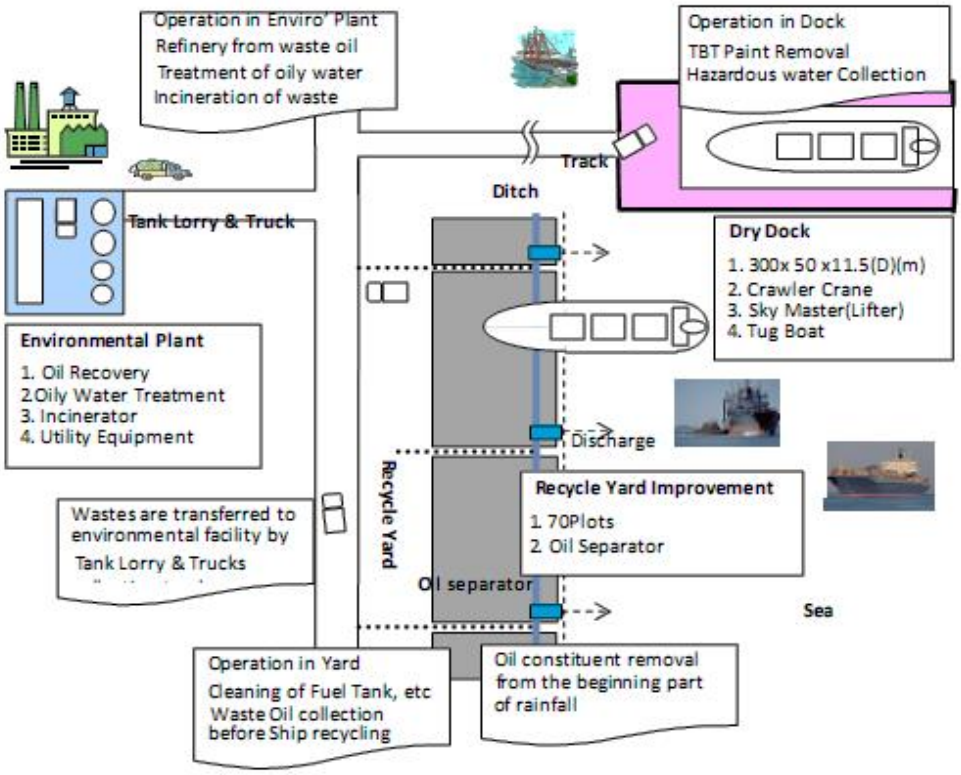


Fig. 2.1:Linkage of Ship Recycling Plot Improvement, Dry Docks and Waste Treatment & Disposal Facility

2.6.1 Dry Docks

Once a ship is beached, its engines have to be shut down. It may not be possible to provide power from a shore based source to run various pumps, motors, fans necessary for removal of offending materials present on board. Also it is not possible to remove and collect paint chips from the ship's bottom on the open beach which is submerged at regular intervals by tides. On the other hand, dry-docks have arrangements to supply electricity to dock ships from an external source after shutting down of the ship's main and auxiliary engines. Also any spillage of pollutants (solids or liquids) inside the dry-dock can be easily contained and collected for proper disposal.

Ships of Special Concern will be treated in the dry-docks prior to beaching. Naval vessels, Passenger or Passenger cum Roll-on / Roll-off (RORO) vessels of 20,000 LDT or more, Tankers (POL, Chemical), Floating Platforms for Offshore Oil & Gas Production and vessels having more than 8 m mean draft and requiring beaching 1.5 km or more from the shore and International Maritime Dangerous Goods (IMDG) carrying vessels shall be considered as "Ships of Special Concern". As has been mentioned earlier, Alang-Sosiya SRY does not have the infrastructure to handle submarines and nuclear powered ships; the proposed upgradation project does not envisage creation of facilities for handling such ships / vessels. Concurrently with decontamination, fuel tanks and oil

sumps will be emptied and cleaned. It is expected that decontamination of a dry-docked ship will require about five days. The cleaned ship will be undocked and head for beaching and recycling.

All wastes collected at the dry-docks (along with those collected from the ship recycling plots also) will be sent to the dedicated waste Treatment Storage and Disposal Facility (TSDF).

The project envisages construction of two dry-docks (along with necessary approach roads, power and water supply, fire fighting systems, rest rooms and toilets for workers and other necessary infrastructure) as a common pre-treatment facility for the purpose of removal of hazardous paint and pre-cleaning of for residual oil and other potential explosive / flammable gases prior to beaching for ships of special concern. The dry docks will be equipped with high pressure water jet instruments for removal of paint, washing facilities for cleaning of fuel tanks & oil sumps and cargo tanks of tankers and facilities for venting of suffocating and / or toxic gases.

2.6.1.1 Conceptual Dock Layout

After considering various options it has been decided to construct the two dry docks at a short distance offshore. Dry-dock I will be located just beyond the southern end of the existing yard; Dry-dock II will be located about 2 km further south. A drawing showing the Google Earth Image with the Dry Dock - I layout imposed is given as **Drg. No. MEC/Q770/11/S2/02**. Dry-dock II will have a similar layout.

The docks will be linked to the shore by causeways constructed over box culverts designed so as not to disrupt tidal currents. Normally tidal current flow follows the contours. The flow in the main part of Gulf of Khambat is north-south while mud flats get filled by lateral / secondary flow. The velocities of the secondary flow are very much less (of the order of ~10 cm/second). Hence any construction in the mud-flat area will not modify the shore-line in any way.

2.6.1.2 Design Vessel Size

The two dry-docks will be designed to handle ships of dimensions given in **Table 2.2.**

Table 2.2: Maximum Dimensions of Ships to be Accommodated in Dry Docks

DWT (t)	LOA (m)	LPP (m)	Beam (m)	Draft Ballast Loaded (m)	Max. Draft (m)
177,500	289	279	45	10.0	17.95

2.6.1.3 Dock Planning

Ships will be positioned inside the dock9s) with the following industrial space:

(a) Keel-block height : 1.2 m – 1.8 m
(b) Clearance over blocks : 0.6 m
(c) Length clearances at head end : 1.5 m – 3.0 m

(d) Length at outboard end : 4.6 m – 12.2 m
(e) Width clearance on each side : 3.0 m – 4.6 m.

The salient features of the proposed dry docks shall be as follows:

Length of Dock: The length should be about 6 – 10 m greater than the total length of the ship using the dock. The length clearance at the head of the dock should be 1.5 – 3.0 m and at the out-board end 4.6 m – 12.2 m. At the proposed docks the largest vessel will have an overall length of 289 m. Therefore, the overall length of the proposed dock shall be 300 m.

Width of dock: The width is established by taking the maximum width of the ship plus an allowance on each side for working. This allowance ranges from 3 m to 6 m on each side depending on the kind of dock, i.e. building or repair. In existing docks and docks under construction, the ratio of length to width is usually between 5 and 7. Accordingly, total width of 50.0 m has been provided keeping requisite provision for working.

Height of dock: In tidal harbours, the largest ships are usually docked during high tides. The level of high tide is taken and the choice of the design level is made according to this level. Because of the regularity of tides, the witing period for the correct water level is relatively short. Thus the lowest predicted High Water Neap Tides are used for design purposes. The depth of dry dock plays a crucial role as costs of building a dry dock are proportionate to the cube power of the increase in depth. It is helpful to make the floor level several mm above the assumed theoretical level in order to compensate for permanent settlement of the floor caused during flooding, especially during the first launching. **Table 2.4** shows the draft of ships during docking.

Table 2.4: Draft of Empty Ships

DWT (t)	Draft (m)
300,000	6.1
275,000	6
250,000	5.9
225,000	5.9
200,000	5.8
175,000	5.7
150,000	5.6
125,000	5.6
100,000	5.5
85,000	5.4
65,000	5.2
45,000	4.9
35,000	4.8
25,000	4.5
15,000	4.2

At the proposed docks, the largest vessel size is expected to be 177,000 DWT. The draft of an empty vessel of this size is expected to be ~5.7 m. The height of keel blocks which support empty ships in dry docks normally varies from 1.2 m to 1.8 m. Taking the

Mean High Water Spring (MHWS) level, empty draft of largest vessel, height of keel blocks into consideration, 11.5 m high dock wall has been envisaged.

Deck Elevation: The deck elevation of the coping of the dry dock wall is recommended to be high enough so that it will not be overtopped by severe waves which could possibly occur at high water. The MHWS at Alang is +7.80 m above CD . It is recommended to keep the deck elevation at +10.0 m above CD.

2.6.1.4 Navigational Aids

A. Buoyage : The most commonly used navigational aid used in any port is a system of floating markers known as buoyage system. There are several buoyage systems in vogue at various ports around the world. However, international organizations have been able to, by and large, standardize these systems. For dry docks and its approaches, Uniform International Lateral Buoyage System is envisaged. Starting from seaward, a "Landfall" buoy will be laid in deep i.e. about 10 m water depth. This buoy will be large, lighted and provided with radar reflectors or more advanced fittings to make it visible and / or discernible from a distance of not less than 3 to 5 nautical miles in clear visibility. Ships intending to call at the port will head for this buoy. Embarkation of pilots too may be done off this Landfall Buoy.

As a channel will be dredged from the seaward point where the natural depth is more than 2 m below Chart Datum (CD). This channel will have a bottom width of more than 250 m and a depth of 2 m below CD. Both edges of the channel will have side slopes of around 1:6. For convenience, the passage confined between the outer edges of the side slopes is termed as the Fairway. The entire Fairway will have to be properly marked by laying port hand and starboard hand channel marker buoys of the appropriate shape, colour, top-mark and light characteristics on both edges of the channel. However, a Fairway Buoy may laid a short distance seaward of the beginning (seaward) of the dredged channel. It is proposed that a gated pattern – in which port and starboard hand buoys are laid in pairs on the respective sides of the channel opposite one another – may be used for positioning of the channel buoys so as to provide the clear guidance to the pilots. Buoys may be laid on the outer edges of the fairway so that vessels will not be hindered by buoys in using the full 250 m width of the dredged channel. Gated pairs of buoys may be laid at intervals of 1 – 1.5 km in the straight sectors of the channel. It may be necessary to lay a shoal marker buoy at a location clear of the Sultanpur Shoal. This would be in addition to other buoyage mentioned above.

B. Shore Based Marks: Due to mobile status of buoys, implicit reliance cannot be placed on them for navigation. In this respect, shore based marks have more reliability and will be used wherever possible, either as supplements to buoyage or by themselves. A pair of Transit Marks will be constructed at suitable points on land to define the centre-line of each approach channel. The transit marks will be designed so that they are easily visible and lighted with suitable colours for night navigation.

A Sector Light may be installed at a suitable point on a appropriate structure to indicate the "Safe Zone" to the navigator in context of the offshore rock reef. The Sector Light should have two lighted sectors with one colour (red) for danger and another (white) to indicate the Safe Zone. Thus as long as the navigator stays in an area from where the red sector is not visible and the white is, he is assured of safety from the reef. Such Sector Lights are more fail-safe and are to be used in addition to the reef marker buoy.

C. Ship-to-ShoreCommunications: Efficient and reliable ship-to-shore communication is a basic need for smooth port operations. In the past this was achieved through visual means such as semaphores and flags hoisted on ships and signal masts on the shore. These systems still cater to dire emergencies and during failures of all modern systems, which are electrically powered. Accordingly, a signal mast complete with yard and halyards will be erected at a prominent location visible from ships in sight of the port. Full sets of flags and other types of hoists and visual storm and other signal shapes will be provided in suitable storages.

The Port Signal Station or Communication Centre will be equipped with modern, multi-channel radio communication systems for voice and signal communications with ships at, near or relatively distant from the dock(s). The Centre will be manned by qualified operating and maintenance staff. A proper E.T.A. Reporting System for ships, intending to call at the dock(s) shall be promulgated and enforced.

D. Pilot Service: Ships will be piloted inside the dry-docks by qualified pilots assisted by tugs. The tugs' captains will also be Masters License holders. The entire operation will be supervised by the Dock Master.

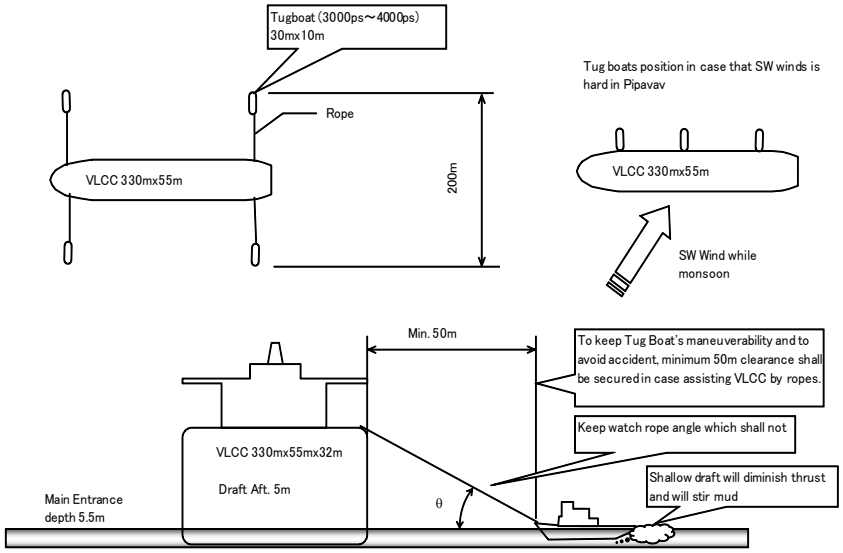


Fig. 2.2: Basic Position of Tug Boats

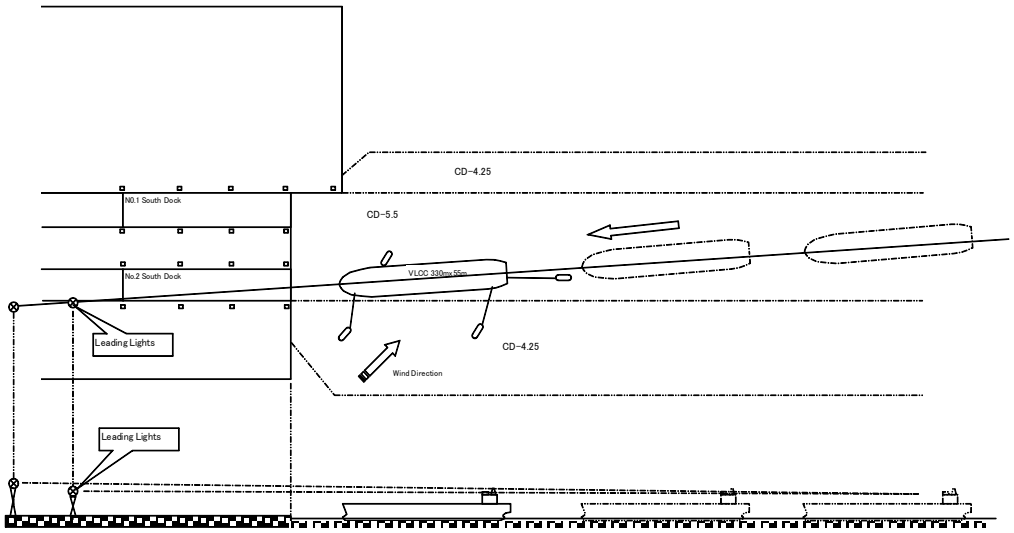


Fig. 2.3: Recommendable Route to Docks against SW Winds

2.6.1.5 Dredging Requirements

A major component in the pre-treatment facility is the approach causeway and a channel 1.35 km long, 250 m wide and dredged to –2 m CD. From the bathymetry, it is seen that -2 m depth is available at 1.7 km from shore involving considerable amount of dredging. The total quantity of dredging from each dry-dock works to about 1.00 million cubic metres (Mm^3). The dredge spoils will be mostly rocks, which will be used for construction of the dry-docks, roads and concrete paving of the ship-recycling plots. Maintenance dredging is usually taken as 10% of the capital dredging which works out to 0.10 Mm^3 for each dry-dock. The spoils of maintenance dredging will be dumped off-shore beyond the -20 m contour. Cutter-Suction Dredgers will be used for capital dredging because of its abilities to dredge a very wide range of materials by pumping with water directly to the disposal or reclamation area, to operate in shallow water and to produce a uniform level bottom with high rates of production.

The proposed dry docks may also be used for repair and maintenance of operational ships which are calling a nearby ports as well as for building of ships when the demand for their use for decontamination is low.

2.6.2 Improvement of Existing Recycling Yard

The basic design of ship-recycling plots include:

- Impermeable concrete pavement
- Embankment of sheet piles on the sea-side of the concrete pavement (90 m x 60 m)

- Drain ditch at the edge of the concrete pavement, along-side the sheet piles to capture oil and /or oily water and a pit of 1 m x 1 m x 2 m to store oil & oily water
- Oil skimmer of 1.1 m (w) x 2.7 m (l) x 1.15 m (d) to prevent oil escaping during heavy rain.

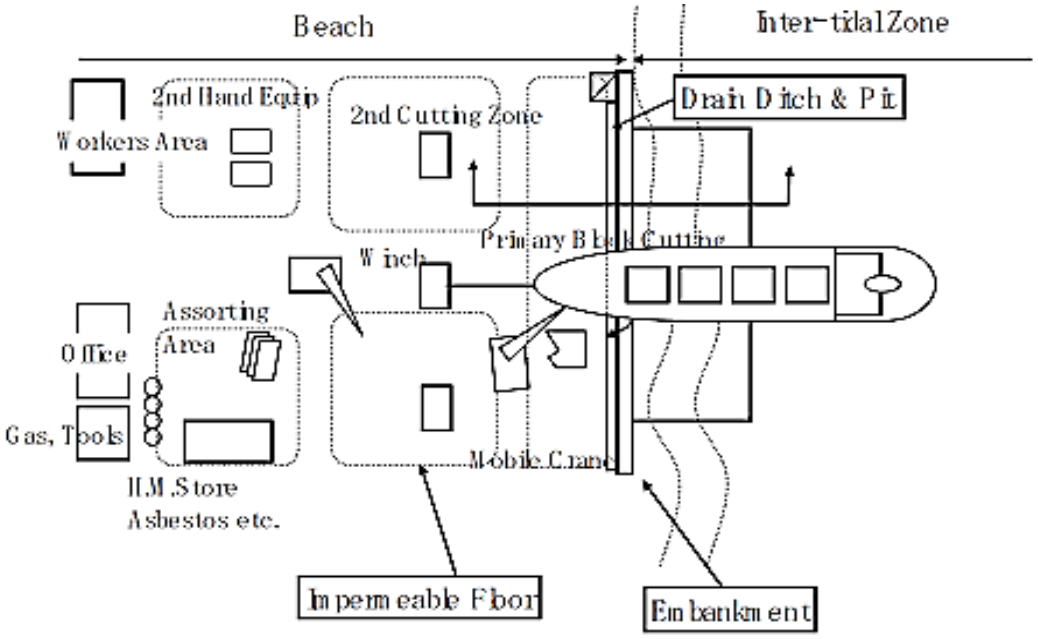


Fig. 2.4: Plan of Improvement of Existing Ship Recycling Yard

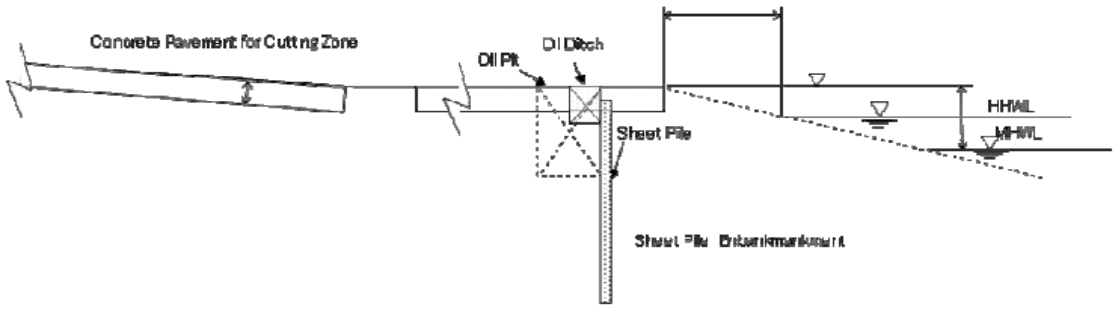


Fig. 2.5: Elevation of Improvement of Existing Ship Recycling Yard

These works will be carried out in two phases. In Phase I, 70 plots will be upgraded. The balance 97 plots will be upgraded in Phase II.

Some of the existing plots already have sloped concrete pavements (see **Photo 2.d**) with properly designed storm water drainage, enabling cleaner operations (see **Photo 2.e**).

Photo 2.d: Existing Ship Recycling Plot With Concrete Pavement

Photo 2.e: Well Maintained Ship Recycling Plot with Clean and Safe Operations

Oil Separator at Recycling Yard

Oily storm water will be treated by the oil separator installed at each recycling plot. Recovered oil and oily water from ships will be transferred to the Environmental Facility and clarified water including storm water will be discharged to the sea normally.

Ditch for collection of oil and oily water will be independent and not connected with other recyclers' ditches. Each plot will have its own separator.

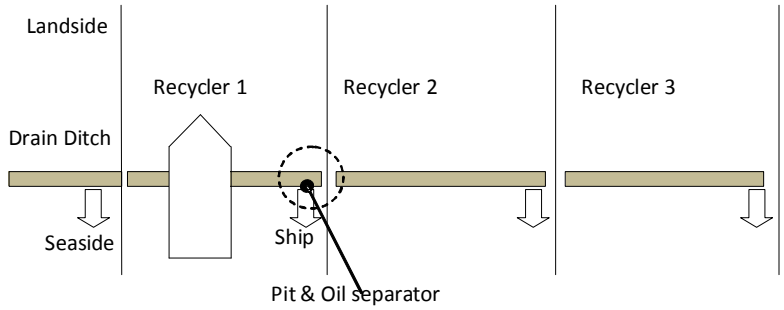


Fig. 2.6: Location of Pit & Oil Separator

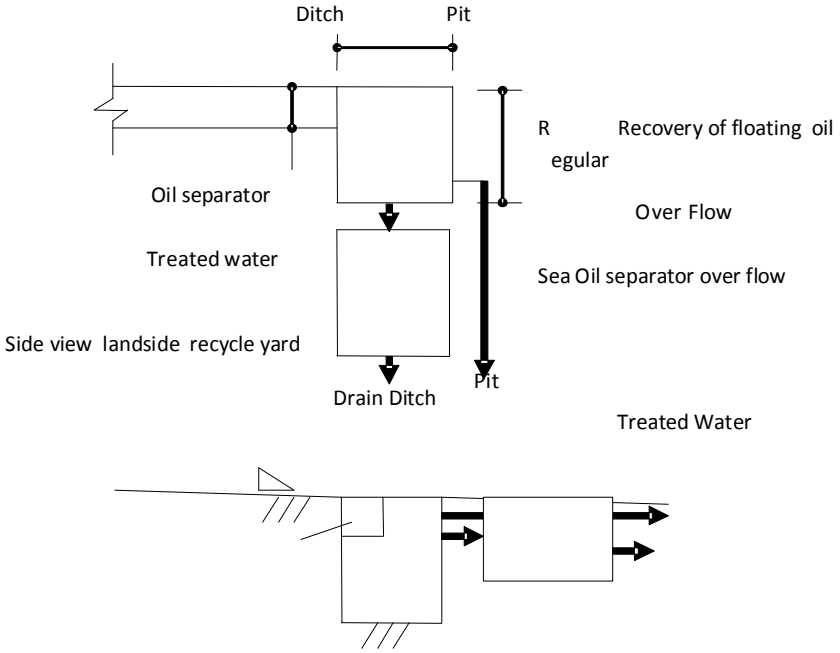


Fig. 2.7: Pit and Oil Separator Detail (Top View)

The proposed schematic layout of a typical modernized ship recycling plot is shown in **Drawing no. MEC/Q770/11/S2/03.**

2.6.3 Upgradation of Existing Hazardous Waste Management Facility at Alang

Presently, all wastes generated at the yard are sent to a dedicated waste Treatment, Storage and Disposal Facility (TSDF), spread over 7 ha, located near Manar village within Alang Notified Area. This TSDF has been set up by GMB. The TSDF site has been notified by Gujarat Pollution Control Board (GPCB) under the Hazardous Waste (Management and Handling) Rules, 1989 and Amendment, 2003. At present the TSDF has a 100,000 m^3 capacity landfill facility for hazardous and non-hazardous solid wastes, a 5 t/day capacity incinerator and a 30 m^3/capacity Effluent Treatment Plant (ETP) for treating oily waste waters. It is proposed to develop the following additional facilities at the existing TSDF:

1. A 25 t/day incinerator spread over 875 m^2
2. Oil Recovery and ETP capable of processing 30 m^3/day of effluents and recovering 4 m^3/hr of oil. This facility will be spread over 1400 m^2.

Drawing no. MEC/Q770/11/S2/04 shows the locations of existing and proposed facilities in the TSDF.

Fig. 2.8 shows the linkage of each of the following systems and their flow, which shall have to be accommodated in the existing TSDF:

1. Oil Recovery System
2. Oil Treatment System
3. Incinerator
4. Utilities

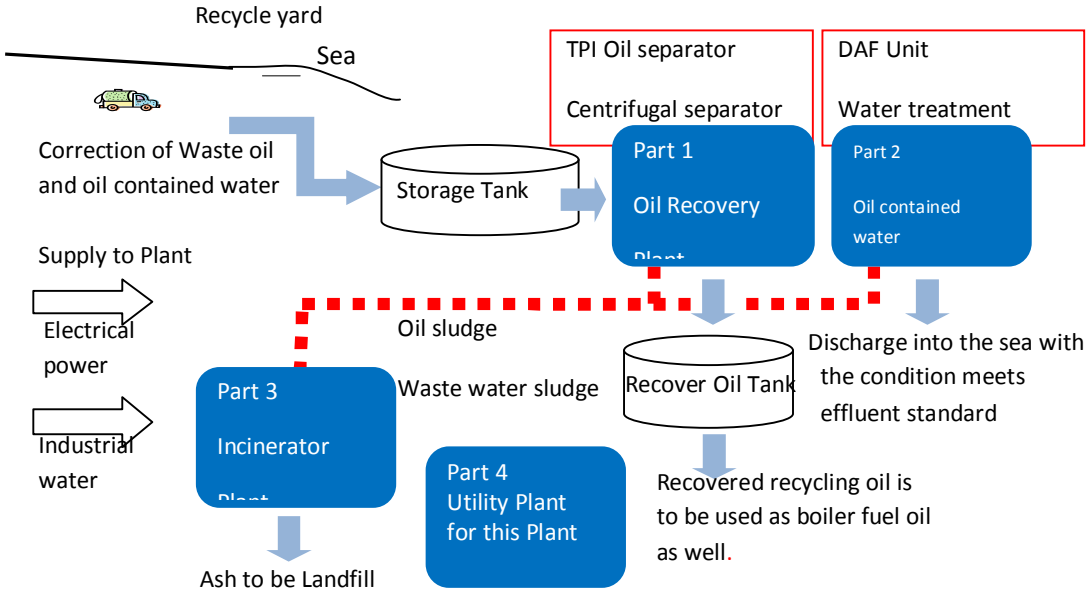


Fig. 2.8: Image of the Environmental Facility

Oily waste water from each plot, waste water generated from cleaning of fuel tanks & engine rooms, hazardous materials and oily water pumped out from ships at the dry dock(s) will be trucked to the environmental facility.

Oily waste waters will be pumped into receiving tanks at the ETP. Oil will collect at the top of the tanks will be recovered. Waste water at the middle layer of the tanks will be treated by oil treatment system and treated water will be discharged to the sea after quality checks. Oily sludge which will collect at the tanks' bottoms and oil sludge generated by oily water treatment system and other hazardous materials will be incinerated.

The TSDF has its own dedicated pollution control systems for the incinerator & landfills and fire fighting system

2.6.4 Labour Welfare Infrastructure

GMB has set up a Safety and Labour Welfare Institute in 2003 at alang. This institute looks after the training and safety needs of the SRY workers. It is now mandatory for all workers to undergo a 3-day pre-employment safety training course.

Alang has a Red Cross Mission Hospital having basic medical treatment facilities for workers and orthopaedic and burns ward. All the costs of treatment has to be borne by the plot owner where the injured worker is employed. However, this hospital's facilities are not entirely adequate for serious injuries. Comprehensive trauma facilities are available at Bhavnagar Civil Hospital in Bhavnagar city. Well equipped private hospitals are also available at Bhavnagar. Ambulances are available round the clock at Alang-Sosiya SRY for casualty evacuation.

Provisions for labour insurances are also made at Alang. Ship Recycling Industries Association (India) {SRIA}, the association of all the plot owmers operating at Alang-Sosiya SRY, and GMB act as watch dogs on the activity and compensation paid to workers.

Most of the workers reside in "kholi" type housing, which are shacks constructed with a wide variety of materials (bricks, corrugated asbestos sheets, sheets of ply-wood & fibre-glass, etc.), in surrounding areas. These do not have proper amenities. In order to provide proper housing and sanitation facilities, GMB in association with SRIA is constructing dormitory type housing facility for 1008 labourers in Phase I on GMB's land at a cost of Rs.20.29 crores.

In Phase I, it is planned to construct 7 residential blocks each with 3 floors (ground + 2), a canteen building, an office building, shops, roads, power supply, water supply and sanitary facilities with sewage treatment plant etc.. The buildings comprise of RCC framed structure, walls with "Autoclave Aerated Concrete" blocks, kota stone flooring in rooms, vitrified flooring in toilets, laminated doors with TW frame and aluminium section windows.

Photo 2.f(i): Under Construction Workers' Barracks as in April, 2015

Photo 2.f(ii): Under Construction Workers' Barracks as in Oct., 2015

It is planned to construct additional housing facilities for 6000 workers in phases along with a hospital with indoor facilities in the colony itself. It has been estimated that construction of housing facilities, canteen, power supply, water supply and sanitation and sewage treatment plant, hospital's dynamic expenses and landscaping (total built-up area0 80,000 m^2) will cost approximately Rs. one hundred and fifty crores.

The labourers of Alang area do not have any community centre, where they can organize their own social welfare and / or cultural activities.

It is planned to construct a Community Centre having capacity for 500 people. Members of the SRY's worker community may gather at this community centre for group activities, social support, public information and other purposes. They may also organize other functions such as celebration of various occasions and traditions, open meetings, social gatherings, volunteer activities etc.. Officials / political leaders may come to meet the workers and seek their views. Such community functions will definitely help the workers to prosper, flourish and endure. The Community Centre will have multi-purpose hall, gymnasium, indoor sports room, library, sanitation facilities, kitchen office etc. The total built-up area will be 1500 m^2; gardens, prayer ground / religious function area shall cover another m^2. The estimated cost of the Community Centre is Rs. Four Crores.

At present one Anganwadi (having about 50 children) and three schools are operational at Alang-Sosiya for children's education. At Alang, one school which

is up to 7th Standard has about 200 students. Another school, which is up to 5th standard, has about 150 students. The Sosiya side of the yard has a Swami Narayan Gurukul, which is up to 10th Standard, has about 600 students. But, looking at the expected flux of workers and proposed under construction housing facilities, it is apprehended that the existing education facilities will be insufficient. Therefore, it is proposed to construct a Primary School for 1000 children. The proposed school will have 20 nos. class-rooms, library, administrative office, common amenities such as hall, toilets, kitchen & canteen, indoor sports rooms etc. At this school, the medium of instruction is likely to be Hindi, as most of the children's parents will be from Hindi-speaking regions of the country. The built-up area will be 3200 $m^{2;}$ gardens and playground will cover another 10,000 m^2. The estimated cost of the school is Rs. Six Crores and fifty-lakhs.

Additionally 10,000 m^2 area will be used for parking, guard room and other infrastructure.

Fig. 2.9 shows an artist's conception of the proposed Community Centre.

Fig. 2.9: Artist's Concept of Proposed Community Centre

Fig. 2.10 shows the layout of the proposed Housing Colony.

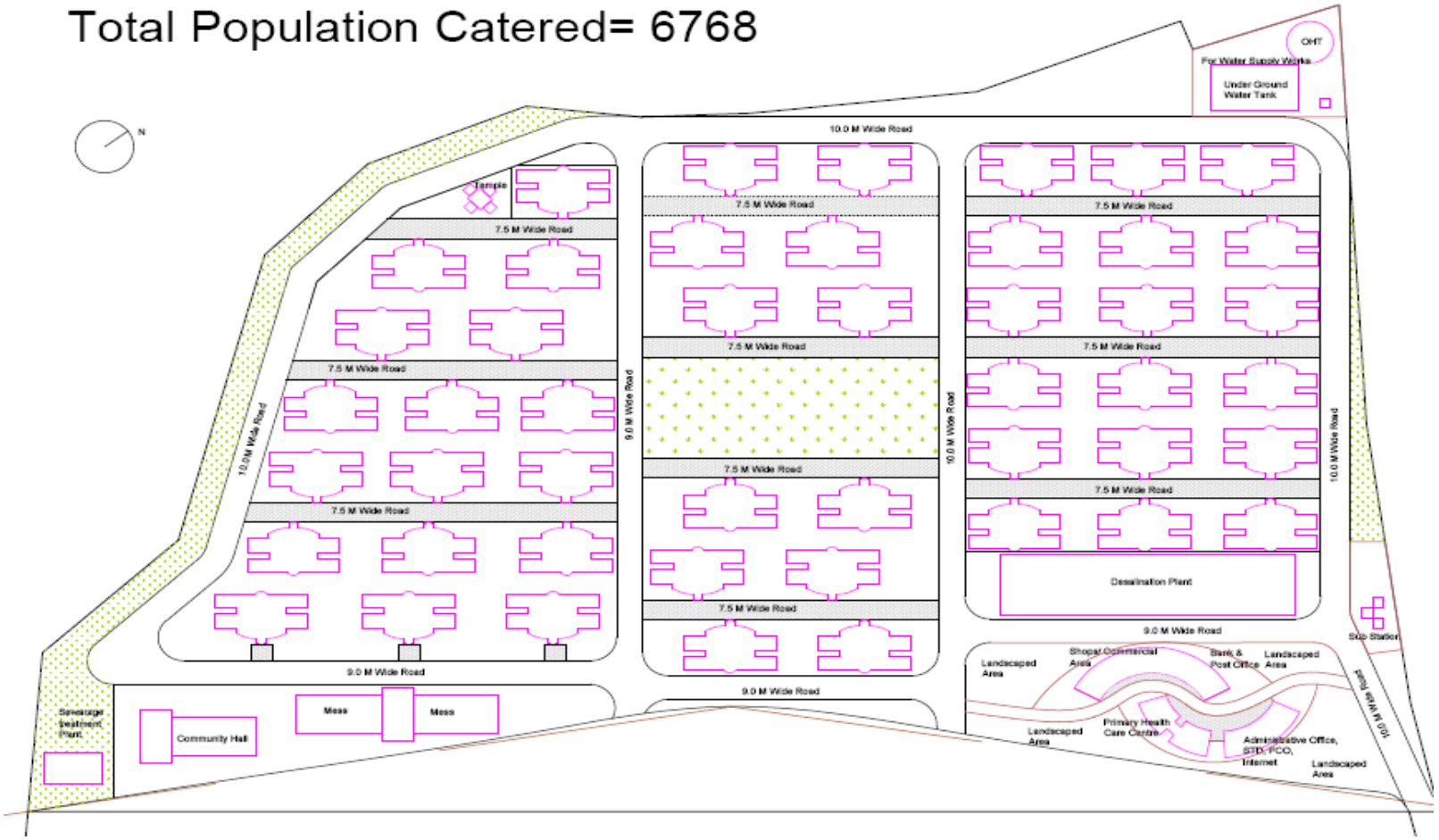


Fig. 2.10: Layout of Proposed Housing Colony

2.6.5 Design of the Project

The Designed Balance of material of the project is illustrated as **Fig. 2.11.**

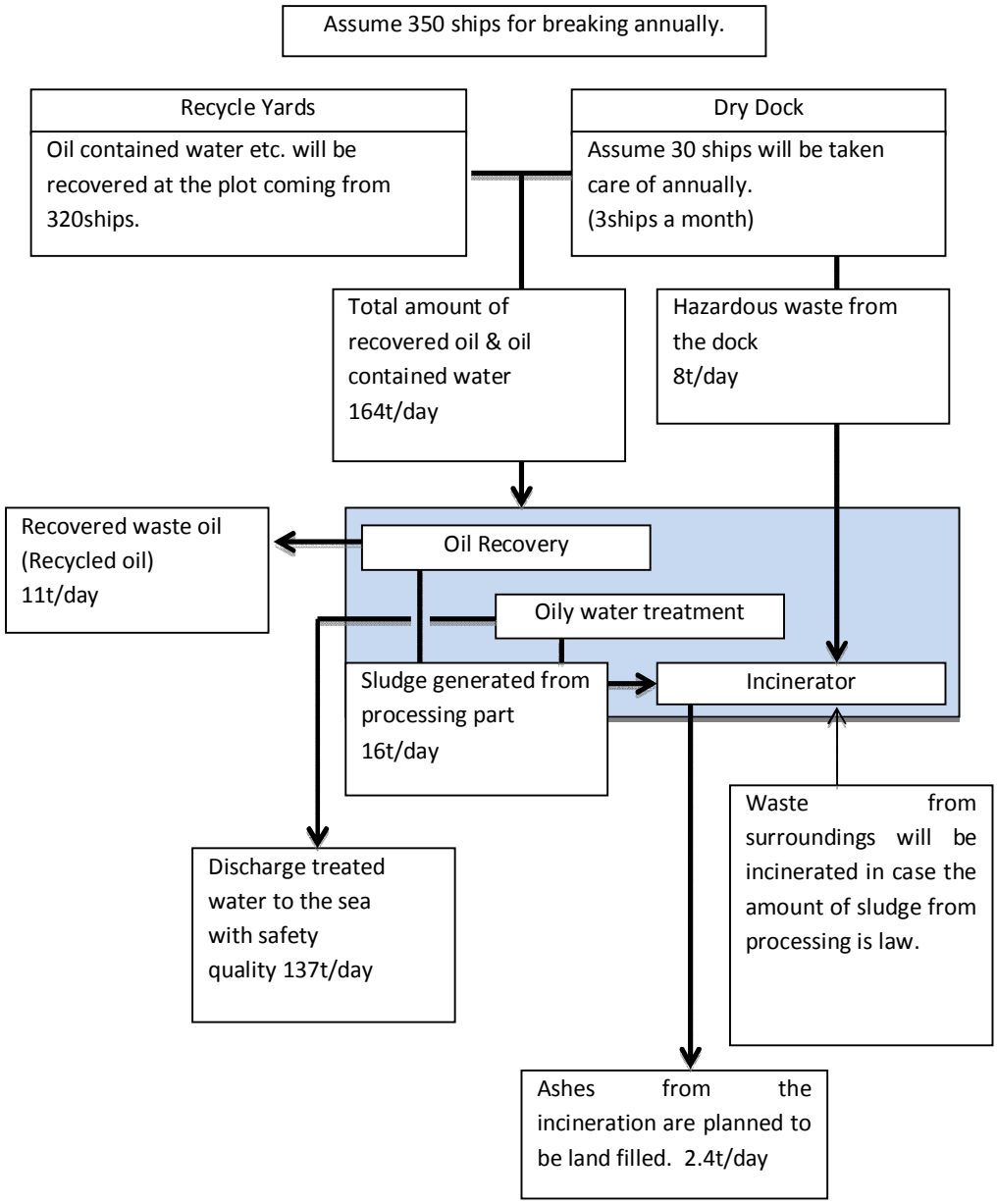


Fig. 2.11: Designed Balance of Material of the Project

2.6.6 Fuel Consumption

As mentioned above, LPG and Oxygen are required for cutting up ships and HSD is required for powering material handling equipment (cranes, winches, trucks etc.), water pumps etc. Light Diesel Oil (LDO) is used as start-up fuel for the incinerator at the TSDF.

The present LPG consumption of the ship-recycling yard (capacity ~4 Mt/yr) has been estimated to be 16000 t/yr. The LPG requirement for the expanded ship-recycling yard (~5.5 Mt/yr of material recovery) has been estimated to be 22000 t/yr. The LPG is supplied in 19 kg cyclinders. The plots with the highest productivity consume about 60 LPG cyclinders per day. The smaller plots require a maximum of 20 cyclinders per day. Each plot has its own LPG godown. Usually 3 days' requirements are stored.

The estimated oxygen requirement of the ship recycling yard is expected to increase from 72 x 106 Nm^3/yr to 99 x 106 Nm^3/yr. The oxygen is supplied in cylinders and stored in a separate oxygen cylinder godown on each plot. Some of the largest plots also receive liquid oxygen (LOX) which is stored in a special tank on the plot (see **Photo 2g**). From the LOX storage tank, oxygen is supplied through pipelines to metal cutting areas on the plot.

Photo 2g: LOX Storage Facility on Plot

The HSD consumption of the expanded yard has been estimated to be 2750 KL/yr. Only small quantities of HSD are stored on the plots for powering the static winches, pumps and DG sets. Fuel for mobile machinery is supplied in browsers as and when required.

LDO (start-up fuel for the TSDF's) consumption is 3.36 KL/yr at present. This is expected to increase to 7 KL/yr. The LDO is stored in a 20 KL capacity over-ground tank just outside the incinerator building.

2.6.7 Electricity Demand

Presently electricity is required only for illumination, running of office equipment, fans, air-conditioners, various domestic appliances and weigh-bridges on the plots.

The present peak electricity demand is 1.35 MW. This is expected to increase to 3 MW to meet the requirements of the two dry-docks (1 MW), the additional plots and the expanded TSDF (0.35 MW). The power is drawn from the grid. Emergency power is provided by DG sets.

2.6.8 Water

At the ship recycling yard water is required for dust supression, scrubbing of incinerator flue gases and for drinking.

Table 2.11: Water Demand for Alang-Sosiya SRY

Purpose	Peak Demand (m^3/day)
Industrial water	2000
Potable water	2400 (@ 60 l per capita)
Sub-Total	4400
Labour Colony Drinking Water	3750 (@ 75 l per capita)
Sub-Total	
TOTAL	**8150**

The water required for dust suppression on the plots is drawn from the sea. At the TSDF treated water from the ETP is used for dust suppression at the land-fills. Water required for the incinerator's flue gas scrubbing system is fresh water. The peak water demand for workers' use at the yard is expected to be 2400 m^3/day (@ 60 l/day per capita for 40,000 workers). At present 1000 m^3/day is being supplied through pipeline from Trapaj. The balance is supplied in tankers from bore-wells located well away from the coast.

2.7 MATERIAL TRANSPORT

Alang-Sosiya SRY does not have any rail linkage. All materials and personnel move by road. Some of the recovered materials are transported to trading establishments or material processing units located within Alang Notified Area by tractor trolleys or trucks. Wastes from the plots are sent to the TSDF in marked tractor-trolleys. Recovered materials are dispatched to buyers by trucks.

2.8 MANPOWER

When working at full capacity, the SRY directly employs about 40,000 workers. Most of these workers are migrant labourers mainly from Uttrar Pradesh, Bihar and Odisha. The indirect employment has been estimated to be about 500,000.

At all the plots, the workers have access to rest rooms / sheds with drinking water facilities and sanitary toilets. Special change rooms are provided to workers who need to put on special clothing for hazardous work (e.g. asbestos removal). First Aid Kits are available on all plots.

GMB's office at Alang has 68 persons at present to look after the functioning of the SRY. Another 29 vacancies are being filled. GMB has a fire-station at Alang, which is manned by 16 persons at present; another 17 vacancies are being filled.

ANNEXURE 2.1: DOCUMENTS TO BE SUBMITTED FOR OBTAINING PERMISSION FROM CUSTOMS AND PORT AUTHORITIES FOR ENTRY OF THE SHIP TO THE PORT

The agent of the seller submits the following information / documents to Customs and Port Authorities:

1. Name of the Ship.
2. IMO Identification number
3. Flag
4. Call Sign
5. Radio equipment list
6. Transshipment list.
7. Name of the Master (Captain) of the ship and his nationality.
8. List of crew, personal property list and ship currency list.
9. All crew passports / Continuous Discharge Certificate Book.
10. GRT / NRT / LDT of the ship with supporting documents
11. Copy of the Memorandum of Agreement (MOA) of the original seller and copy of the MOA between previous owner and cash buyer or Notarised Bill of Sale between the original owner and the cash buyer.

ANNEXURE 2.2: DOCUMENTS REQUIRED FOR BEACHING PERMISSION

1. Memorandum of Agreement between buyer and seller.
2. Application in prescribed proforma as per Annexure – I of Gujarat Maritime Board (GMB) regulation, 2003.
3. GMB paid Challan (in original).
4. Customs No Objection Certificate.
5. GPCB Authorization.
6. Arrival report.
7. Cargo Declaration.
8. Master certificate (Gas free, CO_2, No hazardous materials).
9. Survey Report.
10. Notice of Readiness.
11. Original Physical delivery Certificate.
12. GPCB Inventory.
13. In case of oil tankers, certificate from Explosives Department, Govt. of India for man entry / wet dry-dock.
14. In case of LPG / LNG Tanker or Chemical carrier, Certificate from Competent person under provisions of Petroleum Rules, 2002.
15. Ship Recycling Facility Management Plan (RFMP).
16. Ship recycling plot should also prepare the Ship Recycling Plan and have the same approved by GMB.

ANNEXURE 2.3: DOCUMENTS REQUIRED FOR CUTTING PERMISSION

1. Application in Prescribed Proforma as per Annexure – II of GMB Regulation, 2003.
2. Certificate for man entry into confined spaces as per Rule 68-H made under Sections 36, 41 & 112 of the Factories Act, 1948 issued by the Competent Authority.
3. Naked Light Certificate (Hot Work Certificate) as per Rule 68-H made under Sections 41 & 112 of the Factories Act, 1948 issued by the Competent Authority.
4. Certified Copy of the Authorization and Consent from GPCB for Ship Recycling Activity.
5. Registration as a member of Hazardous Waste Treatment, Storage and Disposal Facility (TSDF).
6. Decontamination Certificated from GPCB.
7. Gas Free Certificate from Master of Vessel.
8. Copy of Insurance Policy for workers engaged.
9. LPG Storage License, if applicable.
10. A copy of Beaching Permission.
11. Survey Report.
12. Oil sale Bill
13. In case of LPG / LNG tanker or Chemical Carrier, certificate from Competent Authority under the provisions of Petroleum Rules, 2002.
14. Destroyed / Removed Certificate of SOS Communication equipment etc. from Customs / Port Police.

DESCRIPTION OF THE ENVIRONMENT

3.0 DESCRIPTION OF THE ENVIRONMENT

3.1 PROJECT SITE AND STUDY AREA

The ship recycling facility including the proposed expansion area is designated as the project site. The area within 5 km radius of the project site is designated as the buffer zone. The project site and the buffer zone together constitute the study area. It may be noted that the "Technical EIA Guidance Manual for Ship Breaking Yards" commissioned by Ministry of Environment, Forest and Climate Change in 2010 indicates that the "study area shall be a distance of up to 5 km from the boundary of the proposed ship breaking yard". The study area is marked in **Drg. No. MEC/Q770/11/S2/05.**

3.2 ENVIRONMENTAL COMPONENTS AND METHODOLOGY

The environmental components studied and the methodologies followed for the preparation of EIA report are given in **Table 3.1.**

Table 3.1: Environmental Components and the Methodologies

Sl. No.	Area	Environmental Attributes	Parameters	Methodology
1	Project Area, Study Area	Air	- Micro-meteorology (Air temperature, wind speed & direction, relative humidity, rainfall)	Field Monitoring
			- Ambient Air Quality (PM_{10}, $PM_{2.5}$, CO, SO_2 , NO_x).	
			- Noise Levels	
2	Study Area	Water	Physical Oceanographic Characteristics Water Quality • Surface (parameters as per IS: 10500) • Ground (parameters as per IS: 10500) • Effluent (parameters as per General standards for discharge of environmental pollutants to marine coastal water as prescribed by MoEFCC)	Secondary Data Field Monitoring
3	Study Area	Soil	Soil Quality (Water holding capacity, texture, pH, Electrical Conductivity, NPK, micro-nutrients, Exchangeable cations,)	Field Monitoring
4	Study Area	Ecological Features	Flora & Fauna, including marine flora & fauna,	Field Study / Secondary Data
5	Study Area	Socio-economic Features	Parameters related to Socio-economic aspects (agricultural situation, employment, income, consumption and saving etc)	Field Study (Public Consultation by questionnaire survey) / Secondary Data
6	Interface of Study Area & Project Site	Infrastructure	Traffic Density	Field Monitoring
7	Study area	Land Use	Land use types	Land schedule records, satellite image processing

3.2.1 Study Period

Site monitoring has been carried out in Summer Season, 2015 for the period from 1st week of March to end of May to study the above mentioned environmental attributes. Sampling and analysis for ambient air quality, noise

levels, water quality and soil quality has been carried out by M/s Mitra S.K. Pvt. Ltd. , Kolkata, who have been accredited as per 17025-NABL, OHSAS 18001 – 2007, ISO 9001 - 2008 and recognized by MoEF&CC. Marine ecological studies have been carried out by M/s Terracon Ecotech Pvt. Ltd., Mumbai who are a NABET accredited EIA Consultant. In both cases the work was carried under the supervision of concerned NABET accredited Functional Area Experts of MECON Limited.

3.3 ENVIRONMENTAL SETTING

3.3.1 General Climate

The study area lies in tropical region where climate is characterised by very hot summers and mild winters. The Saurashtra area is a semi-arid region with weak and erratic rainfall confined largely to June-September period. The annual rainfall in district during 2009, 2010, 2011, 2012 and 2013 as reported by India Meteorological Department (IMD) are 373.1 mm, 790.0 mm, 573.6 mm, 381.5 mm and 933.2 mm, respectively.

The IMD observatory nearest to the project site is at Bhavnagar, about 40 km towards the north.

Summer is typically from March to June when temperature ranges from a mean daily maximum of 39.8°C to mean daily minimum of 19.5°C. Winter is from December to February when temperature ranges from a mean daily maximum of 30.7°C to mean daily minimum of 12.6°C. The mean annual rainfall is 668.7 mm (average of 32.0 rainy days per year). The South-west monsoon lasts from mid June to mid September and the area gets ~85% during this period. July is wettest month, with mean monthly rainfall of 180.5 mm (i.e. ~27% of annual rainfall; 9.8 rainy days).

As per IMD Bhavnagar records (Ref. Climatological Data Tables, 1952 – 1980; Published by IMD, 1999) the annual predominant wind directions are South-west, West and North-west, prevailing for 35%, 34% and 28% of the time respectively. During the Summer Season months the predominant wind directions are South, North-west and West, prevailing for ~20.5%, 16.3% and ~15.7% of the time respectively.

3.3.2 Sea Conditions

Shoreline Morphology

The part of the Alang coastline shows several interesting fore shore and back shore features. The fore shore features mainly comprise of:

- Wave cut platform
- Beach
- Mudflat

The inter-tidal platform which marks an erosional feature of wave action is seen as a very gently seaward sloping rocky plane. The platform is made up of laterite and lakhanka rocks. The width of this platform varies from 500 m to 1500 m. The platform is usually covered with a thin veneer of tidal mud. During the monsoons and immediately afterwards this mud is washed out. This platform is devoid of vegetation.

The beach runs the entire length of the coastline interrupted only by creeks. The width varies from 25 – 200 m. The beach slopes very gently seawards. Landward the beach is flanked by backshore dunes. The beach material varies in size from very fine sand to very coarse pebbly gravel. The grains comprise of quartz, agate, chalcedony, rock fragments and small proportions of shell material.

The backshore features comprise only of sand dunes.

Bathymetry

The bathymetry of the Gulf of Khambat is unique. From north to south and from east to west it shows striking depth variation. The gulf bottom comprises of a large number of shoals, under-water ridges and deep channels. Some of the ridges are seen to rise above the low water line. From the bathymetry point of view Gulf of Khambat can be divided into:

- Inner Gulf: North of Ghogha – Dahej (E-W line)
- Outer Gulf: Between Ghogha – Dahej and Gopnath-Surat (E-W line)
- Open Shelf outside the Gulf – south of Gopnath-Surat (E-W line) up to Daman

Alang is located in Outer Gulf. This part of the Gulf is deeper, broader and has varied floor topography. The Gulf floor is made up of underwater channels and ridges which tend to diverge and open up southward and some of the ridges rise above the low water line. The channels form the deeper areas in between the various parallel under-water ridges. The deepest portion of the gulf comprises of median channel as deep as 45 – 49 located to the east of Piram Island and three diverging channels in the southern portion just outside the mouth of the Gulf.

Tides

The tides at Alang are of mixed semi-diurnal type characterised by large tidal ranges. The tidal levels at Alang with respect to chart datum as reported in Naval Hydrographic Chart No. 2044 are as follows:

MHWS	:	+7.80 m
MHWN	:	+6.30 m
MSL	:	+4.70 m

MLWN : +3.00 m
MLWS : +1.60 m

High range between the highest high water tide and the lowest low water tide permits easy beaching of ships from the anchorage point to the shoreline.

Waves

The Gulf, by and large forms an area of low wave energy. Waves are generated generally by winds and the geographic locate of the gulf and its configuration is such that the gulf waters do not come under the direct influence of wind generated waves. Unlike the other coastal areas of Saurashtra and of South Gujarat which experience north westerly winds, the gulf is protected by the Saurashtra landmass. It is observed that the south-westerly winds generate relatively high amplitude waves in the open sea (outside the gulf mouth), but they reach the gulf coast after considerable refraction, thereby losing most of their energy. Due to the geographic feature of Alang/Sosiya area, high wave is reduced before reaching the coastline. By virtue of its location in the Gulf of Cambay, Alang ship recycling yard remains protected naturally against exposures to heavy sea waves during the monsoon period. Existence of Sultanpur shoal over 3 km distance in the EW direction and Molacca reef across the entrance of Gulf of Cambay also helps to break the strength of waves as they roll from the open Arabian Sea towards Alang coastline.

Current

Ocean current play an important role in the sediment transport process. Gulf of Khambat is well known for its swift currents. The currents generally flow parallel to the coast having magnitude up to 3.0-3.5 knots in directions 20° - 200° N. During monsoon the current is up to 12 knots and in other seasons it is up to 7 knots.

Cyclonic data and storm surge

The western coast of India is susceptible to severe cyclonic storm during SW monsoon period, especially in the month of May / June. The cyclonic storms originate in the Arabian Sea initially and move N or NW. The storms in the Arabian Sea have got frequency of 1/5th of those in Bay of Bengal. The storms are severe. These storms are not likely to cause a noticeable storm surge along the west coast. However a surge of about 0.5 m may be considered while planning & designing the marine structures like breakwater, Jetties, Groins and Quay etc.

Cyclonic disturbances strike North Gujarat, particularly the Kachchh and Saurashtra regions, periodically. These disturbances generally originate over

the Arabian Sea and sometimes in the Bay of Bengal. Generally during June, the storms are confined to the area north of 15°N and east of 65°E. In August, in the initial stages, they move along the northwest course and show a large latitudinal scatter. West of 80°E, the tracks tend to curve towards north. During October the direction of movement of a storm is to the west in the Arabian Sea. However, east of 70E some of the storms moves north-northwest and later recurve northeast to strike Gujarat-north Makran coast. Last cyclone that occurred in this region was in 1998. The intensity of that cyclone was more than 20 m/sec.

3.3.3 Physiography and Drainage

The project area (existing as well as proposed expansion area) is located on a stretch of beach, partly in the inter-tidal zone and partly above the High Tide Line.

The area within 5 km radius consists of flat and undulating expanses of sand, agricultural lands, barren lands, scrubs and creeks. To the northern part of the existing project area there are two tidal creeks, Manar and Pasvivali, which flow across the SRY to join the sea. The area beyond 5 km of the project site is also flat to gently undulating. Due to low and erratic rainfall, the natural vegetation is mostly of the xerophytic type.

There is no national park, biosphere reserve, sanctuary, archeological site, defense installation or airport within the study area. The area does not fall in a land slide prone zone. The area falls in Moderate Risk seismic zone as per IS 1893 (Zone III).

3.3.4 Land use

Land use in the study area

Existing land use in the study area has been studied through satellite image processing (IRS Satellite Data). Existing land use in the study area is shown in **Table 3.2.**

Table 3.2: Land use in 10 km Radius Area

Sl. No.	Land use category	Area (ha)	Percentage
1	Sea	14228.816	45.29
2	Agricultural Land	10953.328	34.87
3	Bandhara	6.054	0.02
4	Beach Ridge	54.799	0.17
5	Built-up Area	398.483	1.27
6	Canal	22.365	0.07
7	Creek	3.966	0.01
8	Dune without Vegetation	0.576	0.002
9	Eroded land	20.191	0.06
10	Horticulture (Orchards)	710.686	2.26
11	Industrial Area	174.399	0.56

Sl. No.	Land use category	Area (ha)	Percentage
12	Inter-tidal Mudflat	1402.385	4.46
13	Marshy area	56.848	0.18
14	Mining Sites	22.915	0.07
15	Ponds / Lakes	27.076	0.09
16	Port (Alang Sosiya SRY)	107.359	0.34
17	Reservoir	52.829	0.17
18	River / Streams	112.383	0.36
19	Salt Affected Lands	21.019	0.07
20	Scrub (Dense)	1161.150	3.70
21	Scrub (Sparse)	1502.432	4.78
22	Sparse Forest	347.262	1.11
23	Water Logged Area	28.605	0.09
	TOTAL	**31415.926**	**100**

The table shows that about 45% of the study area consists of sea. Dry Agricultural lands occupy ~37.1% of the study area. Scrub lands constitute ~8.5% of the study area. Inter-tidal mud flats occupy ~4.8% of the study area. The Ship Recycling Yard (SRY) is spread over ~107 ha (i.e. 0.34% of the study area). Industrial land (Waste salvaging, processing and trading areas linked to the SRY) occupy 0.56% of the study area. Land use coverage of the study area is shown in **Drg. No. MEC/Q770/11/S2/06.**

3.3.5 Shoreline Changes

Coastal changes are attracting more attention since they are the important environmental indicators that directly impact coastal economic development and land management. On the other hand, the instantaneous shoreline is an exact shoreline that represents the intersection between Instantaneous water surface and land at a specific time. Based on this, all shoreline representations that exist on images are instantaneous shorelines. The locations of the instantaneous shorelines for a specific area over a period of time are sometimes used to study shoreline change in that area.

In this study, the locations of instantaneous shorelines over a period of 9-years (IRS- ID, Year April 2000 & IRS-P6, year, 2008) have been used to analyse shoreline changes in the study area. The study showed minimal shoreline changes in this area. The shoreline where the Alang-Sosiya SRY is located is found to be stable and no changes in shoreline have been recorded since the last 8 years.

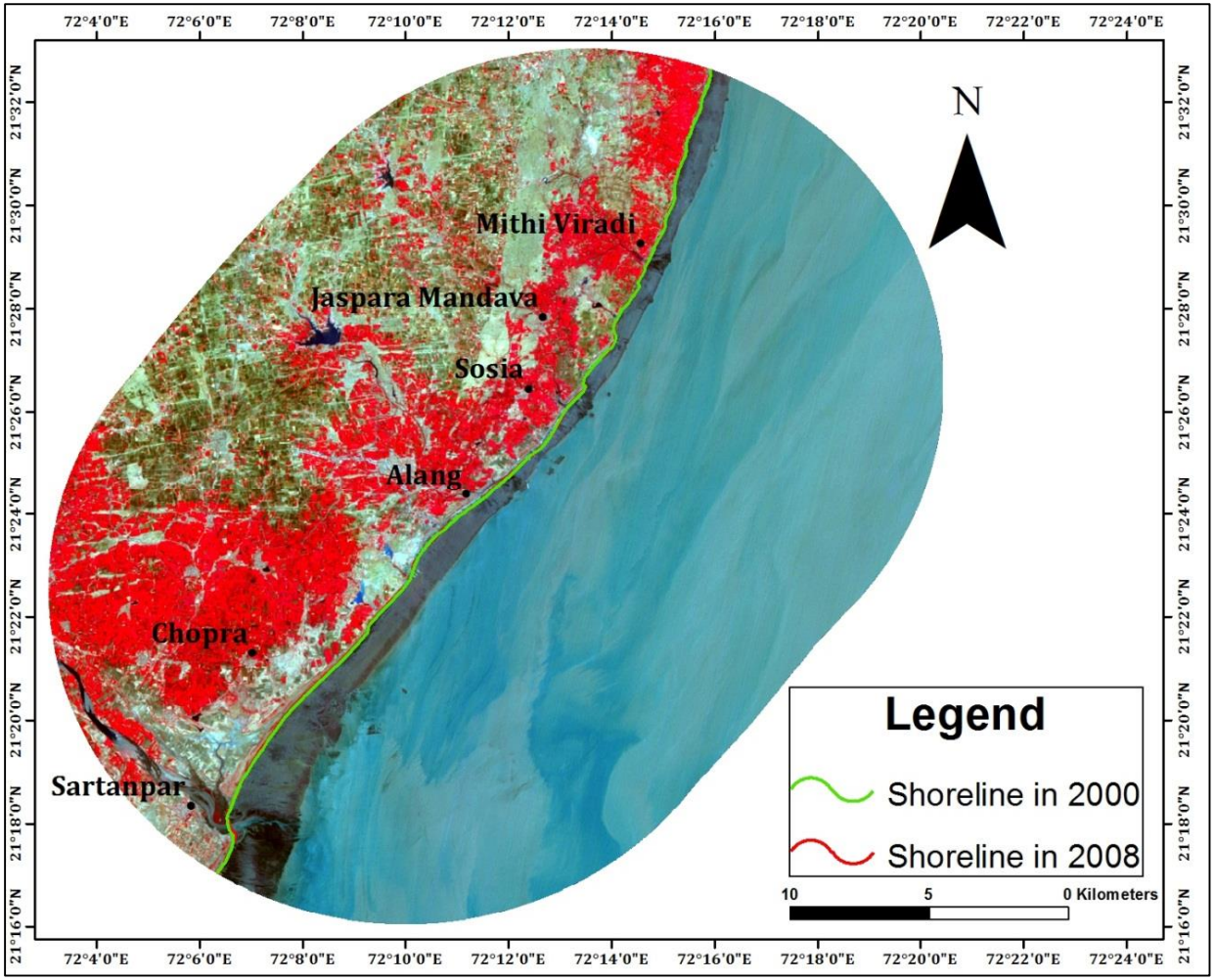


Fig. 3.1a: Shoreline Changes at Alang between 2000 and 2008

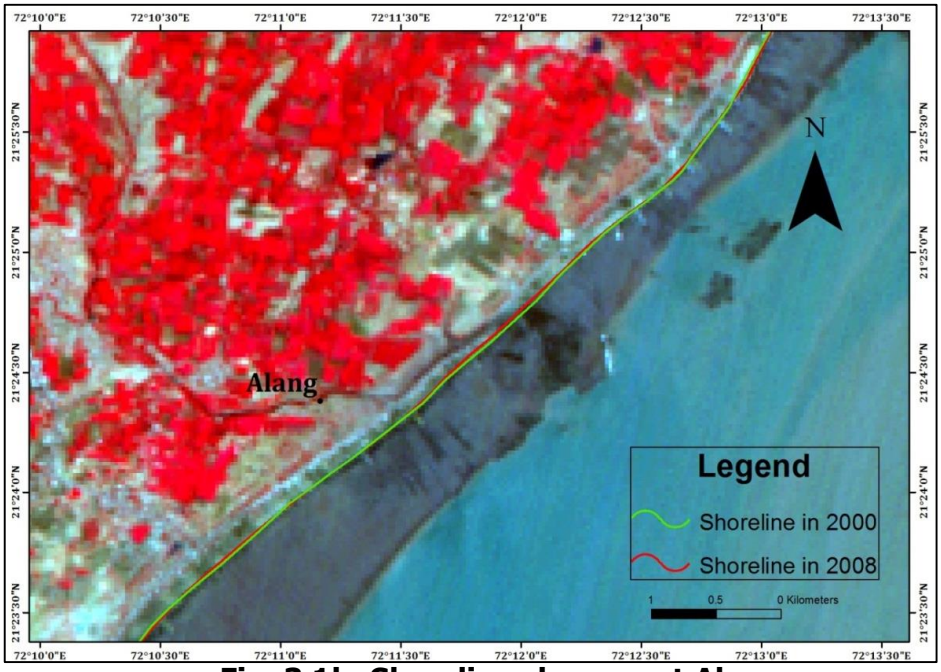


Fig. 3.1b: Shoreline changes at Alang

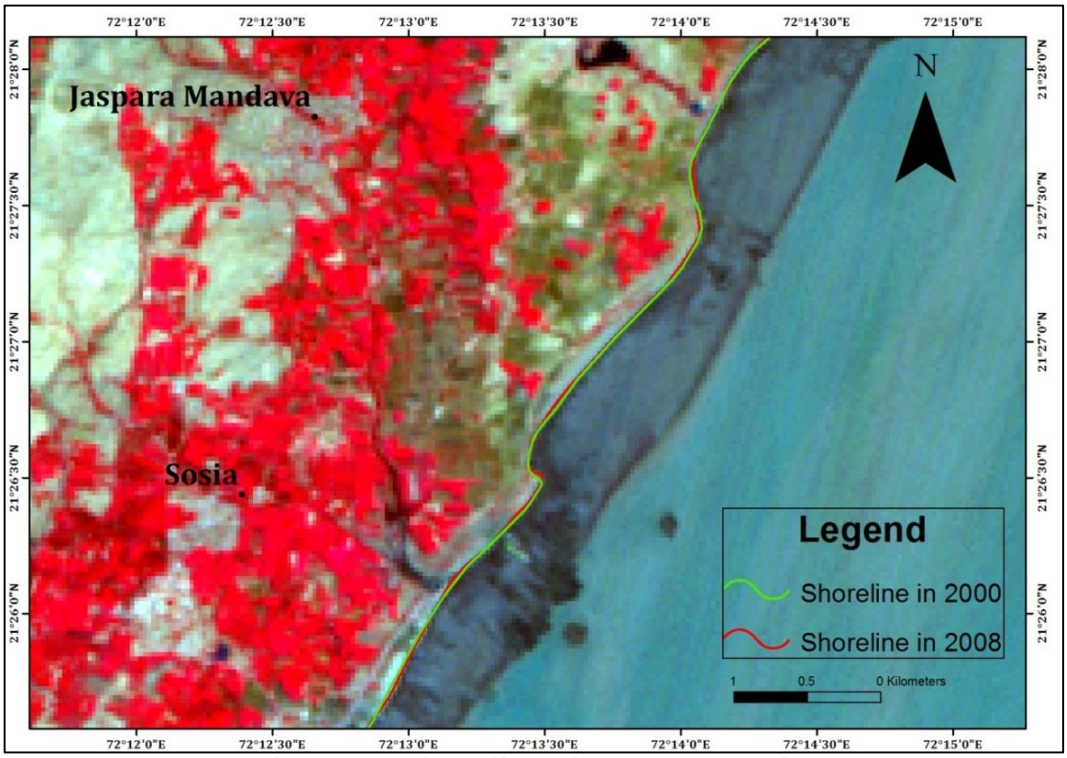


Fig. 3.1c: Shoreline changes at Sosiya

The results of the satellite analyses are in agreement of the finding of the study (National Assessment of Shoreline Change – Gujarat Coast) carried out

by Institute for Ocean Management of Anna University for Ministry of Environment and Forest. This report suggests that shoreline changes at Alang and Sosiya are smaller than 1 m and the area is classified as 'Insignificant change' (**Fig. 3.2**).

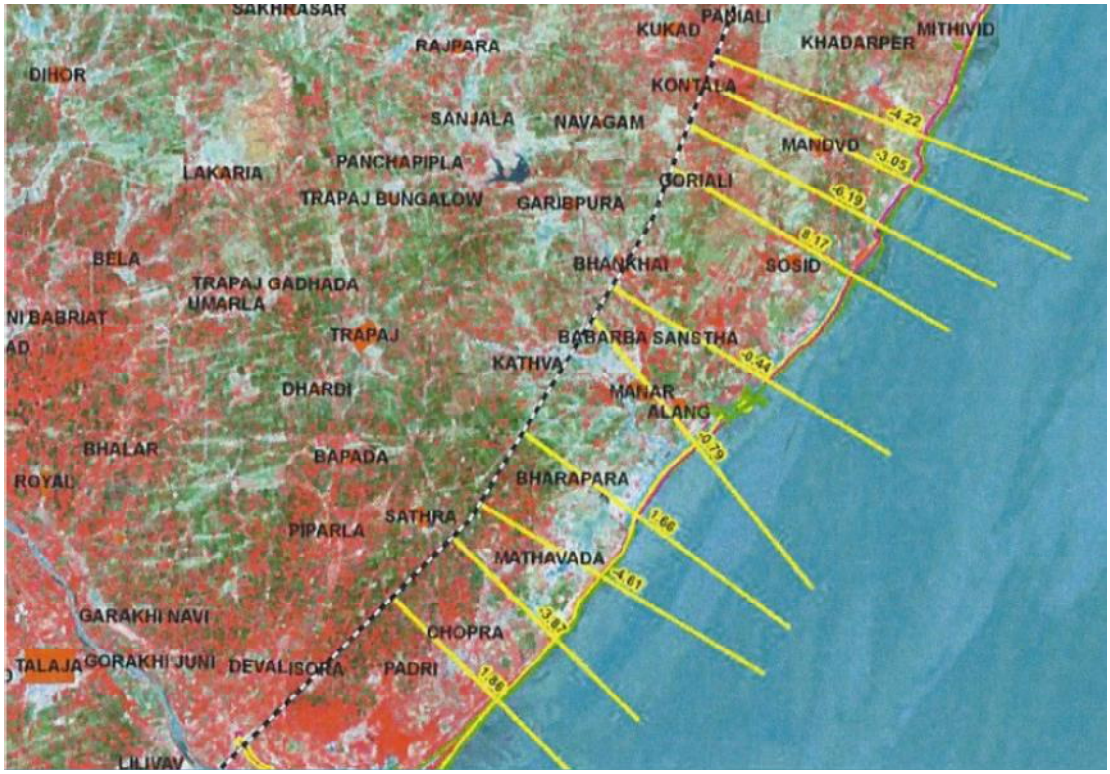


Fig. 3.2: Shoreline Changes at Alang-Sosiya

The stability of the coastline of this region is attributed to the presence of rocks and sand in the area (Photo 5). These observations provide a proof that ship breaking does not pose any impact on the coast line at Alang.

Also, the shoreline stability depends on wave attack and tides/tidal currents. In the present case, the Alang beach is very flat and is well protected from waves. No sediment movement is observed. The improvement to the existing yards as well as construction of dry dock is not going to modify tidal flow in any way as explained in the above paragraphs. Hence the proposed construction will have no effect on the shoreline. The improvement to the existing yard is not modifying wave environment as well as tidal flow in any way and hence there will be no changes in shoreline.

3.3.6 Industrial profile of the study area

The only industries within 10 km of the project area are the units which salvage, process and trade in materials recovered from ships.

3.4 BASELINE DATA GENERATION / ESTABLISHMENT OF BASELINE FOR ENVIRONMENTAL COMPONENTS

The establishment of baseline for different environmental components in the study area and at the project site has been carried out by conducting field monitoring for baseline data generation. The data generation was carried out covering Ambient Air Quality, Noise Levels, Water Quality, Soil, Ecology and Socio-economic features. Besides additional data /information regarding ecology, demographic pattern and socio-economic conditions were collected from various central and state government agencies.

3.4.1 Micro-Meteorology

Micro-meteorological conditions play a crucial role in dispersion of air pollutants. In order to determine the prevailing micro-meteorological conditions at the project site a micro-meteorological monitoring station was set up at one of the plots near the southern end of the existing SRY adjacent to the proposed expansion area (see **Photo 3.a)**.

Photo 3.a: Micro-Meteorological Station at Alang-Sosiya SRY, Summer Season, 2015

Wind speed, wind direction, air temperature and relative humidity were recorded at one hour intervals continuously throughout the three month long monitoring period.

Table 3.3 gives wind frequency pattern of day-night (24 hours), day and night as monitored during the period March, 2015 to May, 2015 at Alang-Sosiya SRY.

Table 3.2: Wind Frequency Distribution at Alang-Sosiya SRY, March - May,2015

A. 24 hours Overall

Direction	Velocity Ranges (km/hr)					Sum %
	0.1<=V<=2	2<V<=5	5<V<=10	10<V<=30	30 <V	
N	1.70	1.29	0.66	0.04	0.00	**3.68**
NNE	0.05	0.04	0.02	0.00	0.00	**0.11**
NE	0.15	0.11	0.06	0.00	0.00	**0.32**
ENE	0.39	0.30	0.15	0.01	0.00	**0.84**
E	0.68	0.52	0.26	0.02	0.00	**1.47**
ESE	0.19	0.15	0.08	0.00	0.00	**0.42**
SE	1.07	0.81	0.41	0.02	0.00	**2.32**
SSE	1.79	1.36	0.70	0.04	0.00	**3.90**
S	1.55	1.18	0.60	0.03	0.00	**3.37**
SSW	2.18	1.66	0.85	0.05	0.00	**4.74**
SW	3.93	2.99	1.53	0.09	0.00	**8.53**
WSW	4.75	3.62	1.85	0.11	0.00	**10.32**
W	6.45	4.91	2.50	0.14	0.00	**14.00**
WNW	3.63	2.77	1.41	0.08	0.00	**7.90**
NW	2.57	1.96	1.00	0.06	0.00	**5.58**
NNW	1.99	1.51	0.77	0.04	0.00	**4.32**
SUM %	**33.07**	**25.18**	**12.85**	**0.73**	**0.00**	**71.80**
CALM = 28.21						

B. Day Time (0600 – 1800 Hrs.)

Direction	Velocity Ranges (km/hr)					Sum %
	0.1<=V<=2	2<V<=5	5<V<=10	10<V<=30	30 <V	
N	1.50	0.51	0.11	0.00	0.00	**2.12**
NNE	0.00	0.00	0.00	0.00	0.00	**0.00**
NE	0.15	0.05	0.01	0.00	0.00	**0.21**
ENE	0.60	0.20	0.04	0.00	0.00	**0.85**
E	1.05	0.36	0.08	0.00	0.00	**1.48**
ESE	0.15	0.05	0.01	0.00	0.00	**0.21**
SE	1.20	0.41	0.09	0.00	0.00	**1.70**
SSE	1.64	0.56	0.12	0.00	0.00	**2.33**
S	0.45	0.15	0.03	0.00	0.00	**0.64**
SSW	2.09	0.72	0.16	0.00	0.00	**2.97**
SW	3.89	1.33	0.29	0.00	0.00	**5.51**
WSW	6.13	2.10	0.46	0.00	0.00	**8.69**
W	8.67	2.97	0.65	0.00	0.00	**12.29**
WNW	5.23	1.79	0.39	0.00	0.00	**7.42**
NW	4.93	1.69	0.37	0.00	0.00	**6.99**
NNW	1.94	0.67	0.15	0.00	0.00	**2.75**
SUM %	**39.62**	**13.56**	**2.96**	**0.00**	**0.00**	**56.15**
CALM = 43.86						

C. Night time (1800 – 0600 Hrs.)

Direction	Velocity Ranges (km/hr)					Sum %
	0.1<=V<=2	2<V<=5	5<V<=10	10<V<=30	30 <V	
N	1.59	2.19	1.35	0.09	0.00	**5.23**
NNE	0.06	0.09	0.05	0.00	0.00	**0.21**
NE	0.13	0.18	0.11	0.01	0.00	**0.42**
ENE	0.25	0.35	0.22	0.01	0.00	**0.84**
E	0.45	0.61	0.38	0.02	0.00	**1.46**
ESE	0.19	0.26	0.16	0.01	0.00	**0.63**
SE	0.89	1.23	0.76	0.05	0.00	**2.93**
SSE	1.66	2.28	1.41	0.09	0.00	**5.44**
S	1.85	2.55	1.57	0.10	0.00	**6.07**
SSW	1.98	2.72	1.68	0.11	0.00	**6.49**
SW	3.50	4.83	2.98	0.19	0.00	**11.51**
WSW	3.63	5.00	3.09	0.20	0.00	**11.93**
W	4.78	6.58	4.06	0.26	0.00	**15.69**
WNW	2.55	3.51	2.17	0.14	0.00	**8.37**
NW	1.27	1.76	1.08	0.07	0.00	**4.18**
NNW	1.78	2.46	1.52	0.10	0.00	**5.86**
SUM %	**26.56**	**36.6**	**22.59**	**1.45**	**0.00**	**77.74**
CALM = 12.76						

From the above table predominant wind direction during summer season, 2015 was found to be West (W), which prevailed for ~14% of the time, followed by west-south-west (WSW), which prevailed for ~10.3% of the time. Calm conditions prevailed for 28.21% of the time. During day time, predominant wind direction was found to be West (W), which prevailed for ~12.3% of the time, followed by west-south-west (WSW), which prevailed for ~8.7% of the time. Calm conditions prevailed for ~43.9% of the time. At night, the predominant wind direction was found to be West (W), which prevailed for ~15.7% of the time, followed by west-south-west (WSW), which prevailed for ~11.9% of the time; Calm conditions prevailed for ~12.8% of the time.

Figs. 3.3a, 3.3b and **3.3c** give the wind rose as observed at Alang Sosiya SRY during day time, night-time and overall respectively during summer season, 2015.

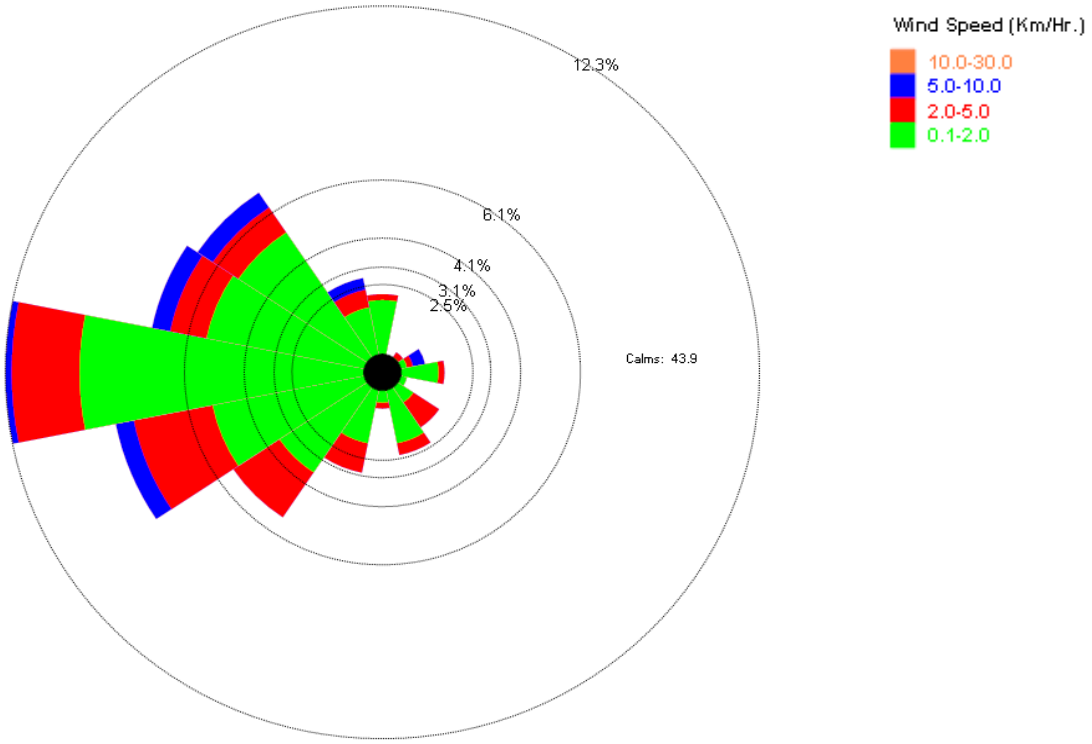


Fig. 3.3a: Day Time Wind Rose at Alang-Sosiya SRY (Summer Season, 2015)

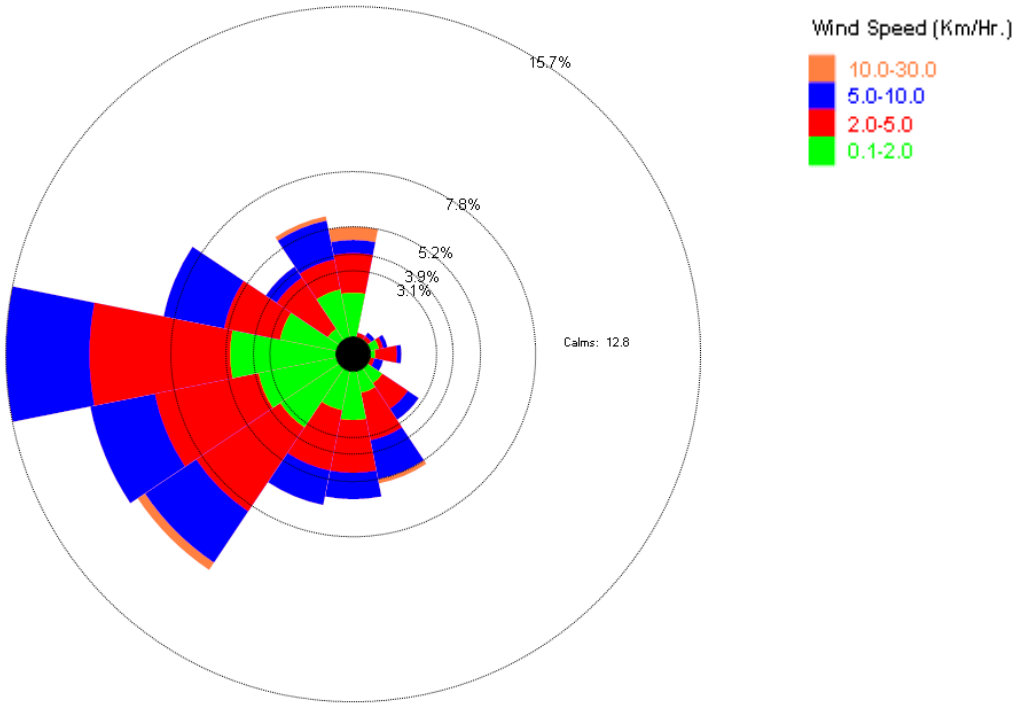


Fig. 3.3b: Night Time Wind Rose at Alang Sosiya SRY (Summer Season, 2015)

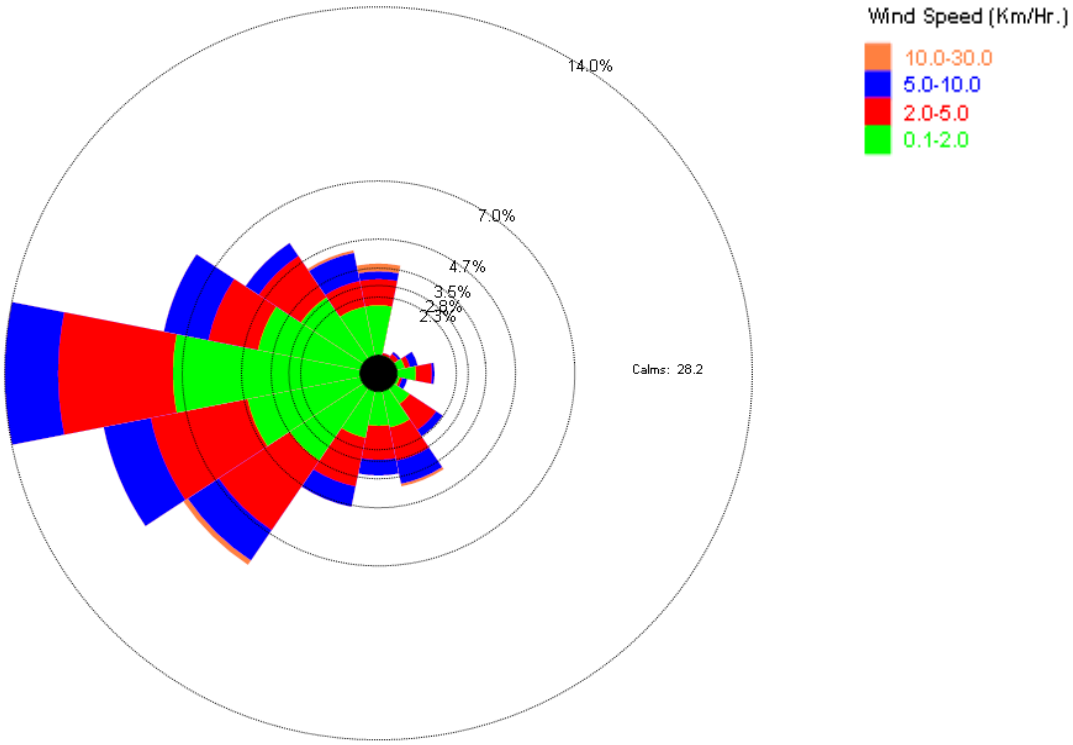


Fig. 3.3c: Overall Wind Rose at Alang-Sosiya SRY (Summer Season, 2015)

The maximum recorded wind-speed during the monitoring period was 19 km/hr. The average wind-speed for the entire monitoring period was ~4.2 km/hr. During the monitoring season, air temperatures ranged between 36.7°C and 22°C, the average being 29.7°C. **Table 3.3** gives the summary of meteorological data collected during Summer Season, 2015.

Table 3.3: Summarised Meteorological Data for Summer (2015)

Month	Wind speed km/hr			Temperature (°C)			Relative humidity (%)		Rainfall		
	Max.	Min.	Mean	Max.	Min.	Mean	Highest	Lowest	Total (mm)	24 hrs. highest (mm)	No. of rainy days
March	18	0	4.08	34.2	22.0	28.1	85.2	22.6	0	-	-
April	19	0	3.72	35.9	23.1	29.7	95.7	16.4	4.8	3.8	1
May	17	0	4.78	36.7	24.3	31.2	87	19	0	0	-

3.4.1 Air Quality

To quantify the impact of increased ship recycling activities on the ambient air quality, it is necessary at first to evaluate the existing ambient air quality of the study area. The existing ambient air quality, in terms of Respirable Particulate Matter (PM_{10} and $PM_{2.5}$), Sulphur-dioxide (SO_2), Oxides of Nitrogen

(NOx) and Carbon Monoxide (CO) has been measured through a planned field monitoring.

Ambient Air Quality Monitoring Location

In order to fix the locations of the monitoring stations, a model suggested by Houghland and Stephens (*Ref: The Design of Air Quality Monitoring Network; R.E. Munn, 1981)* has been used. This model suggests setting up of monitoring stations at those locations where ground level concentration (GLC) is high. The probability factor was found by determining the "coverage factor" for potential monitoring locations around the project, which are likely to be affected due to air pollutants from the project. The coverage factors for all potential locations were calculated by the following formula:

$$A_{jk} = \frac{\text{Freq. (k)}}{(1 + D_j)}$$

Where

A_{jk} = Coverage factor of the monitoring site in the k^{th} down wind sector
Freq. (k) = Frequency of wind direction in the k^{th} sector.
D_j = Distance (km) from the source (project) to the site.

- The wind rose data of IMD Bhavnagar observatory was used to calculate the A_{jk} values of all potential AAQ monitoring stations. Stations were set up all around the project site.
- Stations were set up on all landward sides of the project area.

Possible stations covering all possible downwind directions and in varying distances up to a limited stretch from the project site were tested with this mathematical model. The station with the lowest coverage factor has been selected to serve as the control station. **Table 3.5** gives location of the ambient air quality monitoring stations and their coverage factors.

Table 3.5: Coverage factors of Potential AAQ Monitoring Sites

Sl. No.	Location	Distance & Direction from nearest Project Boundary	Coverage Factor
1.	Alang Fire Station	Adjacent	-
2.	Village Alang	1.0 km north-west	3.5
3.	Village Chopada	2.7 km north-west	1.89
4.	Village Bharapara	1.6 km north-west	2.69
5.	Village Sosiya	1.5 km north-west	2.80
6.	Village Sathara	5 km west	1.25
7.	Village Jaspara	4.5 km north	2.54
8.	Village Mathavda	1.1 km north-west	3.18
9.	Village Kathava	4.0 km north-west	1.40
10.	Village Mandva	3.9 km north-north-west	1.43

Alang Fire Station was selected as it was located between two plots of the SRY. It was chosen as the air quality at this location represents that prevailing in the existing SRY. Alang, Mathavda and Sosiya were chosen as they had the highest coverage factor. Village Kathava was chosen as it had the least coverage factor and would be the "Control Station".

The selected stations are given in **Table 3.6**. They are also marked in **Drg. No. MEC/Q770/11/S2/05**.

Table 3.6: Ambient Air Quality (AAQ) Monitoring Stations

Sl. No.	Location	Stn. Code	Latitude & Longitude
1.	Alang Fire Station	A1	21°23'45.9" N, 72°10'41.2" E
2.	Village Alang	A2	21°24'29.2"N, 72°10'41.6" E
3.	Village Sosiya	A3	21°26'00.8"N, 72°12'04.6" E
4.	Village Mathavda	A4	21°22'24.9"N, 72°08'59.8" E
5.	Village Kathava	A5	21°25'13.6" N, 72°09'0.0" E

Monitoring schedule

As mentioned earlier, the EIA report has been prepared on the basis of Ambient Air Quality data generated in the study area for one full season covering twelve weeks of summer season, 2015. Samples of 24 hourly duration were taken on each monitoring day on two days a week for twelve weeks (i.e. 24 samples were collected at each location). In case of CO, 1 – hourly samples were taken for 24 hours on each monitoring day.

Methods of Sampling and Analysis

The methods of sample collection, equipment used and analysis procedures as followed are given in **Table 3.7** and National Ambient Air Quality Standards are given in **Table 3.8.**

Table 3.7 : Methodology of Sampling & Analysis and Equipment used

Sl. No.	Parameters	Method followed
1.	PM_{10}	Gravimetric. IS:5182 (Part 23)
2.	$PM_{2.5}$	Gravimetry
3.	NOx	Jacobs and Hochheiser modified (Na-arsenite) Method. IS:5182 (Part VI)
4.	SO_2	Improved West & Gaecke method: IS:5182 (Part II)
5.	CO	NDIR Method

Table 3.8: National Ambient Air Quality Standards

Sl. No.	Parameter	Time Weighted Average	Concentration in Ambient Air	
			Industrial, Residential, Rural & Other Areas	Ecologically Sensitive Area (Notified by Central Government)
1	SO_2 ; ($\mu g/m^3$)	Annual*	50	20
		24 Hours**	80	80
2	NOx ; ($\mu g/m^3$)	Annual*	40	30
		24 Hours**	80	80
3	PM_{10}; ($\mu g/m^3$)	Annual*	60	60
		24 Hours**	100	100
4	$PM_{2.5}$; ($\mu g/m^3$)	Annual*	40	40
		24 Hours**	60	60
5	CO; (mg/m^3)	24 Hours**	1.0	1.0
		8 Hours **	02	02
		1 Hour **	04	04

**Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals*

***24 hourly or 08 hourly or 01 hourly monitored values, as applicable, shall be compiled with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days.*

Results and Discussions

Station wise detailed monitoring data are furnished in **Tables 3.9.1** to **3.9.5**. The summarized results of ambient air quality monitoring (covering PM_{10}, $PM_{2.5}$, SO_2 and NOx) are given in **Table 3.10.**

The results when compared with National Ambient Air Quality Standards (NAAQS), 2009 of Central Pollution Control Board (CPCB) indicate that air quality is within norms at all the monitoring locations. At Alang Fire station, particulate matter levels were on the higher side due to salt spray from the sea which is at times hardly 125 m away. Carbon-monoxide content was also measured and found to be within norms in all the samples

Table 3.9.1 : Detailed Ambient Air Quality results for Opp. Alang Fire Station, Summer 2015

Sample No.	Date	Results in µg/m³				CO Results in mg/m³		
		PM_{10}	$PM_{2.5}$	SO_2	NOx	Max.	Min.	Avg.
1	03-03-15	77	50	9.5	45.5	0.98	0.15	0.44
2	08-03-15	71	48	9.6	34.5	0.99	0.13	0.41
3	12-03-15	84	58	8.5	30.2	0.88	0.16	0.38
4	15-03-15	114	63	11.2	36.6	1.022	0.15	0.53
5	19-03-15	66	41	6.2	44.0	1.02	0.15	0.46
6	22-03-15	66	46	7.8	35.6	1.06	0.15	0.47
7	25-03-15	65	37	8.5	32.2	1.11	0.15	0.52
8	28-03-15	88	54	8.2	20.2	1.22	0.15	0.55
9	01-04-15	98	56	4.5	36.6	1.05	0.12	0.39
10	05-04-15	63	27	6.2	24.2	1.22	0.12	0.40
11	08-04-15	73	47	8.5	30.2	1.20	0.18	0.53
12	11-04-15	95	46	7.2	29.6	0.88	0.11	0.40
13	15-04-15	87	55	5.3	30.2	1.32	0.11	0.51
14	20-04-15	84	51	4.5	42.2	0.99	0.19	0.54
15	23-04-15	80	45	7.2	36.6	1.05	0.11	0.48
16	27-04-15	86	37	6.6	30.2	1.22	0.15	0.42
17	02-05-15	98	56	8.5	21.2	1.20	0.08	0.48
18	06-05-15	75	35	9.5	32.2	1.11	0.13	0.53
19	09-05-15	84	41	6.3	29.6	1.30	0.12	0.46
20	13-05-15	87	36	5.5	26.6	0.99	0.12	0.46
21	18-05-15	75	35	7.5	32.2	1.05	0.10	0.48
22	22-05-15	56	26	6.2	30.2	0.99	0.09	0.48
23	26-05-15	61	32	5.2	22.2	0.95	0.15	0.43
24	30-05-15	83	42	7.5	28.3	1.08	0.14	0.45

Table 3.9.2 : Detailed Ambient Air Quality results for Alang Village, Summer 2015

Sample No.	Date	Results in µg/m³				CO Results in mg/m³		
		PM_{10}	$PM_{2.5}$	SO_2	NOx	Max.	Min.	Avg.
1	03-03-15	82	56	7.5	20.2	0.77	0.08	0.33
2	08-03-15	59	30	8.5	16.6	0.99	0.08	0.34
3	12-03-15	66	40	5.5	32.2	0.85	0.11	0.37
4	15-03-15	98	58	10.5	30.2	0.68	0.15	0.32
5	19-03-15	81	52	10.2	20.2	0.85	0.08	0.31
6	22-03-15	69	40	6.3	25.2	0.88	0.11	0.30
7	25-03-15	97	51	4.5	18.5	0.65	0.08	0.29
8	28-03-15	98	54	8.6	25.2	0.85	0.15	0.33
9	01-04-15	88	32	5.8	20.2	0.88	0.19	0.37
10	05-04-15	81	35	6.4	30.2	0.77	0.22	0.38
11	08-04-15	80	34	6.8	21.2	0.78	0.11	0.38
12	11-04-15	111	66	9.2	32.2	0.78	0.14	0.34
13	15-04-15	48	22	4.5	28.5	0.82	0.15	0.36
14	20-04-15	65	26	6.6	30.2	0.78	0.15	0.33
15	23-04-15	76	29	7.2	18.5	0.82	0.14	0.38
16	27-04-15	75	26	5.6	13.2	0.88	0.11	0.39
17	02-05-15	68	38	8.4	19.6	0.61	0.13	0.36
18	06-05-15	71	38	9.5	15.5	0.74	0.17	0.36
19	09-05-15	80	42	7.2	16.6	0.70	0.10	0.21
20	13-05-15	65	34	5.5	18.5	0.61	0.13	0.34
21	18-05-15	75	38	6.5	12.2	0.80	0.11	0.36
22	22-05-15	55	26	5.4	28.5	0.74	0.11	0.36
23	26-05-15	70	33	6.2	27.5	0.87	0.08	0.35
24	30-05-15	95	58	5.2	26.6	0.88	0.10	0.33

Table 3.9.3 : Detailed Ambient Air Quality results for Sosiya Village, Summer 2015

Sample No.	Date	Results in µg/m³				CO Results in mg/m³		
		PM_{10}	$PM_{2.5}$	SO_2	NOx	Max.	Min.	Avg.
1	03-03-15	83	45	5.6	20.2	0.84	0.08	0.30
2	08-03-15	77	45	9.6	16.6	0.75	0.08	0.28
3	12-03-15	98	55	4.8	19.5	0.75	0.08	0.30
4	15-03-15	66	37	7.6	30.2	0.88	0.08	0.33
5	19-03-15	92	56	5.2	21.2	0.78	0.08	0.29
6	22-03-15	68	39	4.8	15.5	0.74	0.09	0.33
7	25-03-15	81	40	5.1	17.3	0.84	0.09	0.33
8	28-03-15	75	44	9.5	31.2	0.78	0.13	0.33
9	01-04-15	66	34	5.5	26.6	0.82	0.10	0.34
10	05-04-15	97	52	6.2	15.5	0.65	0.11	0.30
11	08-04-15	85	44	4.2	16.6	0.62	0.08	0.24
12	11-04-15	97	42	5.5	20.2	0.80	0.08	0.27
13	15-04-15	66	31	6.2	18.5	0.82	0.09	0.35
14	20-04-15	58	28	6.3	16.6	0.88	0.09	0.33
15	23-04-15	87	41	4.5	26.2	0.85	0.08	0.33
16	27-04-15	56	29	5.5	16.5	0.85	0.07	0.26
17	02-05-15	48	23	8.5	34.5	0.75	0.08	0.26
18	06-05-15	58	27	9.6	30.2	0.82	0.08	0.24
19	09-05-15	75	30	6.5	16.2	0.56	0.08	0.21
20	13-05-15	45	26	5.2	12.2	0.84	0.11	0.35
21	18-05-15	68	31	4.5	16.6	0.88	0.11	0.31
22	22-05-15	70	37	5.2	15.2	0.78	0.09	0.31
23	26-05-15	87	44	6.2	21.2	0.85	0.12	0.35
24	30-05-15	66	32	4.5	16.2	0.62	0.08	0.29

Table 3.9.4 : Detailed Ambient Air Quality results for Mathavda Village, Summer 2015

Sample No.	Date	Results in µg/m³				CO Results in mg/m³		
		PM_{10}	$PM_{2.5}$	SO_2	NOx	Max.	Min.	Avg.
1	03-03-15	80	41	5.2	20.2	0.75	0.09	0.31
2	08-03-15	70	33	4.8	16.2	0.85	0.09	0.30
3	12-03-15	52	27	6.2	31.2	0.75	0.09	0.26
4	15-03-15	31	14	4.6	15.5	0.75	0.09	0.28
5	19-03-15	94	41	8.5	34.2	0.66	0.12	0.31
6	22-03-15	87	44	7.2	20.2	0.71	0.09	0.30
7	25-03-15	66	31	6.2	18.5	0.66	0.09	0.31
8	28-03-15	74	38	8.3	17.0	0.75	0.09	0.29
9	01-04-15	70	40	4.2	21.2	0.66	0.09	0.30
10	05-04-15	65	32	6.6	28.5	0.88	0.09	0.29
11	08-04-15	84	41	5.2	30.2	0.66	0.07	0.30
12	11-04-15	74	36	4.5	15.5	0.88	0.09	0.32
13	15-04-15	56	27	6.2	13.1	0.68	0.09	0.23
14	20-04-15	48	22	7.5	20.2	0.75	0.09	0.30
15	23-04-15	77	38	6.2	26.6	0.99	0.09	0.29
16	27-04-15	58	29	5.5	25.5	0.88	0.08	0.39
17	02-05-15	78	38	5.5	20.2	0.62	0.09	0.29
18	06-05-15	56	27	4.5	16.6	0.85	0.09	0.31
19	09-05-15	57	27	7.2	18.5	0.90	0.09	0.29
20	13-05-15	64	34	8.5	16.2	0.66	0.09	0.25
21	18-05-15	74	36	9.2	18.5	0.77	0.09	0.26
22	22-05-15	54	28	7.5	20.2	0.75	0.06	0.23
23	26-05-15	58	27	6.2	30.2	0.55	0.08	0.22
24	30-05-15	81	45	5.5	19.5	0.64	0.11	0.24

Table 3.9.5 : Detailed Ambient Air Quality results for Kathava Village, Summer 2015

Sample No.	Date	Results in µg/m^3				CO Results in mg/m^3		
		PM_{10}	$PM_{2.5}$	SO_2	NOx	Max.	Min.	Avg.
1	03-03-15	97	52	5.2	21.6	0.72	0.11	0.33
2	08-03-15	68	35	6.2	16.5	0.78	0.12	0.36
3	12-03-15	94	50	7.8	14.2	0.88	0.19	0.29
4	15-03-15	78	42	5.2	23.2	0.92	0.08	0.30
5	19-03-15	88	50	4.6	25.5	0.54	0.09	0.20
6	22-03-15	63	30	6.8	26.2	0.61	0.09	0.30
7	25-03-15	73	46	7.9	18.5	0.77	0.09	0.33
8	28-03-15	60	32	4.5	24.5	0.55	0.09	0.28
9	01-04-15	56	26	6.2	21.2	0.74	0.15	0.35
10	05-04-15	72	38	5.5	16.2	0.66	0.11	0.30
11	08-04-15	68	35	4.5	15.5	0.56	0.09	0.28
12	11-04-15	85	45	5.6	26.2	0.66	0.09	0.27
13	15-04-15	48	41	<4.0	20.2	0.66	0.09	0.23
14	20-04-15	54	45	6.2	18.5	0.63	0.06	0.29
15	23-04-15	62	36	5.5	21.2	0.65	0.07	0.22
16	27-04-15	67	28	4.5	30.2	0.88	0.08	0.26
17	02-05-15	81	31	5.2	16.6	0.75	0.09	0.29
18	06-05-15	87	22	<4.0	27.5	0.62	0.08	0.27
19	09-05-15	86	41	<4.0	15.5	0.75	0.08	0.29
20	13-05-15	96	48	<4.0	18.5	0.75	0.08	0.32
21	18-05-15	55	29	<4.0	23.2	0.74	0.09	0.30
22	22-05-15	48	26	6.3	24.2	0.85	0.08	0.30
23	26-05-15	73	34	6.2	15.5	0.90	0.09	0.29
24	30-05-15	88	48	8.5	26.6	0.68	0.09	0.33

Table 3.10: Summarised Ambient Air Quality Monitoring Results

Name of monitoring equipment used	PM_{10} ($\mu g/m^3$)			$PM_{2.5}$ ($\mu g/m^3$)			SO_2 ($\mu g/m^3$)			NOx ($\mu g/m^3$)			CO (mg/m^3)		
	Respirable Dust Sampler (RDS)			$PM_{2.5}$ Dust Sampler			RDS & Spectro-photometer			RDS & Spectro-photometer			NDIR Method		
Equipment sensitivity	Detection Limit: 1 $\mu g/m^3$			Detection Limit: 1 $\mu g/m^3$			Detection Limit: 4 $\mu g/m^3$			Detection Limit: 10 $\mu g/m^3$			Detection Limit: 0.057 mg/m^3		
AAQ monitoring stations	Max.	Min.	C_{98}	Max.	Min.	C_{98}	Max.	Min.	C_{98}	Max.	Min.	C_{98}	Max.	Min.	C_{98}
Alang Fire Station	114	56	98	63	26	58	11.2	4.5	9.6	45.5	20.2	44.0	1.32	0.08	1.06
Alang Village	111	48	98	66	22	58	10.5	4.5	10.2	32.2	12.2	32.2	0.99	0.08	0.80
Sosiya Village	98	45	97	56	23	55	9.6	4.2	9.6	34.5	12.2	31.2	0.88	0.07	0.82
Mathavda	94	31	87	45	14	44	9.2	4.2	8.5	34.8	13.1	31.2	0.99	0.06	0.75
Kathava Village	97	48	96	52	22	50	8.5	4.5	7.9	30.2	14.2	27.5	0.92	0.06	0.75

Work Zone Air Quality

One 8 hourly sample was collected at three representative work zones to assess work zone air quality during Summer 2015. The summarized results are given in **Table 3.11**.

Table 3.11: Summarised Results of Work Zone Air Quality Monitoring

Location	Date	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO
Plot in southern part of SRY	12-04-2015	127	58	6.6	38.5	810
Plot in northern part of SRY	12-04-2015	195	86	9.2	41.1	1260
TSDF Area	10-04-2015	120	71	8.9	32,5	750
All values in $\mu g/m^3$						

The Work Zone Air Quality has been compared with the following norms:

SPM:10,000 $\mu g/m^3$ (after American Council of Government Industrial Hygienists)
SO_2: 5,000 $\mu g/m^3$ (after Indian Factories Act)
NO_x: 6,000 $\mu g/m^3$ (after Indian Factories Act)
CO : 40,000 $\mu g/m^3$ (after Indian Factories Act)

It can be seen that the Work Zone Air Quality is well within the norms.

3.4.2 Water Quality

Sources of water in the study area are surface water in sea / creeks and ground water.

3.4.2.1 Water Quality Monitoring stations, Frequency and Mode of Sampling

Water samples have been collected thrice during summer season, 2015 from sixteen (16) locations, which are listed in **Table 3.12**. The locations of the surface water and ground water sampling points are marked in **Drawing No. MEC/Q770/11/S2/05**.

Table 3.12: Water Sampling Locations, Summer Season, 2015

Sl. No.	Location	Stn. No.	Type	Distance from project area and Latitude & Longitude
1	Pasvivali Creek	SW1	Creek Water	0.4 km West (21°26'09.3"N, 72°13'6.3"E)
2	Sea, intertidal zone at southern end of existing yard	SW2	Sea Water	- (21°22'35.8"N, 72°10'01.1"E)
3	Sea, intertidal zone at site of Dry Dock 2	SW3	Sea Water	- (21°21'39.9"N, 72°09'32.2"E)
4	Sea, intertidal zone near Alang Fire Station	SW4	Sea Water	- (21°23'46.8"N, 72°11'06.9"E)
5	Sea, intertidal zone near Jaspara Village	SW5	Sea Water	~4 km North-east (21°28'18.5"N, 72°14'45.4"E)
6	Sea, off southern end of existing yard	SW6	Sea Water	~1.7 km offshore (21°22'22.3"N, 72°10'54.8"E)

Sl. No.	Location	Stn. No.	Type	Distance from project area and Latitude & Longitude
7	Sea off Dry-dock 2 Site	SW7	Sea Water	~2 km offshore (21°21'19.3"N, 72°10'34.9"E)
8	Sea, off Alang Fire Station	SW8	Sea Water	~2 km offshore (21°23'06.1"N, 72°11'51.8"E)
9	Sea, off Jaspara Village	SW9	Sea Water	~2.5 km offshore (21°27'47.2"N, 72°15'53.3"E)
10	Tube-well at vill. Kathava	GW1	Ground Water	4 km north-west (22°25'14.8"N, 72°09'01.6"E)
11	Tubewell at vill. Sosiya	GW2	Ground Water	1.5 km north-west (21°25'51.2"N, 72°09'16.5"E)
12	Tubewell at vill. Alang	GW3	Ground Water	1 km north-west (21°24'32.3"N, 72°10'45.6"E)
13	Tubewell at vill. Mathavda	GW4	Ground Water	1.2 km north-west (21°22'28.0"N, 72°09'01.1"E)
14	Ship's Ballast Water	E1	Effluent	Ship beached in Plot 29
15	Ship's Bilge water	E2	Effluent	Ship beached in Plot 28
16	Treated Effluent from TSDF ETP	E3	Effluent	At Alang TSDF

Sea and Creek water samples were collected on 31-05-15. Ground water and effluent samples were collected on 30-05-15.

3.4.2.2 Water Quality

The results of analysis of surface water are given in **Tables 3.13.1, 3.13.2** and **3.13.3**. The results have been compared with the standards specified in Primary Water Quality Criteria for Designated Best Uses for Coastal Waters [As per "The Environment (Protection) Rules, 1986 (as given in **Table 3.14**).

Table 3.13.1: Results of Analysis of Water of Pasvivali Creek (SW1)
(Date of Sampling: 31-05-2015)

Sl. No.	Parameter	Results
1	pH Value	7.41
2	Colour & Odour	32 & Slight fishy smell
3	Dissolved Oxygen (as O_2), mg/l	6
4	Suspended Solids, mg/l	1758
5	Turbidity, NTU	225
6	BOD (3 days at 27 °C), mg/l.	4
7	Total Dissolved Solids, mg/l	43900
8	Free Ammonia (as NH_3), mg/l	0.36
9	Oil & Grease, mg/l	<0.1
10	Lead (as Pb), mg/l	<0.005
11	Mercury (as Hg) mg/l	<0.0005
12	Cadmium (as Cd), mg/l	<0.002
13	Electrical Conductivity, s/cm at 25°C	65600
14	Dissolved Iron (as Fe) mg/l	0.55
15	Dissolved Manganese (as Mn) mg/l	0.081
16	Sodium Absorption Ratio	68.16
17	Boron (as B), mg/l	7.7
18	Coliforms, MPN/100 ml	<1.8

Table 3.13.2: Results of Analysis of Sea Water in Inter-Tidal Zone
(Date of Sampling: 31-05-2015)

Sl. No.	Parameter	Results			
		SW2	SW3	SW4	SW5
1	pH Value	7.29	7.18	7.25	7.35
2	Colour & Odour	18 & Slight fishy smell	20 & Slight fishy smell	19 & Slight fishy smell	21 & Slight fishy smell
3	Dissolved Oxygen (as O_2), mg/l	6.8	6.5	6.4	6.9
4	Suspended Solids, mg/l	1572	1663	1728	1705
5	Turbidity, NTU	190	185	198	205
6	BOD (3 days at 27 °C), mg/l.	2.9	5.6	3.6	2.3
7	Total Dissolved Solids, mg/l	39920	40550	41490	39420
8	Free Ammonia (as NH_3), mg/l	<0.1	<0.1	<0.1	<0.1
9	Oil & Grease, mg/l	<0.1	<0.1	0.2	<0.1
10	Lead (as Pb), mg/l	<0.005	<0.005	<0.005	<0.005
11	Mercury (as Hg) mg/l	<0.0005	<0.0005	<0.0005	<0.0005
12	Cadmium (as Cd), mg/l	<0.002	<0.002	<0.002	<0.002
13	Electrical Conductivity, µs/cm at 25°C	50900	53156	59588	51976
14	Dissolved Iron (as Fe) mg/l	0.51	0.71	0.63	0.69
15	Dissolved Manganese (as Mn) mg/l	0.089	0.079	0.083	0.092
16	Sodium Absorption Ratio	61.6	60. 7	69.6	64.2
17	Boron (as B), mg/l	3.5	3.3	3.2	3.4
18	Coliforms, MPN/100 ml	<1.8	<1.8	<1.8	<1.8
19	Poly Chlorinated Bi Phenyls, mg/l	-	-	<0.0005	<0.0005

Table 3.13.3: Results of Analysis of Sea Water Offshore
(Date of Sampling: 31-05-2015)

Sl. No.	Parameter	Results			
		SW6	SW7	SW8	SW9
1	pH Value	7.45	7.43	7.48	7.20
2	Colour & Odour	4 & Odourless	4 & Odourless	5 & Odourless	6 & Odourless
3	Dissolved Oxygen (as O_2), mg/l	6.5	6.8	6.4	6.6
4	Suspended Solids, mg/l	823	658	708	661
5	Turbidity, NTU	60	80	84	56
6	BOD (3 days at 27 °C), mg/l.	2.7	2.9	2	3.4
7	Total Dissolved Solids, mg/l	40140	42500	39960	38200
8	Free Ammonia (as NH_3), mg/l	<0.1	<0.1	<0.1	<0.1
9	Oil & Grease, mg/l	<0.1	<0.1	<0.1	<0.1
10	Lead (as Pb), mg/l	<0.005	<0.005	<0.005	<0.005
11	Mercury (as Hg) mg/l	<0.0005	<0.0005	<0.0005	<0.0005
12	Cadmium (as Cd), mg/l	<0.002	<0.002	<0.002	<0.002
13	Electrical Conductivity, s/cm at 25°C	50700	53820	49902	51872
14	Dissolved Iron (as Fe) mg/l	0.57	0.67	0.43	0.59
15	Dissolved Manganese (as Mn) mg/l	0.087	0.092	0.078	0.083
16	Sodium Absorption Ratio	65.9	68.7	63.7	64.2
17	Boron (as B), mg/l	3.4	3.1	3.8	5.7
18	Coliforms, MPN/100 ml	<1.8	<1.8	<1.8	<1.8
19	Poly Chlorinated Bi Phenyls, mg/l	-	-	<0.0005	<0.0005

Table 3.14: Water Quality Criteria

A. Primary Water Quality Criteria for Designated Best Uses for Coastal Waters [As per "The Environment (Protection) Rules, 1986

Parameters	SW-1	SW-II	SW-III	SW-IV	SW-V
1. pH	6.5 – 8.5	6.5 – 8.5	6.5 – 8.5	6.0 – 9.0	6.0 – 9.0
2. Dissolved oxygen (as O_2), mg/l, min	5 or 60% of saturation value, whichever is higher	4 or 50% of saturation value, whichever is higher	3 or 40% of saturation value, whichever is higher	3 or 40% of saturation value, whichever is higher	3 or 40% of saturation value, whichever is higher
3. Colour & odour	No noticeable colour or offensive odour	No noticeable colour or offensive odour	No noticeable colour or offensive odour	No noticeable colour or offensive odour	None in such concentrations that would impair any usages specifically assigned to this class
4. Floating Matters	No visible, obnoxious floating debris, oil slick, scum	Nothing obnoxious or detrimental for use purpose	No visible, obnoxious floating debris, oil slick, scum	10 mg/l max. (including Oil & grease & scum / petroleum products)	-
5. Oil & grease (including petroleum products)	0.1 mg/l max.	-			
6. Suspended solids	None from sewage & industrial origin	-	-	-	
7. Heavy metals a) Mercury (as Hg) b) Lead (as Pb) c) Cadmium (as Cd)	0.001 mg/l 0.001 mg/l 0.01 mg/l	-	-	-	
8. Turbidity, NTU max.	-	30	30		
9.Faecal coliforms, MPN/100 ml, max	-	100	500	500	500
10. BOD, 3 days at 27° C, max	-	3 mg/l	-	5 mg/l	
11. Dissolved Iron (as Fe)	-	-	0.5 mg/l max.	-	-
12. Dissolved Manganese (as Mn)	-	-	0.5 mg/l max.	-	-

Parameters	SW-1	SW-II	SW-III	SW-IV	SW-V
13. Sludge deposits, solid refuse, floating solids, oil & grease, scum	-	-	-	-	None except for such small amount that may result from discharge of appropriately treated sewage & or industrial waste

SW-1 : Salt Pans, Shell fishing, mariculture and ecologically sensitive zone.
SW-II : Bathing, Contact Water Sports and Commercial Fishing
SW-III : Industrial Cooling, Recreation (non-contact) and aesthetics
SW-IV : Harbour Waters
SW-V : Navigation and Controlled Waste Disposal

The sea water quality when compared with Coastal Water Quality Criteria specified designated best uses, the water quality meets criteria specified for SW-IV. The water was too muddy because of very rough sea conditions. PCBs were less than 0.5 mg/m^3.

The result of analysis of ground water is given in **Table 3.15**. The results have been compared with the drinking water quality standards specified in IS:10500 (2012).

Table 3.15: Results of Ground Water Analysis during Summer, 2015
(Date of Sampling: 30-05-2015)

Sl. No.	Parameters	Acceptable Limit *	Permissible Limits in absence of Alternate Source *	GW1	GW2	GW3	GW4
1	Taste	Agreeable	-	Agreeable	Agreeable	Agreeable	Agreeable
2	Turbidity, NTU	Max. 1	Max. 5	<1.0	3.5	<1.0	<1.0
3	TDS,mg/l	500	Max. 2000	580	1300	1295	2380
4	Total Hardness (as $CaCO_3$), mg/l	Max.200	Max. 600	198	138.6	772.2	366.3
5	Calcium (as Ca),mg/l	Max. 75	Max. 200	39.6	27.72	122.76	51.48
6	Magnesium (as Mg),mg/l	Max. 30	Max. 100	23.76	16.63	111.67	57.02
7	Total alkalinity (as $CaCO_3$), mg/l	Max. 200	Max. 600	226.6	484.1	339.9	525.3
8	Fluoride (as F),mg/l	Max. 1	Max. 1.5	0.11	<0.1	0.2	0.28
9	Colour, Hazen	Max.5	Max. 25	<1	<1	<1	<1
10	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
11	pH at 25^oC	6.5-8.5	No relaxation	7.32	7.56	7.56	7.52
12	Chloride (as Cl),mg/l	Max. 250	Max. 1000	130.91	256.97	392.73	635.15
13	Sulphate (as SO_4),mg/l	Max. 200	Max. 400	68.31	230.95	140.26	535.93
14	Iron (as Fe),mg/l	Max. 0.3	No relaxation	<0.05	0.14	<0.05	0.07
15	Aluminium (as Al),mg/l	Max. 0.03	Max. 0.2	<0.01	<0.01	<0.01	<0.01
16	Residual Free Chlorine ,mg/l	Max. 0.2	_	<0.1	<0.1	<0.1	<0.1
17	Mercury (as Hg),mg/l	Max. 0.001	No relaxation	<0.0005	<0.0005	<0.0005	<0.0005
18	Cadmium (as Cd),mg/l	Max. 0.003	No relaxation	<0.002	<0.002	<0.002	<0.002
19	Total Arsenic (as As),mg/l	Max. 0.01	Max. 0.05	<0.01	<0.01	<0.01	<0.01
20	Anionic detergent (as MBAS), mg/l	Max. 0.2	Max. 1	<0.02	<0.02	<0.02	<0.02
21	Boron (as B),mg/l	Max. 0.5	Max. 1	<0.5	<0.5	<0.5	<0.5
22	Chromium (as Cr^{+6}),mg/l	Max. 0.05	No relaxation	<0.01	<0.01	<0.01	<0.01
23	Copper (as Cu),mg/l	Max. 0.05	Max. 1.5	<0.02	<0.02	<0.02	<0.02
24	Cyanide (as CN),mg/l	Max. 0.05	No relaxation	<0.01	<0.01	<0.01	<0.01
25	Lead (as Pb),mg/l	Max. 0.01	No relaxation	<0.005	<0.005	<0.005	<0.005
26	Manganese (as Mn) ,mg/l	Max. 0.1	Max. 0.3	<0.02	<0.02	<0.02	<0.02
27	Nitrate (as NO_3),mg/l	Max. 45	No relaxation	7.92	12.79	51.42	97.5
28	Selenium (as Se),mg/l	Max. 0.01	No relaxation	<0.005	<0.005	<0.005	<0.005
29	Zn (as Zn),mg/l	Max. 5	Max. 15	<0.02	<0.02	<0.02	<0.02
30	Phenolic Compounds (as C_6H_5OH), mg/l	Max. 0.001	Max.0.002	<0.001	<0.001	<0.001	<0.001
31	Total Coliform organisms, MPN/100 ml	Absent/100 ml	-	Nil	Nil	Nil	Nil
	* Drinking Water Specification, IS : 10500 (2012)						

From the results it can be seen that during summer season, 2015 tube-well water from Mathavda Village (GW4) is unsuitable for drinking because of excessive Dissolved Solids, Sulphates, Nitrates and Magnesium; tube-well water from Alang Village (GW3) is unsuitable for drinking because of excessive Hardness, Nitrates and Magnesium. In the other samples, some of the parameters are higher than the Desirable Limits, but within the Permissible Limits. There are indications that some degree of sea water intrusion may have taken place.

The results of effluent analysis are given in **Table 3.16**.

Table 3.16: Results of Effluent Analysis
(Date of Sampling: 30-05-2015)

Sl. No.	Characteristics	Norms	Results		
			E1 (Ballast Water)	E2 (Bilge Water)	E3 (Treated Effluent)
1	Colour, Hazen units	All efforts should be made to remove colour and unpleasant odour as far as practicable	<1.0	<1.0	<1.0
2	Odour		Unobjectionable	Unobjectionable	Unobjectionable
3	Suspended Solids, mg/l	100	223.9	435.8	14.2
4	Temperature, ^{O}C	Shall not exceed 5 ^{O}C above receiving water temperature	29 (+ 2)	30 (+ 3)	29
5	pH	5.5-9.0	7.34	7.27	7.03
6	Oil & Grease, mg/l	20 #	<1.4	5.6	<1.4
7	Ammoniacal nitrogen (as N), mg/l, Max	50	0.16	17.1	4.4
8	Total Kjeldahl nitrogen (as N), mg/l,	100	0.19	26.7	13.4
9	Free ammonia (as NH_3), mg/l	5	<0.1	14.2	0.58
10	Biochemical oxygen demand (3 days at 27ºC), mg/l	100	37.6	133	38.2
11	Chemical Oxygen Demand	250	129	439.5	161.3
12	Arsenic (as As), mg/l	0.2	<0.01	<0.01	<0.01
13	Mercury (as Hg), mg/l	0.01	<0.001	<0.001	<0.001
14	Lead (as Pb), mg/l	2.0	0.11	<0.005	<0.005
15	Cadmium (as Cd), mg/l	2.0	0.062	0.099	<0.001
16	Hexavalent chromium (as Cr^{+6}), mg/l, Max	1.0	<0.01	<0.01	<0.01
17	Total chromium (as Cr), mg/l	2.0	<0.01	0.017	<0.01
18	Copper (as Cu), mg/l	3.0	0.1	0.195	<0.02
19	Zinc (as Zn), mg/l	15	0.04	3.09	0.02
20	Selenium (as Se), mg/l	0.05	0.009	0.012	<0.005
21	Nickel (as Ni), mg/l	5.0	0.19	0.35	<0.02
22	Cyanide (as CN), mg/l	0.2	<0.001	<0.001	<0.001
23	Fluoride (as F), mg/l	15	1.36	1.14	1.23
24	Nitrate Nitrogen, mg/l	20	<0.1	<0.1	0.47
25	Sulphide (as S), mg/l	5.0	<0.1	<0.1	<0.1
26	Phenolic compounds (as C_6H_5OH), mg/l	5.0	<0.001	<0.001	<0.001
27	Dissolved Phosphate (as P), mg/l	-	0.17	<0.05	<0.05
28	Manganese (as Mn), mg/l	2	0.14	7.82	0.12
29	Iron (as Fe), mg/l	3	1.8	6.99	0.13
30	Vanadium (as V), mg/l	0.2	<0.2	<0.2	<0.2
31	Total resiudual chlorine, mg/l	1.0	<0.1	<0.1	<0.1
	# Regulation 9 of Annex I of MARPOL 73 / 78 stipulates maximum limit of 15 mg/l in undiluted effluent				

The results of Effluent Water Analysis have been compared with the General Standards for discharge of environmental pollutants to Marine Coastal waters as prescribed by MoEF&CC vide notification dated 19th May, 1993 and amendment in December,1993. From the above results it is can be that

suspended solids content of ship's ballast water as well as bilge water exceeds the norms. Bilge water is not discharged; it is pumped out into tankers and transported to a shore based effluent treatment plant (ETP) at Alang Waste TSDF. It may also be noted that Regulation 9 of Annex I of MARPOL 73 / 78 prohibits the discharge of oily effluent whose oil content does not exceed 15 parts per million (ppm) without dilution. The oil content of the discharge water does not exceed 15 ppm. In bilge water iron and manganese content exceeds the norms but after treatment is reduced to well within the norms as can be seen from the results of analysis of treated effluent at Alang TSDF.

3.4.3 Noise Levels

In order to have an idea about the existing ambient noise level of the study area, noise monitoring has been carried out at seven locations during summer season, 2015. All the stations are listed in **Table 3.17**. These stations are also marked in **Drg. No. MEC/Q770/11/S2/05.**

Table 3.17 : Ambient Noise Monitoring Stations

Sl. No.	Location	Stn Code	Distance & Direction from nearest Project Boundary	Monitoring Date
1.	In front of Alang Fire Station	AN1	Adjacent	1 – 2 May, 2015
2.	Village Alang	AN2	1.0 km north-west	1 – 2 May, 2015
3.	Village Sosiya	AN3	1.5 km north-west	28 – 29 April, 2015
4.	Village Mathavda	AN4	• 1.9 km west-south-west from existing yard. • 1.1 km north-west from expansion area	3 – 4 May, 2015
5.	Village Kathava	AN5	4.0 km north-west	2 – 3 May, 2015
6.	Village Chopada	N6	• 4.3 km south-west from existing yard. • 2.7 km west from expansion area	13 – 14 April, 2015
7.	Village Bharpara	N7	1.6 km north-west	15 – 16 April, 2015

Noise Monitoring Frequency

Monitoring was carried out once during Summer Season, 2015. At each ambient noise monitoring station, Leq. Noise level has been recorded at hourly intervals for 24 hours continuously by operating the noise-recording instrument for fifteen (15) minutes during each hour.

Results and Discussions

The summarized results of ambient noise monitoring are given in **Table 3.18**. The results have been compared with the standard specified in Schedule III, Rule 3 of Environmental Protection Rules given in **Table 3.19.**

Table 3.18: Summarised Results of Noise Monitoring

Stn. No.	Location	Results					
		Day (0600-2200 hr.)			Night (2200-0600 hr.)		
		Max.	Min.	Avg.*	Max.	Min.	Avg.*
ANI	In front of Alang Fire Station	78.0	44.0	72.2	50.4	41.5	45.5
AN2	Alang Village	56.6	45.9	53.0	47.5	40.5	43.7
AN3	Sosiya Village	61.3	42.9	54.9	43.0	40.6	42.0
AN4	Mathavda Village	52.7	41.4	49.6	46.4	40.5	42.4
AN5	Kathava Village	60.4	47.0	55.0	49.5	41.1	44.7
N6	Chopada Village	56.2	43.5	52.1	44.6	40.3	42.2
N7	Bharpara Village	57.1	45.3	52.2	44.6	40.4	42.8
** Logarithmic Averages.*					*All Values in dB (A).*		

Table 3.19: Ambient Air Quality norms in respect of Noise (As Per Schedule III, Rule 3 of Environment Protection Rules)

Type of Area	Day (0600 – 2200 hrs).	Night (2200 – 0600 hrs.)
Industrial Area	75	70
Commercial Area	65	55
Residential Area	55	45
Silence Zone	50	40

All Values in dB (A)

The results indicate that noise levels at all the villages were within the norms for Residential Areas; some readings exceeded the norms but the average noise levels did not. Noise levels at Alang Fire Station have been compared with the norms for Industrial Areas. A few readings exceeded the norms but the average noise levels did not.

3.4.4 Soil Characteristics

To assess the quality of soil in and around the project area, soil samples were collected from five locations on 30th May, 2015. **Table 3.20** lists the soil sampling locations. These locations are also marked in **Drg. No. MEC /Q770/11/S2/05.**

Table 3.20: List of Soil Sampling Locations

Sample No.	Location	Type of Land
S1	Manar Village (*21°24' 46.1" N, 72°10'22.1" E*)	Agricultural Land
S2	Manar Village (*21°24' 50.5" N, 72°09'57.3" E*)	Barren Land
S3	Alang Village (*21°24' 45.3" N, 72°10'49.0" E*)	Agricultural Land
S4	Alang Village (*21°24' 48.5" N, 72°11'5.0" E*)	Fallow land
S5	Landfill Site in Alang TSDF (*21°24' 48.42" N, 72°9'42.68" E*)	Barren Land

The results of analysis are given in **Tables 3.21, 3.22, 3.23,** and **3.24**

Table 3.21: Physical Properties of Soil

Parameters	S1	S2	S3	S4	S5
Texture	Sandy-clay	Sand	Clay	Sandy Clay loam	Sand
Water Holding Capacity %	45.7	23.4	41.8	35.3	33.7

Table 3.22: Chemical Properties of Soil

Parameters	S1	S2	S3	S4	S5
pH	7.85	8.28	8.09	7.81	8.95
Electrical Conductivity (μs/cm)	691	125	560	368	186

Soil pH plays an important role in the availability of nutrients. Soil microbial activity is also dependent on pH. In the study area the soil pH is slightly alkaline (7.85 < pH <8.95).

Electrical conductivity (EC) is a measure of the soluble salts and ionic activity in the soil. In the collected soil samples the conductivity ranged from 125 to 691 μs/cm.

Table 3.23: Available Major Nutrients in Soil

Parameters	S1	S2	S3	S4	S5
Available Nitrogen (kg/ha) & Rating	434.6 Medium	131.7 Low	513.6 Medium	395.1 Medium	184.4 Low
Available Phosphorus (Kg/ha) and Rating	123.2 High	306.5 High	55.4 High	14 Medium	<6.72 Low
Available Potassium (Kg/ha) and Rating	896 High	134.4 Medium	784 High	537.6 High	134.4 Medium
Organic carbon (%) and Ratings	0.84 High	0.06 Low	1.28 High	0.17 Low	0.06 Low
Rating based on: Available Nitrogen <280 - Low; 280- 560 Medium; >560 - High Available Phosphorus <10 - Low; 10 - 25 Medium; >25 - High Available Potassium <120 - Low; 120 - 280 Medium; >280 - High. Organic carbon <0.50- Low; 0.5-0.75 Medium; > 0.75 - High					

Phosphorus and Nitrogen are limiting nutrients. In the tested soil samples, availability of phosphorus is high in all samples. Available Nitrogen is high to medium. Organic carbon matter is low to high.

Table 3.24: Soil Chemical constituents

(i) Exchangeable Cations

Parameters	S1	S2	S3	S4	S5
Calcium (meq/100gm)	34 (68.82)	41.5 (92.80)	48 (77.05)	29 (74.74)	48.5 (78.69)
Magnesium (meq/100gm)	14 (28.34)	2.5 (5.59)	20 (32.10)	9 (23.20)	10.5 (17.04)
Sodium (meq/100gm)	0.478 (0.97)	0.565 (1.26)	1.478 (2.37)	0.261 (0.67)	2.478 (4.02)
Potassium (meq/100gm)	0.923 (1.87)	0.154 (0.34)	0.821 (1.32)	0.538 (1.39)	0.154 (0.25)

Figures in ( ) gives the % contribution of the respective ions to Base Saturation.

(ii) Soil micronutrients

Parameters	S1	S2	S3	S4	S5
Copper	<0.2	<0.2	0.25	<0.2	<0.2
Zinc	<0.2	<0.2	0.23	<0.2	<0.2
Iron	<4	<4	<4	5.48	<4
Manganese	15.2	<2.0	6.6	<2.0	10.7
	Values in mg/ kg				

The above results show that in four of the five tested soil samples calcium and magnesium constitute bulk of the exchangeable cations whereas proportion of exchangeable sodium and potassium were low.

Soil micro-nutrients also play an important role in plant growth and can act as limiting nutrients. Soil micro-nutrient analysis can be employed as a diagnostic tool for predicting the possibility of deficiency of a nutrient and the profitability of its application. For this, it is essential to fix the critical limits. The critical limit of micro-nutrient in a soil is that content of extractable nutrient at or below which plantation practised on it will produce a positive response to its application. The critical limits of copper, zinc and iron are 0.20-0.66 mg/kg, 0.50-0.65 mg/kg and 4.5-6.0 mg/kg respectively. Excess of one more micro-nutrients can slow down the uptake of other micro-nutrients due to the antagonistic effect. Excess of copper affects uptake of Molybdenum, another micro-nutrient. Excess of Zinc, Manganese and Copper affect Iron uptake. Excess Iron, Copper and Zinc affect Manganese uptake. This can improve soil fertility by neutralizing the effect of some excess micro-nutrients or can reduce soil fertility by blocking uptake of critically needed micro-nutrients. From the above Table it can be seen that in all of the five samples micronutrient levels are lower than the critical limits. This indicates that while the existing fertility levels are low, it is possible to improve the fertility by adding micro-nutrients.

Poly Chlorinated Biphenyl (PCB) content of sediment samples collected from the yard as well as from the control station (near Jaspara Village) was determined and found to be below 0.5 mg/kg in all samples.

3.4.5 Ecology

The study area is located on the western shore of the Gulf of Khambat. There are no conservation areas in the region. The nearest National Park, Blackbuck National Park Velavedar is more than 60 km away.

Ecology of the area was studied by collecting information on flora & fauna of the area from Taloja Range Office of Bhavnagar Forest Division, discussions with local Forest Department personnel & villagers. The same was backed up by actual field studies / observations.

3.4.5.1 Terrestrial Ecology

The landward part of study area is mostly rural and comprises of agricultural land, waste / barren lands, rural settlements, tidal creeks and mud flats. Due to low rainfall and poor soil cover, most of the vegetation is xerophytic.

236 (including cultivated species) species of flowering plants have been recorded from Alang-Sosiya area. This includes 199 species of dicots and 37 species of monocots. The dominant families are Papilionaceae (25 species), Poaceae (24 species), Convolvulaceae and Malvaceae (13 species each). There are no mangroves in the study area.

Project Area Flora

The project site consists of a narrow strip of beach and area just beyond. On the beach the natural vegetation is dominated by clumps of *Acacia nilotica* and *Prosopis juliflora* (see **Photos 3.b**). The natural vegetation of the site of the labour colony too is similar. However in this area there are some other species, such as *Azadirachta indica, Ailanthus excelsa,* various grasses, herbs and shrubs also.

Photo 3.b: Natural Vegetation in Proposed Expansion Area (April, 2015)

During the survey, 12 different species of plants belonging to 9 families were seen in the project area, which are listed in **Table 3.25**.

Table 3.25: Plants Found in Project Site

Sl. No.	Scientific Name	Local Name	Habit	Family
1.	*Acacia nilotica*	Bhaval	Tree	Mimosaceae
2.	*Agave americana*	Ketki	Under-shrub	Agavaceae
3.	*Calotropis procera*	Ankado	Shrub	Asclepiadaceae
4.	*Cynodon dactylon*	Dhroknad	Grass	Poaceae
5.	*Commelina benghalensis*	Shishmuliyan	Herb	Commelinaceae
6.	*Leucaena leucocephala*	Subabul	Tree	Fabaceae
7.	*Parthenium hysterophorus*	-	Herb	Asteraceae
8.	*Paspalum spp.*	-	Grass	Poaceae
9.	*Pergularia daemia*	Chamar dudheli	Climber	Asclepiadaceae
10.	*Prosopis juliflora*	Gando baval	Small tree	Mimosaceae

Sl. No.	Scientific Name	Local Name	Habit	Family
11.	*Suaeda maritima*	Alur	Herb	Chenopodiaceae
12.	*Tribulus terrestris*	Gokhru	Climber	Zygophyllaceae

It was observed that, many of these species were present in the dunes zones. Intertidal and beyond intertidal zone showed very little diversity with respect to flora. In order to understand the distribution patterns of plants in the study area were determined. The relative frequency, relative density and relative abundance of these plants were calculated in order to understand plant ecology and distribution.

Prosopis juliflora was most frequent and dense plant in the project area and on the beach it was seen in almost all sampling points. *Pergularia daemia* was seen in the one of the sampling points was the second most frequent plant in the project area. *Parthenium hysterophorous* was frequently distributed in the project area and was densely found in certain patches on the beach. Grasses viz. *Cynodon dactylon* and *Paspalum spp*. were present at several locations. Herbs that typically occur in the sandy area like *Suaeda maritima* and *Tribulis terrestris* were also seen at beach.

The Relative Frequency, Relative Density and Relative Abundance of the Plants are given in **Table 3.26**.

Table 3.26: Phyto-Sociological Characteristics of Plants found in Project Area

Sl. No.	Scientific Name	Relative Frequency	Relative Density	Relative Abundance
1.	*Acacia nilotica*	5.26	2.33	6.08
2.	*Agave americana*	5.26	5.81	10.14
3.	*Calotropis procera*	5.26	3.49	6.08
4.	*Cynodon dactylon*	10.53	10.47	4.05
5.	*Commelina benghalensis*	5.26	3.49	4.05
6.	*Leucaena leucocephala*	5.26	2.33	4.05
7.	*Parthenium hysterophorus*	10.53	13.95	12.16
8.	*Paspalum spp.*	5.26	8.14	14.19
9.	*Pergularia daemia*	10.53	8.14	7.10
10.	*Prosopis juliflora*	15.79	18.60	10.80
11.	*Suaeda maritima*	10.53	12.79	11.15
12.	*Tribulus terrestris*	10.53	10.47	9.12

Project Area Fauna

The proposed expansion project site is located on remote beach with sparse vegetation. During day-time fresh spoor of jackals, Nilgai and mongoose were observed. Twenty-two species of birds were also observed in the project area. The fauna found in the project site are listed in **Table 3.27**.

Table 3.27: Fauna Found in Project Site

Sl. No.	Common Name	Scientific Name	Schedule of Wild Life Protection Act in Which Listed
Mammals			
1.	Common Mongoose	*Herpestres edwardsii*	IV
2.	Jackal	*Canis aureus*	II
3.	Indian Fox	*Vulpes bengalensis*	II
4.	Common house rat	*Rattus rattus*	V
5.	Nilgai	*Boselaphus tragocamelus*	III
6.	Squirrel	*Funambulus pennanti*	IV
Birds			
1	Red Wattled Lapwing	*Vannelus indica*	IV
2	Indian Reef Heron	*Egretta gularis*	IV
3	Whimbrel	*Numenius phaeopus*	IV
4	Common Sandpiper	*Tringa hypoleucos*	IV
5	Pariah Kite	*Milvus migrans*	-
6	Common Crow	*Corvus splendens*	V
7	Grey Partridge	*Francolinus pondicerianus*	IV
8	Black Ibis	*Pseudibis papillosa*	IV
9	White Ibis	*Theskiornis aethiopica*	IV
10	Painted Stork	*Mycteria leucocephala*	IV
11	Little Egret	*Egretta garzetta*	IV
12	Drongo	*Dicrurus adsimilis*	IV
13	Koel	*Eudynamis scolopacea*	IV
14	House Swift	*Apus affinis*	IV
15	White Breasted Kingfisher	*Halcyon smyrnensis*	IV
16	Jungle Babbler	*Turdoides striatus*	IV
17	Large Grey Babbler	*Turdoides molcolmi*	IV
18	Green Bee-eater	*Merops orientalis*	IV
19	Chestnut Headed Bee-eater	*Merops leschenaulti*	IV
20	Shrike	*Lanius spp.*	IV
21	Common Tern	*Sterna hindo*	IV
22	Brahminy Kite	*Haliastur indus*	IV
23	Brahminy Mynah	*Sturnus pagodarum*	IV
24	Red Vent Bulbul	*Pycnonotus cafer*	IV
25	Small Indian Cormorant	*Phalacrocorax niger*	IV
26	Kentish Plover	*Charadius alexandrinus*	IV
27	Black Winged Stilt	*Himantopus himantopus*	IV

Study Area Flora

The study area comprises of agricultural land, barren / waste land, grazing land, scrub vegetation, tidal creeks and settlements.

The plants found naturally in the study area are listed in **Table 3.28**.

Table 3.28: List of Plants Found Naturally in the Study Area

Sl. No.	Scientific Name	Local Name	Habit	Family
1.	*Abrus precatorius*	Chanothi	Climber	Papilionaceae
2.	*Abutilon glaucum*	Makamali	Under-shrub	Malvaceae
3.	*Abutilon indicum*	Khapat	Under-shrub	Malvaceae
4.	*Acacia leucophloea*	Harmo-baval	Tree	Mimosaceae
5.	*Acacia nilotica*	Bhaval	Tree	Mimosaceae
6.	*Acacia tortillis*	-	Tree	Mimosaceae
7.	*Achyranthes aspera*	Aghedo	Herb	Amaranthaceae
8.	*Agave americana*	Ketki	Under-shrub	Agavaceae
9.	*Ailanthus excelsa*	Araduso	Tree	Simarubiaceae
10.	*Albizzia lebbeck*	Siris	Tree	Mimosaceae
11.	*Alhagi pseudalhagi*	Javaso	Under-shrub	Papilionaceae
12.	*Alysicarpus longifolius*	Moto-samarvo	Herb	Papilionaceae
13.	*Alysicarpus vaginalis*	Zinko-samarvo	Herb	Papilionaceae
14.	*Amaranthus spinosus*	Kantalo-dambho	Herb	Amaranthaceae
15.	*Amaranthus viridis*	Dhimdo	Herb	Amaranthaceae
16.	*Anagallis arvensis*	Ratifudardi	Herb	Primulaceae
17.	*Apluda mutica*	Fulari ga	Grass	Poaceae
18.	*Argemone mexicana*	Darudi	Herb	Papavaraceae
19.	*Aristida adscensionis*	Lapdo	Grass	Poaceae
20.	*Aristida funiculate*	Laso lambh	Grass	Poaceae
21.	*Aristolochia bractcolata*	Kidamari	Herb	Aristolochiaceae
22.	*Asparagus dumosus*	Satavari	Climber	Liliaceae
23.	*Azadirachta indica*	Neem, Limdo	Tree	Meliaceae
24.	*Balanites aegyptica*	Ingoriyo	Small tree	Simarubiaceae
25.	*Barleria prionitis*	Kanthselio	Under-shrub	Acanthaceae
26.	*Boerhavia diffusa*	Punamava	Herb	Nyctaginaceae
27.	*Boerhavia verticillata*	Punamava	Herb	Nyctaginaceae
28.	*Borreria articularis*	Madhuri-jadi	Herb	Rubiaceae
29.	*Borreria stricta*	-	Herb	Rubiaceae
30.	*Brachiaria racemosa*	Kanzeru	Grass	Poaceae
31.	*Butea monosperma*	Kesudo	Small tree	Papilionaceae
32.	*Caesalpinia crista*	Kachaka	Shrub	Caesalpiniaceae
33.	*Calotropis procera*	Ankado	Shrub	Asclepiadaceae
34.	*Capparis decidua*	Kerdo	Shrub	Capparaceae
35.	*Capparis sepiaria*	Kanthar	Shrub	Capparaceae
36.	*Cardiospermum halicacabum*	Kagdolio	Climber	Sapindaceae
37.	*Cassia auriculata*	Aval	Shrub	Caesalpiniaceae
38.	*Cassia pumila*	Nani-chimed	Herb	Caesalpiniaceae
39.	*Cassia siamea*	Kesia	Tree	Caesalpiniaceae
40.	*Cassia tora*	Kuvandio	Herb	Caesalpiniaceae

Sl. No.	Scientific Name	Local Name	Habit	Family
41.	*Celosia argentata*	Lampdi	Herb	Amaranthaceae
42.	*Celosia cristata*	Mor-shikha	Herb	Amaranthaceae
43.	*Cenchus biflorus*	-	Grass	Poaceae
44.	*Cenchus ciliaris*	Anjan	Grass	Poaceae
45.	*Cenchus setigerus*	Dhaman gha	Grass	Poaceae
46.	*Chenopodium album*	Chilni-bhaji	Herb	Chenopodiaceae
47.	*Chenopodium murale*	Barelo	Herb	Chenopodiaceae
48.	*Chloris varigata*	Punjaniu ga	Grass	Poaceae
49.	*Chrysopogon fulvus*	Kharalu	Grass	Poaceae
50.	*Cicer arietimum*	Chana	Herb	Papilionaceae
51.	*Cissus quadrangularis*	Hadsankal	Climber	Vitaceae
52.	*Cleome simplicifolia*	Talwani	Herb	Capparaceae
53.	*Clitoria teurnatea*	Bibari	Herb	Papilionaceae
54.	*Coccinia grandis*	Tindora	Climber	Cucurbitaceae
55.	*Cocculus hirsutus*	Vagval, Asipal	Straggling shrub	Menispermaceae
56.	*Cocculus pendulus*	Vevadi	Semi-erect under-shrub	Menispermaceae
57.	*Commelina benghalensis*	Shishmuliyan	Herb	Commelinaceae
58.	*Commelina diffusa*	Shishmuliyan	Herb	Commelinaceae
59.	*Convolvulus arvensis*	Phudardi	Herb	Convolvulaceae
60.	*Convolvulus auricomus*	Ruchhadi-veldi	Climbing Herb	Convolvulaceae
61.	*Convolvulus microphyllus*	Shankhavali	Herb	Convolvulaceae
62.	*Corchorus aestuans*	Chhaunch	Under-shrub	Tiliaceae
63.	*Corchorus depressus*	Zinki Chh	Under-shrub	Tiliaceae
64.	*Corchorus fascicularis*	Chhunch	Under-shrub	Tiliaceae
65.	*Corchorus trilocularis*	Chhunch	Under-shrub	Tiliaceae
66.	*Cordia gharaf*	Liyar gundi	Tree	Ehretiaceae
67.	*Cressa cretica*	Paliyo	Herb	Convolvulaceae
68.	*Crotalaria burhia*	Shan	Under-shrub	Papilionaceae
69.	*Ctenolepis cerasiformis*	Aankh-phutamani	Climber	Cucurbitaceae
70.	*Cynodon dactylon*	Dhroknad	Grass	Poaceae
71.	*Cyperus rotundus*	Moth	Sedge	Cyperaceae
72.	*Dactyloctenium aegypticum*	Kagatango gha	Grass	Poaceae
73.	*Dactyloctenium sindicum*	Chund gha	Grass	Poaceae
74.	*Dalbergia sissoo*	Shisham	Tree	Papilionaceae
75.	*Dalechampia scandens*	Khijavani-vel	Climber	Euphorbiaceae
76.	*Datura metel*	Dhaturo	Under-shrub	Solanaceae
77.	*Desmostachya bipinnata*	Dhab	Grass	Poaceae
78.	*Derris indica*	Karang	Tree	Papilionaceae
79.	*Dichanthium annulatum*	Jinjavo	Grass	Poaceae
80.	*Digera muricata*	Kanejaro	Herb	Amaranthaceae

Sl. No.	Scientific Name	Local Name	Habit	Family
81.	*Echinops echinatus*	Utkantho	Herb	Asteraceae
82.	*Eclipta alba*	Bhangro	Herb	Asteraceae
83.	*Eragrostis ciliare*	Mamar	Grass	Poaceae
84.	*Eragrostis inella*	Lamar	Grass	Poaceae
85.	*Eragrostis unioloides*	Chakaladum	Grass	Poaceae
86.	*Eragrostis viscosa*	-	Grass	Poaceae
87.	*Euphorbia hirta*	Rati-dudheli	Herb	Euphorbiaceae
88.	*Euphorbia nelvulia*	Nad thor	Shrub	Euphorbiaceae
89.	*Euphorbia prostrata*	-	Herb	Euphorbiaceae
90.	*Euphorbia pulcherimma*	Lal-patti	Under-shrub	Euphorbiaceae
91.	*Euphorbia thymifolia*	Nani-dudheli	Herb	Euphorbiaceae
92.	*Euphorbia tirucalli*	Kharsani	Herb	Euphorbiaceae
93.	*Evolvulus alsinoides*	Kali-sankhavali	Herb	Convolvulaceae
94.	*Fagonia cretica*	Dhamaso	Under-shrub	Zygophyllaceae
95.	*Ficus bengalensis*	Vad	Tree	Moraceae
96.	*Ficus racemosa*	Umbaro-guler	Tree	Moraceae
97.	*Ficus religiosa*	Piplo	Tree	Moraceae
98.	*Fluggea leucopyra*	Thumari	Shrub	Euphorbiaceae
99.	*Gloriosa superba*	Kankasani	Herb	Liliaceae
100.	*Goniogyna hirta*	Adadiyo	Herb	Fabaceae
101.	*Grewia tenax*	Gangeti	Shrub	Tiliaceae
102.	*Hewittia sublobata*	-	Herb	Convolvulaceae
103.	*Hibiscus cannabinus*	Amboi	Under-shrub	Malvaceae
104.	*Hibiscus micranthus*	Chanak-bhindo	Under-shrub	Malvaceae
105.	*Indigofera cordifolia*	Gadar gari	Herb	Fabaceae
106.	*Indigofera linnaei*	Bhoigali	Herb	Fabaceae
107.	*Indigofera obligifolia*	Ziladi	Under-shrub	Fabaceae
108.	*Indigofera otinctoria*	Gali	Under-shrub	Fabaceae
109.	*Ipomea carica*	Moti-fudard	Climber	Convolvulaceae
110.	*Ipomea fistulosa*	-	Under-shrub	Convolvulaceae
111.	*Ipomea pes-caprae*	Arvel	Straggling herb	Convolvulaceae
112.	*Jatropha curcas*	Ratan jyot	Shrub	Euphorbiaceae
113.	*Jatropha gossypifolia*	Vilayti aranda	Shrub	Euphorbiaceae
114.	*Justicia simplex*	-	Herb	Acanthaceae
115.	*Lantana camara*	Indradhanu	Shrub	Verbenaceae
116.	*Launea procumbens*	Moti	Herb	Asteraceae
117.	*Launea sarmentosa*	Bhoipatri	Herb	Asteraceae
118.	*Lepidognathis cuspidata*	Paneru	Under-shrub	Acanthaceae
119.	*Lepidognathis trinervis*	Paneru	Under-shrub	Acanthaceae
120.	*Leptadenia pyrotechnica*	Khip	Under-shrub	Asclepiadaceae
121.	*Leptadenia reticulate*	Nani-dedi	Twiner	Asclepiadaceae

Sl. No.	Scientific Name	Local Name	Habit	Family
122.	*Leucaena leucocephala*	Subabul	Tree	Fabaceae
123.	*Luffa acutangula*	Turiyon	Climber	Cucurbitaceae
124.	*Mangifera indica*	Keri	Tree	Anacardiaceae
125.	*Melanocenchrus spp.*	-	Grass	Poaceae
126.	*Merremia gangetica*	Undat-kani	Herb	Convolvulaceae
127.	*Mimosa hamata*	Kaibaval	Under-shrub	Fabaceae
128.	*Mucuna prurita*	Kuvech	Herb	Fabaceae
129.	*Mukia maderaspatana*	Chimbhadi	Climber	Cucurbitaceae
130.	*Ocimum basilicum*	Tak-maria	Under-shrub	Labiateae
131.	*Ocimum sanctum*	Tulsi	Under-shrub	Labiateae
132.	*Opuntia elatior*	Fafdo thor	Shrub	Cactaceae
133.	*Parthenium hysterophorus*	-	Herb	Asteraceae
134.	*Paspalum spp.*	-	Grass	Poaceae
135.	*Pedalia murex*	Gokharum	Under-shrub	Pedaliaceae
136.	*Penatropis spiralis*	Shingroti	Twiner	Asclepiadaceae
137.	*Pergularia daemia*	Chamar dudheli	Climber	Asclepiadaceae
138.	*Peristrophe bicalyculata*	Kali ghadhedi	Herb	Acanthaceae
139.	*Phoenix sylvestris*	Khajuri	Tree	Arecaceae
140.	*Phyllanthus niuri*	Bhoi ambli	Herb	Euphorbiaceae
141.	*Phyllanthus maderaspatensis*	-	Herb	Euphorbiaceae
142.	*Physalis longifolia*	-	Herb	Solanaceae
143.	*Physalisminima*	Popati	Herb	Solanaceae
144.	*Polycarpaea corymbosa*	Ful-chagaro	Herb	Caryophyllaceae
145.	*Polycarpaea spicata*	Vajradanti	Herb	Caryophyllaceae
146.	*Portulaca oleracea*	Luni	Herb	Portulacaceae
147.	*Polygala chilensis*	Pili-bhoyasan	Herb	Polygalaceae
148.	*Polygala erioptera*	Bhoyasan	Herb	Polygalaceae
149.	*Prosopis juliflora*	Gando baval	Small tree	Mimosaceae
150.	*Prosopis cineraria*	Khijdo	Tree	Mimosaceae
151.	*Pulicaria wightiana*	Sonosaliya	Herb	Asteraceae
152.	*Pupalia lappacea*	Zipto	Herb	Amaranthaceae
153.	*Rhynchosia minima*	Nani-kamalvel	Twiner	Fabaceae
154.	*Rivea hypocrateriformis*	Fang	Climbing Shrub	Convolvulaceae
155.	*Rivea ornata*	Fang	Climbing Shrub	Convolvulaceae
156.	*Salvadora persica*	Piludi	Shrub	Salvadoraceae
157.	*Sesamum laciniatum*	Vagadau-tal	Herb	Pedliaceae
158.	*Sesbania bispinosa*	Ikad	Herb	Fabaceae
159.	*Saccharum officinarum*	Wad	Grass	Poaceae
160.	*Scirpus articulatus*	-	Grass / Herb	Cyperaceae
161.	*Sida acuta*	Bala	Under-shrub	Malvaceae
162.	*Sida alba*	Kantali-bala	Under-shrub	Malvaceae

Sl. No.	Scientific Name	Local Name	Habit	Family
163.	*Sida cordata*	Bhoibala	Herb	Malvaceae
164.	*Sida cordifolia*	Mahabala	Under-shrub	Malvaceae
165.	*Sida ovata*	Bala	Under-shrub	Malvaceae
166.	*Solanum melongena*	Ringana	Herb	Solanaceae
167.	*Solanumnigrum*	Piludi	Herb	Solanaceae
168.	*Solanumsurattense*	Bhoi-ringani	Herb	Solanaceae
169.	*Suaeda maritima*	Alur	Herb	Chenopodiaceae
170.	*Syzigium cuminii*	Jambu	Tree	Myrtaceae
171.	*Tamarindus indica*	Ambli	Tree	Caesalpiniaceae
172.	*Tephrosia purpurea*	Sarpankho	Under-shrub	Fabaceae
173.	*Tephrosia strigosa*	Zinko-Sarpankho	Herb	Fabaceae
174.	*Thespesia populnea*	Paras-piplo	Tree	Malvaceae
175.	*Tinospora cordifolia*	-	Shrub	Menispermaceae
176.	*Trianthema portulacastrum*	Satodo	Herb	Aizoceae
177.	*Tribulus terrestris*	Gokhru	Climber	Zygophyllaceae
178.	*Trichodesma indicum*	Undha-fuli	Herb	Boraginaceae
179.	*Trichodesma zeylanicum*	Undha-fuli	Herb	Boraginaceae
180.	*Tridax procumbens*	Pardeshi bhangro	Herb	Asteraceae
181.	*Triumfetta rhomboidea*	Zipti	Under-shrub	Tiliaceae
182.	*Triumfetta rotundifolia*	Zipto	Under-shrub	Tiliaceae
183.	*Typha angustifolia*	Gha-bajarium	Sedge	Typhaceae
184.	*Vernonia cinerea*	Shahadevi	Herb	Asteraceae
185.	*Vitex negundo*	Nagod	Shrub	Verbenaceae
186.	*Xanthium indicum*	Gadarivum	Herb	Asteraceae
187.	*Xeromphis uliginosa*	Ganjeda	Shrub	Rubiaceae
188.	*Zizyphus globerrima*	-	Tree	Rhamnaceae
189.	*Zizyphus glabrata*	-	Tree	Rhamnaceae
190.	*Zizyphus mauritiana*	Khareki bor	Small Tree	Rhamnaceae
191.	*Zizyphus nummularia*	Chani-bor	Shrub	Rhamnaceae
192.	*Zornia gibbosa*	-	Herb	Fabaceae

There is an undulating expanse of sandy area just beyond the project area whose vegetation consists of a *Prosopis juliflora, Acacia nilotica* few other tree species, shrubs, herbs and grasses.

The vegetation of the barren lands and scrub lands consists of *Acacia spp. Prosopis juliflora, Azadirachta indica* and other xerophytic species, whose density depends on the soil cover. *Parthenium, Argemone Mexicana, Jatropha* and *Calotropis* are observed growing along road sides.

The vegetation in and around settlements consists of trees like *Acacia spp., Prosopis juliflora, Azadirachta indica,* shrubs, grasses etc. Many of the *Azadirachta indica* trees have probably been planted by local villagers.

Fauna

The animals found in the study area are listed in **Table 3.29**.

Table 3.29: List of Terrestrial Animals found in the Study Area

Sl. No.	Common Name	Scientific Name	Schedule of Wild Life Protection Act in Which Listed
Mammals			
1.	Common Mongoose	*Herpestres edwardsii*	IV
2.	Jackal	*Canis aureus*	II
3.	Indian Fox	*Vulpes bengalensis*	II
4.	Common house rat	*Rattus rattus*	V
5	Nilgai	*Boselaphus tragocamelus*	III
6	Squirrel	*Funambulus pennanti*	IV
8	Fulvous fruit bat	*Rousettus leschnaulti*	
Reptiles			
1.	Wall Lizard	*Hemidactylus spp.*	-
2.	Cobra	*Naja naja*	II
3.	Yellow Rat Snake	*Ptyas mucosus*	II
4.	Common Skink	*Mabuya carinata*	II
5	Garden Lizard	*Calotes versicolor*	-
Birds			
1	Pariah Kite	*Milvus migrans*	-
2	Common Crow	*Corvus splendens*	V
3	Grey Partridge	*Francolinus pondicerianus*	IV
4	House Sparrow	*Passer domesticus*	-
5	White Wagtail	*Motacilla alba*	IV
6	Grey Wagtail	*Motacilla cineara*	IV
7	Common Tailorbird	*Orthotomus sutorius*	IV
8	Drongo	*Dicrurus adsimilis*	IV
9	Crow Pheasant	*Centropus sinensis*	IV
10	Blue Jay / Indian Roller	*Coracias benghalensis*	IV
11	White eared Bulbul	*Pycnonotus leucotis*	IV
12	Red Vent Bulbul	*Pycnonotus cafer*	IV
13	Koel	*Eudynamis scolopacea*	IV
14	Pegion	*Columba livia*	IV
15	Indian Ring Dove	*Streptopelia decacto*	IV
16	Red Turtle Dove	*Streptopelia tranquebarica*	IV
17	Black Winged Kite	*Elanus caeruleus*	IV
18	Jungle Babbler	*Turdoides striatus*	IV
19	Common Babbler	*Turdoides caudatus*	IV
20	Large Grey Babbler	*Turdoides malcolmi*	IV
21	Hoopoe	*Upupa epops*	IV
22	White Throated Munia	*Lonchura malabarica*	IV
23	Indian Robin	*Saxicoloides fulicata*	IV

Sl. No.	Common Name	Scientific Name	Schedule of Wild Life Protection Act in Which Listed
24	Ashy Wren warbler	*Prinia socialis*	IV
25	Franklin's Wren warbler	*Prinia hodgsonii*	IV
26	Shikra	*Accipiter badius*	IV
27	House Swift	*Apus affinis*	IV
28	Green Bee-eater	*Merops orientalis*	IV
29	Blue Cheeked Bee-eater	*Merops persica*	IV
30	Bay-backed Shrike	*Lanius vittatus*	IV
31	Magpie Robin	*Copsychus saularis*	IV
32	Grey Shrike	*Lanius excubitor*	IV
33	Barn Swallow	*Hirindo rustica*	IV
34	Wire Tailed Swallow	*Hirundo smithii*	IV
35	Painted Stork	*Mycteria leucocepahala*	IV
36	Little Tern	*Sterna albifrons*	IV
37	Common Tern	*Sterna hindo*	IV
38	Booted Warbler	*Hippolais caligata*	IV
39	Paddyfield warbler	*Acrocephala agricola*	IV
40	Crested Lark	*Galerida cristata*	IV
41	Malabar Crested Lark	*Galerida malabarica*	IV
42	Ashy Crowned Finch Lark	*Eremopterix grisea*	IV
43	Sand Lark	*Calandrella raytal*	IV
44	Red Wattled Lapwing	*Vannelus indica*	IV
45	Black Winged Stilt	*Himantopus himantopus*	IV
46	White Breasted Kingfisher	*Halcyon smyrnensis*	IV
47	Intermediate Egret	*Egretta intermedia*	IV
48	Cattle Egret	*Bubulcus ibis*	IV
49	Little Egret	*Egretta garzetta*	IV
50	Indian Reef Heron	*Egretta gularis*	IV
51	Pond Heron	*Ardeola grayii*	IV
52	Small Indian Cormorant	*Phalacrocorax niger*	IV
53	Whimbrel	*Numenius phaeopus*	IV
54	Common Sandpiper	*Tringa hypoleucos*	IV
55	Stone Curlew	*Burhinus oedicnemus*	IV
56	Black Ibis	*Pseudibis papillosa*	IV
57	White Ibis	*Theskiornis aethiopica*	IV
58	Spoonbill	*Palatea leucocordia*	IV
59	Grey Heron	*Ardea cinerea*	IV
60	River Tern	*Sterna aurantia*	IV
61	Brahminy Kite	*Haliastur indus*	IV
62	Brahminy Mynah	*Sturnus pagodarum*	IV
63	Kentish Plover	*Charadius alexandrinus*	IV

Due to lack of suitable habitat diversity of mammals is low. But the diversity of birds is high, which is also helped by the fact that local villagers protect wildlife.

3.4.5.2 Marine Ecology

Plankton and benthos samples were collected from the sea at five line transects, each with three sampling points, 100 m off HTL, ~500 m off HTL and ~2-2.5 km offshore. The locations of the transects are listed in **Table 3.30**.

Table 3.30: Marine Ecological Sampling locations

Sl. No.	Location	Stn. No.	Distance from project area
1	Opposite Jaspara	A	~3.5 km north-east
2	Yard Off Sosiya	B	-
3	Yard Near Alang Fire Station	C	-
4	Yard off existing southernmost plot	D	-
5	Near Proposed Dry-Dock-2 Site	E	~2 km South-west of existing yard

Phyto-Plankton

The composition of the phytoplankton community is given in **Table 3.31**.

Table 3.31: Composition of Phytoplankton Community in Sea Water

Stations 0.1 km, 0.5 km, ~2 km		Phytoplankton genera			Shannon Weaver Index
Station A	0.1 km offshore	*Navicula spp.*	*Coscinodiscus spp*	*Nitzschia spp.*	0.99
	0.5 km offshore	*Navicula spp.*	*Coscinodiscus spp*	*Nitzschia spp.*	0.99
	~2 km offshore	*Navicula spp.*	*Coscinodiscus spp*	*Nitzschia spp.*	0.90
Station B	0.1 km offshore	*Navicula spp.*	*Coscinodiscus spp*	*Nitzschia spp.*	0.96
	0.5 km offshore	*Navicula spp.*	*Coscinodiscus spp*	*Nitzschia spp.*	0.96
	~2 km offshore	*Navicula spp.*	*Coscinodiscus spp*	*Nitzschia spp.*	0.68
Station C	0.1 km offshore	*Navicula spp.*	*Coscinodiscus spp*	*Nitzschia spp.*	0.80
	0.5 km offshore	*Navicula spp.*	*Coscinodiscus spp*	*Nitzschia spp.*	0.80
	~2 km offshore	*Navicula spp.*	*Coscinodiscus spp*	*Nitzschia spp.*	0.68
Station D	0.1 km offshore	*Navicula spp.*	*Coscinodiscus spp*		0.69
	0.5 km offshore	*Navicula spp.*	*Coscinodiscus spp*		0.69
	~2 km offshore	*Navicula spp.*	*Coscinodiscus spp*	*Surirella spp.*	0.68
Station E	0.1 km offshore	*Navicula spp*	*Coscinodiscus spp*		0.50
	0.5 km offshore	*Navicula spp*	*Coscinodiscus spp*		0.50
	~2 km offshore	*Navicula spp*	*Coscinodiscus spp*		0.45

The species diversity was poor and showed the presence of *Navicula spp*. and *Nitzschia spp*.as dominant species occurring at stations. At station D the sample from 1.5 km from the shore showed the presence of *Surirella spp.*

Primary Productivity in sea water are given in **Table. 3.32**.

Table 3.32: Primary Productivity Levels in Sea Water

Primary productivity mg C /L/day						
Station		**NPP*/day**	**GPP**/day**	**Temp(℃)**	**pH**	**Salinity (ppt)**
A	0.5 km offshore	0.03	0.08	31.7	7.5	38
	~2 km offshore	0.05	0.08	34.1	7.5	34
B	0.5 km offshore	0.09	0.27	31.5	7.5	38
	~2 km offshore	0.13	0.45	34	7.5	34
C	0.5 km offshore	0.13	0.28	31.7	7.5	37
	~2 km offshore	0.03	0.28	34.2	7.5	33
D	0.5 km offshore	0.11	0.17	31.6	7.5	38
	~2 km offshore	0.13	0.53	34.1	7.5	34
E	0.5 km offshore	0.16	0.27	31.4	7.5	38
	~2 km offshore	0.05	0.25	34	7.5	34
**NPP : Net primary productivity; **GPP: Gross primary productivity*						

Zoo-Plankton

Results of studies of the zoo-plankton community are given in **Tables 3.33.**

Table 3.33: Composition of Zooplankton Community in Sea Water

Stations 0.1 km, 0.5 km, ~2 km		**Zooplankton Groups**			**Shannon Weaver Index**
Station A	0.1 km offshore	-	-	-	-
	0.5 km offshore	-	-	-	-
	~2 km offshore	Foramenifera	-	-	-
Station B	0.1 km offshore	-	-	-	-
	0.5 km offshore	-	-	-	-
	~2 km offshore	Copepods	Decapods	-	0.41
Station C	0.1 km offshore	Copepods	-	-	-
	0.5 km offshore	Copepods	-	-	-
	~2 km offshore	-	-	-	-
Station D	0.1 km offshore	Copepods	Foramenifera	-	0.64
	0.5 km offshore	Copepods	Foramenifera	-	0.64
	~2 km offshore	Copepods	-	-	-
Station E	0.1 km offshore	Copepods	Polychaeta	Gastropods	1.04
	0.5 km offshore	Copepods	Polychaeta	Gastropods	1.04
	~2 km offshore	Copepods	Polychaeta	Foramenifera	0.80

The diversity of zooplankton was found to be poor. The biomass and Shannon Weaver index were also less. However Station E showed maximum number of groups (4) as compared to all other stations. Stations E100 and 500 showed highest biodiversity (Shannon Weaver Index: -1.04).

Benthos

Results of studies of the benthic community are given in **Table 3.34.** Polychaete worms are the dominant group**.**

Table 3. 34: Composition of Zooplankton Community in Sea Water

Stations 0.1 km, 0.5 km, ~2 km		**Benthic Groups**		**Total Biomass (g/m^2)**	**Shannon Weaver Index**
Station A	0.1 km offshore	-	-	-	-
	0.5 km offshore	Polychaeta	Bivalves	5.5	0.27
	~2 km offshore	-	-	-	-
Station B	0.1 km offshore	Polychaeta	-	0.1	-
	0.5 km offshore	Polychaeta	-	0.1	-
	~2 km offshore	Polychaeta	-	0.05	-
Station C	0.1 km offshore	Polychaeta	-	0.1	-
	0.5 km offshore	Polychaeta	-	0.1	-
	~2 km offshore	Polychaeta	-	1.8	-
Station D	0.1 km offshore	-	-	-	-
	0.5 km offshore	-	-	-	
	~2 km offshore	Polychaeta	Crabs	27.8	0.37
Station E	0.1 km offshore	-	-	-	
	0.5 km offshore	-	-	-	-
	~2 km offshore	Polychaeta	Crabs	4.5	0.53

Biomass and bio-diversity of benthic fauna was low probably due to the strong currents, and rocky substratum.

Beach Flora and Fauna

At some places there were rocks in the inter-tidal zone. However marine algae were more or less absent. Only *Enteromorpha* was found in small scattered clumps on rocks at Stations B and D (i.e. at the existing northern and southern ends of the yard). The benthic animals found at the various stations are as follows:

Table 3.35: Fauna of Intertidal Zone

Station	**Fauna Present**
Opposite Jaspara	*Neries,* Gastropods (*Trochus spp., Telescopium spp *),* Bivalve (*Donax spp.*, *Sunetta spp.*),* Rock Oyster*, Fiddler Crab, Hermit Crabs
Yard Off Sosiya	Gastropods (*Trochus spp., Pseudomoris spp., Clavus spp.*) Acorn Barnacles (*Balanus spp.*), Rock Oyster, Pistol Shrimp, Goby fish (*Parachaeturichthy spp.*)
Yard Near Alang Fire Station	Gastropods (*Cerithidae spp.*),* Bivalve (*Donax spp.*), Polychaete colonies
Yard off existing southern most plot	Polychaete colonies, Gastropods (*Trochus sps, Clavus spp*, Cerithium spp* , Clypeomorus spp.**), Sea Slugs (*Sedadoris sps*), Crabs (*Matuta lunaris, Graspus spp, Macropthalamus spp.*)

Station	Fauna Present
Near Proposed Dry-Dock 2 Site	Polychaete colonies, Gastropods (*Trochus sps, Cerithium spp**), Bivalve (*Donax spp*.)
**Dead / Empty shells only*	

In order to determine the bio-accumulation of heavy metals in animals, muscles of the crab,*Matuta lunaris*, collected form the SRY were dissected out and the concentration of Zinc, Lead, Copper, Chromium and Cadmium determined. The results are as follows:

Table 3.36: Heavy Metal Concentration in Crab Muscular Tissue

Metal	Concentration (µg/g)
Zinc	0.23
Lead	0.08
Copper	8.6
Chromium	2.1×10^{-4}
Cadmium	3.2×10^{-5}

Zinc is an essential micro-nutrient and the Recommended Dietary Allowance of Zinc is 8 – 11 mg/day in U.S.A. Copper too is an essential micro-nutrient and the Recommended Dietary Allowance of Copper is 0.97 – 3.0 mg/day. A healthy adult human being contains 1.4 to 2.1 mg/kg of body-weight. The World Health Organization recommends a minimal acceptable intake of approximately 1.3 mg/day. Shellfish (which includes crabs) are considered a good source of dietary copper. Lead, Chromium and Cadmium are toxic. The food and Agriculture Organisation (FAO) permits maxium of 1.5 mg/kg of lead and 0.05 mg/kg of Cadmium in food. The above results indicate that the crab meat is safe to consume.

Nekton

There is no commercial fishing off Alang, but some subsistence fishing during the non-monsoon period. However some commercial fishing is done in Bhavnagar District. The year wise catches since 2009 are as follows:

Table 3.37: Fisheries statistics of Bhavnagar District (2009 – 2014)

Name of Fish	2009	2010	2011	2013	2014	Total	%
Shrimp	647.086	605.560	169.290	166.130	524.508	2112.574	33.16
Prawns (M)	88.411	117.116	38.628	35.648	97.303	377.106	5.92
Prawns (J)	0	0	1.488	0	0	1.488	0.02
Bombay Duck	326.411	148.319	53.194	103.149	147.772	778.845	12.22
Hilsa	235.800	201.790	53.250	85.500	173.724	750.064	11.77
Other Clupeids	180.310	159.620	29.495	62.800	93.655	525.88	8.25
Mullet	190.106	184.380	34.321	34.164	68.851	511.822	8.03
Levta	76.252	78.791	32.166	14.612	33.220	235.041	3.69
Cat fish	71.914	57.478	21.626	11.887	63.067	225.972	3.55
Shark	83.302	51.454	15.910	10.815	53.381	214.862	3.37
Crab	48.875	51.354	15.185	11.916	16.369	143.699	2.26
TOTAL	**1948.467**	**1655.862**	**464.553**	**536.621**	**1271.85**	**5877.353**	
All figures in t							
Source: State Fisheries Deptt., Bhavnagar							

3.5 TRAFFIC DENSITY MEASUREMENT

Traffic density analysis has been carried at Kathava Village on SH-37. Monitoring was carried out on 26th – 27th May, 2015 *(Tuesday-Wednesday)*. Traffic density was recorded at hourly intervals for 24 hours continuously by counting the numbers and types of vehicles passing through the station.

Results

The observations of traffic density analysis station are given in **Table 3.38.**

Table 3.38: Traffic Density

Time	Towards Alang			From Alang			TOTAL
	2 Wheelers	LMVs	HMVs	2 Wheelers	LMVs	HMVs	
0600 – 0700 hrs.	120	84	13	101	80	11	409
0700 – 0800 hrs.	113	78	16	90	66	12	375
0800 – 0900 hrs.	115	72	23	101	54	21	386
0900 – 1000 hrs.	180	92	28	175	68	19	562
1000 – 1100 hrs.	173	96	37	152	82	21	561
1100 – 1200 hrs.	178	94	50	182	57	23	584
1200 – 1300 hrs.	180	82	32	120	72	36	522
1300 – 1400 hrs.	171	72	48	154	67	47	559
1400 – 1500 hrs.	138	165	60	142	72	33	610
1500 – 1600 hrs.	180	141	26	153	80	56	636
1600 – 1700 hrs.	173	85	18	219	142	66	703
1700 – 1800 hrs.	141	47	21	112	130	72	523

Time	Towards Alang			From Alang			TOTAL
	2 Wheelers	LMVs	HMVs	2 Wheelers	LMVs	HMVs	
1800 – 1900 hrs.	101	68	27	137	57	39	429
1900 – 2000 hrs.	130	77	23	122	61	42	455
2000 – 2100 hrs.	111	42	12	87	37	23	312
2100 – 2200 hrs.	80	32	14	69	31	18	244
2200 – 2300 hrs.	32	20	13	20	11	12	108
2300 – 0000 hrs.	120	84	13	101	80	11	409
0000 – 0100 hrs.	12	7	10	19	3	8	59
0100 – 0200 hrs.	11	9	9	10	3	10	52
0200 – 0300 hrs.	9	8	13	19	2	14	65
0300 – 0400 hrs.	23	23	30	17	21	19	133
0400 – 0500 hrs.	77	43	28	41	40	23	252
0500 – 0600 hrs.	98	58	18	81	76	22	353
TOTAL	**2546**	**1495**	**569**	**2323**	**1312**	**647**	**8892**

3.6 SOCIO-ECONOMIC STUDY

The proposed upgradation and expansion of the existing ship-recycling project is expected to introduce a set of new activities, which will definitely influence socio-economic condition of the people of the area surrounding it. Such impacts may be marginal or non-marginal depending on the extent of change caused by the project to alter the existing equilibrium of the socio-economic system. The present project is likely to bring benefits for the local people. However, possibility of certain obvious hardships having social cost cannot also be ruled out.

With this background, the present socio-economic impact assessment of the project has been carried out with respect to the following objectives :

- To assess the impact of the project on the pattern of demand;
- To estimate employment and income effects of the project;
- To ascertain the impact of the project on the consumption behaviour;
- To explore the impact of the project on educational status;
- To analyse peoples' perception regarding impact of the project.

3.6.1 Brief Outline of the Study Area

As stated earlier, the study area (5 km radius area) covers ~220 sq. km around the proposed site, of which about half is within the sea.

The entire study area falls under Talaja Tehsil of Bhavnagar district of Gujarat. Basic statistics of the study area are given in **Table 3.39**.

Table 3.39: Basic statistics of Study Area

Sl No	Item	Unit	Study Area
1	Population Total Male Female	Nos.	 56972 37028 19944
2	Sex Ratio	Female / 1000 Males	538.6
3	SC	Nos.	914
4	ST	Nos.	47
5	Literacy rate	%	65.85
6	Total main workers	Nos.	31540
7	Occupational pattern of the main work force Cultivators Agricultural labourers Household industry Others	Nos.	 5162 5854 222 20302
8	Marginal workers		2300

Source :Census 2011

Total population of the study area as recorded in 2011 census is 56972. The sex ratio in the study area is only ~539 females per 1000 males. This is because of very few females in Alang-Sosiya town, which is a shanty town populated mainly by workers of the Ship Recycling Yard. In this town, the number of women is only 1171 out 17309 (i.e. only ~68 females for every 1000 males). For other villages, the sex ratio varies from 957 to 1219 (average 1054) females per 1000 males. SC and ST categories constitute ~1.6% and ~0.08% of the population respectively. Literacy rate is poor (only 65.85%). Working population constitute 59.57% of the total population. Main and marginal workers constitute 55.36% and 4.04% of total population respectively. It may be noted that of that ~64.4% of the main workers are classified as "Other Main Workers" i.e. they are mostly engaged in ship-recycling and allied activities. Details of village-wise demographic pattern of the study area are given in **Table 3.40**.

Table 3.40: Details of village-wise demographic pattern

Sl. No.	Village	No. of Household	Total Population	Total Male	Total Female	SC	ST	Literate	Male Literate	Female Literate	Illiterate	Male Illiterate	Female Illiterate	Working Population	Main Worker	Main Cultivator	Main Agri worker	Main Household Industry	Main Others	Marginal Worker	Non Working population
1	Alang-Sosiya	5175	18480	17309	1171	59	18	13599	12988	611	4881	4321	560	17131	17037	12	43	98	16884	94	1349
2	Alang (C.T)	1443	8309	4332	3977	342	15	5079	2991	2088	3230	1341	1889	3369	3040	803	1240	13	984	329	4940
3	Bhankhal	158	1089	579	510	8	0	704	396	308	385	183	202	387	362	192	116	0	54	25	702
4	Bharapara	297	1918	938	980	0	0	1128	648	480	790	290	500	974	917	550	223	36	108	57	944
5	Chopada	139	945	501	444	50	0	662	388	274	283	113	170	444	389	114	164	0	111	55	501
6	Goriyali	309	1771	886	885	6	0	1006	607	399	765	279	486	817	692	239	335	1	117	125	954
7	Jaspara	438	2400	1209	1191	3	0	1550	872	678	850	337	513	953	835	488	138	0	209	118	1447
8	Kantala	377	2098	1072	1026	0	0	1341	778	563	757	294	463	1071	691	193	236	0	262	380	1027
9	Kathava	480	2972	1498	1474	0	0	1838	1044	794	1134	454	680	1124	1085	393	208	7	477	39	1848
10	Khadarpar	970	5509	2876	2633	30	8	3282	1958	1324	2227	918	1309	2220	2094	706	1000	36	352	26	3289
11	Mahadevpara	92	597	328	269	0	0	312	204	108	2285	124	161	165	164	59	73	0	32	1	432
12	Mandva	158	1040	522	518	125	0	587	352	235	453	170	283	515	171	38	109	0	24	344	525
13	Mathavda	554	3349	1714	1635	81	0	2162	1303	859	1187	411	776	1831	1338	452	738	13	135	493	1518
14	Padari	450	2592	1288	1304	39	0	1678	948	730	914	340	574	1086	982	269	553	4	156	104	1506
15	Sathara	716	3903	1976	1927	171	6	2590	1473	1117	1313	503	810	1853	1743	654	678	14	397	110	2050
Total of study area		11756	56972	37028	19944	914	47	37518	26950	10568	21454	10078	9376	33940	31540	5162	5854	222	20302	2300	23032

Source :Census 2011

3.6.2 Socio-economic analysis based on sample survey

3.6.2.1 Sampling Design

The study area is divided into four strata. The sample of villages from each stratum as well as the respondent/house-holds within each sampled village has been selected by two stage stratified random sampling. On the first stage; villages from each stratum are selected and on the second stage; households/ respondents are selected from sampled village by simple random sampling. From each selected village, at least two respondents are selected randomly to account intra-village variability among the respondents.

A sample of 26 respondents was surveyed and the sample covers 93 persons.

3.6.2.2 Composition of the questionnaire

Households/respondents were interviewed with the structured questionnaire specifically designed for this study keeping in view the objectives of the study. The questionnaire consists of following major sections :

- Composition and size of family
- Educational status
- Homestead
- Information on agricultural situation (holding size,
- Land use, cropping pattern, productivity, net return etc.)
- Employment (sources of employment)
- Income (income from various sources
- Information on family budget
- Consumption and saving
- Family asset base
- Peoples' willingness to use the proposed road.
- Respondents' perception about the project

Survey Results: Agricultural Situation

Table 3.41 depicts the holding size wise distribution of respondents. The table reveals that most of the respondents are in the "Marginal" category (land holding less than 2.5 acres) while ~7.7% are "Small" land-holders (land holding 2.5 – 5 acres).

Table 3.41: Distribution of households by holding size

Sl. No.	Holding Size (Acre)	Respondents (%)
1.	Landless	0
2.	Marginal : <2.5	24 (92.3)
3.	Small : 2.5 - 5.0	2 (7.7)
4.	Medium : 5.0 - 10.0	0
5.	Large : >= 10.0	0
	TOTAL	100.0

The few farmers in the area grow cotton, groundnuts, wheat and fodder for domestic livestock. There are also fruit orchards and banana plantations.

Agriculture is characterized by multi-crop culture. Due to low rainfall and adequate irrigation mainly dry land crops are cultivated. The major crops are groundnut & sorghum (Kharif) and onions, garlic and wheat (Rabi). Grams and chillies are cultivated as minor crops during the Rabi season. Annual crops are cotton, pigeon peas and sugarcane. There are also banana plantations and orchards of mango, sapota and some other fruits.

General price level of the study area and costs of cultivation are also quite high. With rising costs of cultivation, some of the few remaining farm families are investing some part of the income from other sources e.g. service, wage labour, self-employment, small business, etc. in agriculture so as to obtain higher output.

Survey Results: Sources of Income

Working in the ship recycling yard and allied units and running small business are observed to be main source of income for the people of the study area. Most land holders have sold their land to industries or other land holders and now work as contractors, industrial workers or run small businesses. **Table 3.42** presents the occupational pattern among the surveyed respondents.

Table 3.42: Sources of Income

Sl. No.	Level of Livelihood	No of persons	
1.	Wage Labour	29	(72.50)
2.	Business	8	(20.00)
3.	Service	2	(5.00)
4.	Agriculture	1	(2.50)
Total		40	(100)
Figures in ( ) indicate % in total number of persons			

Survey Results: Pattern of demand

The survey reveals that the respondents spend major portion of their disposable income on food items. However, people are quite exposed to consumer society and there has been a growing tendency among the respondents, of higher and higher expenditure allocation on non-food items than before.

Survey Results: Consumption Behaviour

Table 3.43 presents the source wise distribution of average family consumption. It is observed that the major portion of consumption (~34%) goes to meet the need for food items. This is followed by educational expenses (14.7%) other expenditures (~13%). Average expenditure on education is found to be quite high compared many other Indian states (8.4%). About 23.7% of the income is saved.

Table 3.43 : Source-Wise Distribution of Family Consumption

	Food	Education	Clothing	Medical	Others	Savings	Total
Average family consumption (%)	33.64	14.69	8.61	6.28	13.05	23.73	100

Survey Results: Educational status

The existing educational status of members of the households is depicted in **Table 3.44**. In the surveyed population, other than a few children too young to go to school, everybody has at least primary education. About 33.3% and 11.5% of the members have education at middle school level and high school level respectively. Some of these people are continuing their education at the next higher level. ~8% of the respondents have studied up to +2 level. There were no graduates amongst the respondents. As reported by the respondents, their interest towards education has been increasing due to hope of getting jobs especially in the industries and businesses which are expected to come up in and around Bhavnagar and other industrial areas in Gujarat.

Table 3.44: Educational Status

Sl. No.	Level of education	No of persons	
1.	Illiterate*	0	
2.	Primary	41	(47.13)
3.	Middle schooling	29	(33.33)
4.	High schooling	10	(11.49)
5	Intermediate	7	(8.05)
6.	Graduation	0	
Total		87	(100)

Figures in ( ) indicate % in total number of persons.

*Does not Include children too young to go to school

ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The identified impacts due to ship-recycling associated activities have been studied in relation to the following areas:

- Land environment
- Waste generation
- Solid waste disposal
- Water environment
- Air Environment
- Noise environment
- Biological environment
- Occupational safety and health
- Socio-economics

4.1 LAND ENVIRONMENT

The project will require additional ~10 ha of land. This land comprises of sea beach just beyond the existing SRY and scrubland just beyond the beach. This land is owned by Government of Gujarat.

There is possibility of shore-line changes on account of expansion of the existing SRY. However in this case shoreline changes are unlikely to occur because:

- The existing SRY has been in operation since the early 1980s and there have been no shoreline changes (Refer Chapter 3, Clause 3.3.5).
- The offshore dry-docks will be linked to shore by cause-ways constructed over box culverts to allow free movement of beach sand / mud.

4.2 WASTEGENERATION

The wastes and the substance of concern present in them are given in **Table 4.1.**

Table 4.1: Wastes, Substances of Concern and Disposal Options

Main items of ship	Substances of concern	Appropriate Disposal Option of substances of concern
Gaseous Wastes		
AC Systems, Chilling systems	Refrigerants (CFCs), Ammonia	Recovery by authorized agencies
Firefighting systems	CO_2 cylinders, halons	Recovery by authorized agencies
Cargo tanks and pipelines of oil / chemical tankers, gas carriers	Hydro-carbon gases / chemical fumes	Usually the tanks are purged with inert gas (normally nitrogen) and made gas free when the ship is still far off-shore
Liquid wastes		
Cargo tanks of oil tankers	Residual cargo, oily sludge	Re-use / re-refining / recycling by authorized agencies
Ballast water tanks	Invasive organisms, Oil	Ballast water exchange in high seas, shore based oily water treatment facilities
Bilge spaces	Oil	On-board or shore based oily water treatment facilities

Main items of ship	Substances of concern	Appropriate Disposal Option of substances of concern
Slop tanks of tankers	Oil, chemicals mixed with water	Shore based oily water treatment facilities
Fuel tanks, Oil sumps, Hydraulic systems	Fuel oil, lubricants, oils	Re-use / re-refining / recycling by authorized agencies
	Sludge	Incineration, disposal in secured land fill
	Wash water	Shore based oily water treatment facilities
Solid Wastes		
Bulk-heads Heat exchangers Insulated pipes, valves, gaskets	Asbestos and Asbestos Containing Material (ACM)	Re-use, Disposal in secured land fill after solidification / stabilization
Paint chips	PCBs, Lead, Chromium, Copper, Tributyl tin (TBT)	Disposal in secured land fill
Electrical equipment	PCBs, Lead, Beryllium, PVCs, Copper, Cadmium, Mercury, Antimony, Hexavalent Chromium, Octabromodiphenyl ether (OBDE), Tetrabromo-bisphenol A (TBBPA) etc.	Incineration at high temperature (~1650^{o}C). Disposal in secured land fill after solidification / stabilization. Recycling of lead through authorized recyclers.
Cargo holds	Residual cargo	Disposal in secured land fill
Instruments	Mercury, radioactive materials in smoke detectors	Recovery by distillation; residues disposed off in secured landfills. Radioactive sources disposed as per AERB guidelines

Some of the wastes are likely to be already on board. These wastes have to be handled after beaching / dry-docking. The ship's captain shall hand over a list of wastes already present on board as part of the pre-beaching clearances. A standard format of the advance notification form for waste delivery to port reception facilities following a ship's use of port reception facilities as recommended by Marine Environment Protection Committee, IMO are given at **Annexure 4.1**.

4.3 SOLID WASTE DISPOSAL

The solid wastes generated during the period 2006 – 2015 are given in **Table 4.2**.

Table 4.2: Solid Wastes Generated from Existing SRY during 2006 – 15

Year	Total LDT Recycled	Hazardous Wastes		Municipal Solid Wastes (MSW)	
		Total Hazardous Waste (t)	Kg Hazardous waste / LDT	Total MSW (t)	Kg MSW / LDT
2006 - 07	760800	1032.86	1.357	46.205	0.061
2007 – 08	643437	2017.025	3.134	828.425	1.29
2008 - 09	1944162	5027.84	2.586	855.265	0.44
2009 – 10	2937802	5418.04	1.844	726.175	0.25
2010 – 11	2816236	8215.31	2.917	729.100	0.26
2011 – 12	3847000	8318.98	2.162	552.430	0.144
2012 - 13	3847566	10555.55	2.743	770.550	0.200
2013 - 14	3059891	7505.89	2.451	889.025	0.29
2014 - 15	2490152	7279.395	2.920	305.865	0.12
TOTAL	**22347046**	**55370.89**	**2.478**	**5703.04**	**0.255**

At the proposed project it is expected that 6 Mt/yr of LDT will be handled. Thus based on the above statistics it is expected that on an average ~14900 t/yr of hazardous wastes and ~1550 t/yr of MSW will be generated.

4.3.1 Anticipated Impacts

4.3.1.1 Asbestos and Asbestos Containing Material (ACM)

Asbestos refers to a group of minerals that occur naturally as masses of long silky fibers. Unlike most minerals, which turn into dust particles when crushed, asbestos breaks up into fine microscopic fibers. There are three main types of asbestos fibers:

1. Chrysolite (white asbestos) – fine, silky, flexible white fibers.
2. Amosite (brown asbestos) – straight, brittle, pale brown to light grey fibers; most commonly used asbestos in thermal insulation.
3. Crocidolite (blue asbestos) – straight, blue fibers like tiny needles

Individual asbestos fibers are often mixed with materials that bind them together, forming Asbestos Containing Material (ACM). There are two kinds of ACM:

- Friable ACM is any material containing >1% asbestos that, when dry, may be crumbled, pulverized or reduced to powder by hand.
- Non-friable asbestos is any material containing >1% asbestos that, when dry, may be crumbled, pulverized or reduced to powder by hand. Non-friable asbestos is of 2 kinds:
  - Category I: includes asbestos containing resilient floor coverings, packings and gaskets
  - Category II: includes all other non-friable ACM that is not included in Category I.

Asbestos was widely used in construction and industry because of resistance to abrasion and corrosion, inert to acidic and alkaline solutions, stability at high temperatures, poor electrical and thermal conductivity, non-combustible and strong yet flexible. Asbestos and ACM is found on ships in many types of materials, including, but not limited to:

- Bulk-head and pipe thermal insulation
- Bulkhead fire-shields / fireproofing
- Uptake space insulation
- Exhaust dust insulation
- Weld shop protectors and burn covers, blankets and any firefighting clothing or equipment
- Any other type of thermal insulating material
- Brake linings
- Steam, water and vent flange gaskets
- Sound damping
- Molded plastic products (e.g. switch handles, clutch linings)
- Sealing putty
- Packing in shafts and valves
- Asbestos arc chutes in circuit breakers

When ACM is deteriorated, crushed or otherwise disturbed, asbestos fibers break up into very fine fibers and are released to the environment by either dispersing in the air, floating on water or accumulating on the ground. Because asbestos fibers are small (0.1 – 10 microns long) and light, they easily become airborne and remain so for long periods. People working in asbestos laden air inhale the fibers. Asbestos exposure during ship recycling can occur by:

- Occupational exposure: Most significant asbestos inhalation occurs when workers are engaged in removing asbestos bearing thermal insulation (especially friable asbestos), handling of circuit breakers, cable, cable penetrations, removing asbestos containing floor tiles, handling & removing gaskets with piping and electrical systems as well as molded plastic parts.
- Para occupational exposure: Workers families may inhale asbestos fibers released by their clothes that have been in contact with ACM.
- Neighborhood exposure: People who live or work near asbestos related operations may inhale asbestos fibers that have been released into the air by these operations.

There are several types of lesions associated with asbestos inhalation – fibrosis, carcinoma and mesothelioma (cancer of mesothelial tissue e.g. pleura, peritoneum). Fibrosis is associated chronic industrial exposure to all forms for asbestos fibers. Usually 4 – 7 years chronic exposure is required to produce serious degree of fibrosis but the same can be hastened by smoking. Fibrosis causes persistent coughing, breathing trouble and impairs lung function;

secondary problems can be fatal. In human beings asbestos has been known to cause cancer in lungs, pleura (outer covering of lungs), peritoneum (lining of abdominal cavity) and even intestines. There is evidence to suggest that brief but intense asbestos inhalation can lead to mesothelioma after a latency period of up to 40 years. Asbestos inhalation causes lysis of red blood cells, cytotoxicity of pulmonary macrophages and stimulation of collagen synthesis.
The Asbestos Convention, 1986 adopted by International Labour Organisation (ILO) aims to control the use of asbestos.

Article 10 of the Convention states:

"Where necessary to protect the health of workers and technically practicable, national laws or regulations shall provide for more or one of the following:

(a) replacement of asbestos or of certain types of asbestos or products containing asbestos by other materials or products or the use of alternative technology, scientifically evaluated by the competent authority as harmless or less harmful, whenever this is possible;

(b) *Total or partial prohibition of the use of asbestos or of certain types of asbestos or products containing asbestos in certain work processes*."

Article 11 of the Convention states:

(1) The use of crocidolite and products containing this fiber shall be prohibited.

Although some countries are yet to ratify the convention and Russia is not a member of ILO many of the major ship-building countries have ratified the convention and use of asbestos on board ships has been / is being phased out. The new regulation in SOLAS Chapter II-1 (Construction – Structure, subdivision and stability, machinery and electrical installations) prohibits the new installation of materials which contain asbestos on all ships except for:

- Vanes used in rotary vane compressors and rotary vane vacuum pumps;
- Watertight joints and linings used for the circulation of fluids when at high temperatures (in excess of 350°C) or pressure (in excess of 7 x 106 Pa), there is a risk of fire, corrosion or toxicity; and
- Supple and flexible thermal insulation assemblies used for temperatures above 1000°C.

Moreover, since use of steam propulsion in ships is now limited mostly to LNG carriers only, requirement of asbestos based thermal insulation has also reduced. Consequently, diminishing number of ships containing large quantities of asbestos are in operation or being scrapped.

In the proposed project, all forms for asbestos inhalation will be reduced to well below the threshold limits by stringent measures described under Clause 4.2.2.1.

4.3.1.2Poly Chlorinated Biphenyls (PCBs)

PCBs are a group of synthetic organic chemicals that are added to electrical insulation, lubricating oils, hydraulic fluids etc. to increase their thermal stability and fire resistance and as plasticizers in paints, plastics, rubbers, sealing compositions etc. They are a series of technical mixtures containing many isomers and compounds that vary from thin coloured liquids to yellow or black resins to white crystalline solids. They vary in composition and degree of chlorination and perhaps even by batch. The empirical formula is $(C_{12}H_{10X})Cl_X$. They are commonly known by their trade name Aorochlor; other trade names are also in use.

Soon after commercial production of PCBs started in 1929, widespread incidence of chloracne was observed among plant workers and in some cases among their family members also. However, these were ignored till 1966, when PCB residues were found in Baltic Sea fishes. After further investigations it was decided to carefully regulate the manufacture, use and disposal of PCBs.

The acute toxicity of PCBs is relatively low. The acute oral LD_{50} to mice, rats and Mallard Ducks are approximately 2000 mg/kg, 1315 – 4000 mg/kg and 2000 mg/kg respectively. PCBs are more toxic in aquatic environment. The 96 hour Threshold Limit Value (TLV) to the freshwater fish, Bluegill, is 0278 mg/l; the 336 – 1080 hour TLV to the marine fish, Pinfish is 0.005 mg/l.

Chronic exposure leads to severe acne, edema formation, microsomal enzyme induction, porphyric action, oestrogen activity and immuno-suppression. PCBs are also strong skin irritants. Areas of skin exposed to PCBs develop pimples and dark patches which grow into pustules later. PCBs attack the liver causing acute yellow atrophy. Prolonged exposure leads to nausea, weight loss, jaundice, edema, abdominal pain and fatal liver damage. PCBs are also regarded as potent carcinogens. PCBs are known to pass through the placental barrier to affect the foetus.

The primary route of movement of PCBs through the environment is via water. PCBs accumulate in fish and aquatic invertebrates at levels more than 75000 as great in water and this leads PCB contamination in carnivorous birds and mammals. PCB levels may reach even more than 10^6 in trophic level 4. PCBs have reduced the fertility rate in Baltic Sea seals, but Killer Whales with very high PCB accumulation in their tissues are apparently unaffected. PCBs depress the immune system in some marine mammals, which then fall victim to common diseases.

PCBs may be found in a wide variety of components on ships especially older vessels. The PCB containing materials onboard ships include:

- Electrical cable insulation
- Oil based paints

- Rubber and felt gaskets
- Thermal insulation (fiberglass, felt foam, cork)
- Electrical transformers
- Capacitors
- Voltage regulators, switches, reclosers, bushings, electromagnetics)
- Engine oil and hydraulic fluids etc.

In the proposed project, PCB containing wastes expected to be generated are paint chips, engine oil, hydraulic fluids, damaged electrical cable insulation, damaged electrical components, rubber and plastics. PCB containing wastes are classified as "Hazardous" as per the provisions of the "Hazardous Wastes (Management, Handling and Trans boundary Movement) Rules, 2008".

Engine oil and hydraulic fluids will be carefully collected and sold to authorized recyclers. Salvageable electrical equipment / components, which may contain PCBs to will be sold to authorized recyclers. Tarpaulin / plastic sheets will spread below the painted platings, from where paint is to be stripped prior to cutting to collect the falling paint chips. These will then be packed and disposed off as hazardous wastes. Waste electrical cable insulation and electrical components which are unsalvageable, will also be treated as hazardous wastes and disposed off accordingly. The stringent measures described under Clause 4.2.2.2 will prevent release of PCBs into the environment from the proposed project.

4.3.1.3 E-Wastes

E-wastes are likely to contain PCBs, heavy metals (Lead, Beryllium, Copper, Cadmium, Mercury, Antimony, Hexavalent Chromium), PVCs and complex organic compounds such as Octabromodiphenyl ether (OBDE), Tetrabromo-bisphenol A (TBBPA) {Refer Table 4.1}. Many of these are toxic and once they enter the food chain can have long term toxic and teratogenic effects which may be fatal.

4.3.1.4 Paint Chips

Paint chips are likely to contain heavy metals such as lead, chromium, copper, zinc and aluminium, toxic additives to inhibit marine growth and PCBs. It may be noted that the "International Convention on the Control of Harmful Anti-fouling Systems on Ships" adopted on 5th Oct., 2001 and in force since 17th Sept., 2008 prohibits the application or reapplication of organotins compounds which act as biocides in antifouling systems or the ships "shall bear a coating that forms a barrier to such compounds leaching from the underlying non-compliant anti-fouling systems". Thus hardly any TBT containing wastes will be generated at the proposed project.

In the marine environment, most heavy metals are present in the sediments and only a small fraction is present as dissolved salts in the water. The metals are

very slowly released from the sediments to the water. Heavy metals undergo bio-accumulation and bio-magnification as they are cycled through the food chain. Plants and primary consumers may not suffer any toxic effects of heavy metal uptake. But organisms at higher tropic levels invariably suffer some adverse effects which may be lethal either in the short term or in the long term.

In the proposed project, all necessary measures will be undertaken to prevent paint chips finding their way to the environment.

4.3.1.5Radio-active Wastes

A large variety of ships, vessels, offshore oil-drilling & production platforms are recycled at Alang. These include warships which may have carried nuclear weapons or any such devices. Also certain instruments on board ordinary civilian ships may contain radio-isotopes such as smoke detectors (most ships), liquid level indicators (<5% of ships) etc.

Alang-Sosiya SRY does not process nuclear powered ships. However workers are at risk of radiation exposure on account of working on ships contaminated with radioactivity (due to having carried nuclear weapons or any such devices) or handling instruments containing radio-active isotopes.

Necessary administrative measures are in place to prevent radiological exposures to workers and the general public. These are described in Clause 4.3.2.5 below.

4.3.2 Mitigation of Impacts

4.3.2.1 Environmental Management during Asbestos& ACM Removal and Disposal

On each plot a dedicated trained Asbestos Removal Supervisor is appointed to oversee asbestos removal activities. A trained Asbestos Removal Supervisor (referred as Supervisor henceforth in this Clause) may oversee asbestos removal work in more than one plot because not all ships contain asbestos. The duties of the Supervisor include:

1. Setting up regulated areas / enclosures / containments around location of asbestos and ACM on board the ship, ensure their integrity and set up procedures to control entry and exit of workers from these areas.
2. Supervise all worker exposure monitoring.
3. Ensure that all workers handling asbestos use proper Personal Protective Equipment (PPEs). The supervisor shall also ensure that these workers use the hygiene facilities and observe the decontamination procedures.
4. Ensure through on-site inspection that engineering controls are functioning properly and workers are following the prescribed work procedures.

The Occupational Safety and Health Administration (OSHA) Standard for asbestos specifies four classes of asbestos activities {29 CFR 1915.1001(b)}. These are:

- Class I asbestos work: Activities involving removal of thermal system insulation (TSI) and sprayed-on or troweled-on or otherwise applied surfacing ACM or presumed ACM (PACM).
- Class II asbestos work: Activities involving removal of ACM which is neither TSI or surfacing ACM. This includes, but not limited to, removal of asbestos containing wall board, floor tiles and construction mastics.
- Class III asbestos work: Repair and maintenance operations where ACM, including TSI, surfacing ACM and PACM, are likely to be disturbed.
- Class IV asbestos work: Repair and maintenance operations during which workers come into contact, but do not disturb ACM or PACM, and activities to clean up dust, waste, and debris resulting from Classes I, II and III activities.

In Alang SRY, Class I (activities involving removal of thermal system [TSI] insulation and sprayed-on or trowelled-on or otherwise applied surfacing ACM or presumed ACM) , Class II (Activities involving removal of ACM which is neither TSI or surfacing ACM), Class III (Repair and maintenance operations where ACM, including TSI, surfacing ACM and PACM, are likely to be disturbed) and Class IV (activities to clean up dust, waste, and debris resulting from Classes I, II works) asbestos works are carried out.

The first step involves identification of asbestos and ACM on board the ship. A thorough inspection of the ship is carried out to note the presence of asbestos and ACM. The survey covers identification, location and quantification of Friable ACM, Category I Non-friable ACM as well as Category II Non-friable ACM.

Based on the location of asbestos and ACM on the ship, the Supervisor sets up regulated / containment areas and put up prominent and easily understood signs denoting them. Similar areas are put up on the plots as well for dismantling sub-assemblies containing asbestos (see **Photos 4.a, 4b**).

Photo 4.a: Modern Waste Handling Unit on a Plot

Photo 4.b: Asbestos Decontamination Unit on a Plot

In the smaller plots it may not be possible to have permanent asbestos handling setup. For such places, mobile units are available for deployment on the concerned plots as and when required (see **Photo 4.b**).

Photo 4.c: Mobile Asbestos Decontamination Unit

Since asbestos and ACM are classified as Hazardous Wastes as per "Hazardous Wastes (Management, Handling and Trans boundary Movement) Rules, 2008" they shall be removed before Grant of Cutting Permission by Gujarat Pollution Control Board (Refer Clause 2.5.5 in Chapter 2 of this report). Workers engaged in other activities (and hence not wearing asbestos proof PPEs) may suffer Neighbourhood Exposure.

The Supervisor regulates the entry and exit of workers to and from the asbestos containment areas. The best operating practices to control asbestos emissions are as follows:

- All asbestos and ACM have to be thoroughly wetted prior to removal. A misting unit may be used to create a highly humid atmosphere within the removal area. A highly humid atmosphere quickens the settling of airborne asbestos fibers.
- During removal, the Supervisor shall ensure that the dismantled material is carefully lowered to the ground, without dropping, throwing or sliding or damaging or disturbing the material.
- After removal the dismantled units / sections must be collected and contained in leak proof wrapping for disposal or stripped of asbestos / ACM.
- If the asbestos / ACM is stripped, the workers must:
  - Ensure that the asbestos / ACM remains wet during stripping
  - Use local exhaust ventilation and collection system to filter out asbestos particles generated during stripping
  - The system must exhibit no visible emissions to the outside air.
- The regulated areas, where asbestos handling is done must meet the following requirements:
  - The regulated areas must be marked in a manner that limits the number of workers in the area and workers outside the area are not exposed to airborne asbestos.
  - Only authorized personnel are allowed to enter the area.
  - All personnel entering the area must wear approved respirators and be medically fit to do so.
  - Eating, smoking, drinking or chewing paan / tobacco / gum are strictly forbidden within the regulated area.
  - Workers engaged in asbestos removal shall wear special protective clothing including face masks and respirators and gloves (see **Photo 4.d**), which they shall don and discard in special enclosures equipped with decontamination facilities. The details are discussed in Clause 4.8.2.

Photo 4.d: Workers Engaged in Asbestos Removal

- The asbestos handling enclosure has to be cleaned with Vacuum cleaners equipped with High Efficiency Particulate Air (HEPA) filters.
- In addition, to achieve compliance with permissible exposure limits, the facility must use control methods including, but not limited to:
  - Local exhaust ventilation equipped with HEPA filter dust collection systems
  - Ventilation of the regulated area to move contaminated air away from the breathing zone of workers and towards a filtration system provided with HEPA filter.
- To ensure that airborne asbestos does not migrate from the regulated area, attempts are made to use critical barriers, wherein one or more layers of plastic are used to seal all openings into a work area to prevent migration of airborne asbestos.

❖ Sub-assemblies containing asbestos / ACM are dismantled in a negative pressure enclosure on the plot. The enclosure is kept at negative pressure through a ventilation room, whose outlet has heavy duty HEPA filters. The negative pressure ensures that no asbestos comes out. Nevertheless there are arrangements for water sprinkling inside the enclosure. Additionally, workers engaged in dismantling asbestos / ACM inside this enclosure wear special protective clothing and go through a three stage entry / exit process described under Clause 4.8.2.

❖ After wetting, all asbestos containing waste material (ACWM) is sealed in leak proof containers while still wet. For bulk wastes, that do not fit into containers without further recycling, the plot puts these wastes into leak proof wrapping, which are sealed with duct tape while still wet. If it is decided to place bulk ACWM in trailers or roll-off boxes, the trailers / boxes are lined with plastic sheeting prior to loading. To minimize the logistics / problems of handling ACWM, efforts are made to package as much as possible of the ACWM on board the ship itself in the regulated enclosure.

Photo 4.e: Asbestos & ACM stored Prior to Final Disposal

- The following work practices / engineering controls are not be used for asbestos removal work as the disturb ACM:
  - Use of high speed abrasive disc saws that are not equipped with point of cut ventilator or enclosures with HEPA filtered exhaust air.
  - Use of compressed air for asbestos / ACM removal, unless the compressed air is used in conjunction with an enclosed ventilation designed to capture the dust cloud created by the compressed air.
  - Dry sweeping, shoveling or other dry cleanup of dust and debris containing asbestos / ACM
  - Employee rotation as a means of reducing individual asbestos exposure.

The packaged ACWM is transported by dedicated marked tractor-trolleys to Alang TSDF (see **Photo 4.f)**.

At Alang TSDF, the ACWM is dumped in a separate masonry pit in landfill for hazardous wastes (see **Photo 4.g)**. Layer of ACWM is further cemented over to ensure 100% immobilization (see **Photo 4.h).**

Photo 4.f: Dedicated Tractor Trolley for Transportation of Hazardous Wastes from Plots to Alang TSDF

Photo 4.g: Location of ACWM Disposal Pit

Photo 4.h: ACWM being Cemented Over

4.3.2.2 PCBs

Wastes containing 50 mg/kg or more of PCBs are classified as "Hazardous Wastes" vide Schedule II of Hazardous Wastes (Management, Handling and Trans-boundary Movement), Rules, 2008 {Sl. No. A16 of the Schedule}.

The list of PCB containing wastes has been listed earlier under Clause 4.2.1.2.

Insulation from damaged electrical cables will be stripped in a designated area which will be marked accordingly. Similarly damaged electrical equipment, which may include PCB containing components will be dismantled in the designated area.

All wastes, which may contain PCBs (e.g. damaged electrical cable insulation, capacitors etc.) will be segregated and stored separately in labeled packages as specified in Rule 19 of the Hazardous Wastes (Management, Handling and Trans-boundary Movement), Rules, 2008.

The plot owners maintain records of generation and disposal of PCB wastes as specified in Rules 21 and 22 of the said Hazardous Wastes (Management, Handling and Trans-boundary Movement), Rules, 2008. The wastes are transported to Alang TSDF for hazardous wastes and disposed off as specified in Rules 20, 21 and 18 of the said rules, respectively.

4.3.2.3 Paint Chips

Paint chips are likely to contain lead, chromium, zinc, copper and other heavy metals. Heavy duty canvas sheets may be spread below the surfaces which are to be stripped of paint prior to cutting to collect the falling paint chips. Decks where paint chips have fallen are cleaned and the debris picked up using vacuum cleaners. The paint chips are placed in leak proof labeled containers and stored in a designated place prior to being dispatched to Alang TSDF.

4.3.2.4 E- Wastes

Because of these the wastes attract the provisions of Hazardous Wastes (Management, Handling and Trans-boundary Movement), Rules, 2008 and E-Waste (Management and Handling) Rules, 2011.
As stipulated under Rule 7 of E-Waste (Management and Handling) Rules, 2011, the individual plots:

1. Obtain authorization and registration from GPCB in accordance with the procedures under Rules 9 and 11 of the said Rules.
2. The dismantled material is properly stored and transported.
3. Workers engaged in dismantling and handling e-waste are issued proper personal protective equipment (gloves, dust masks etc.)
4. The recoverable items are sold only to authorized recyclers.
5. Ensure that the non-recyclable / non-recoverable components are sent to an authorized TSDF {in this case Alang TSDF}.
6. File a return in Form 3 to GPCB on or before 30th June following the financial year to which the return relates.

As stipulated under Rule 12 of E-Waste (Management and Handling) Rules, 2011, the individual plots:

1. Maintain a record of generation of e-wastes, their storage and segregation, storage and disposal (sale to authorized recycler and handing over to Alang TSDF). These records should be made available for inspection by concerned authorities.

2. Ensure that the e-wastes generated at the facility are not stored for more than one hundred and eighty days.

4.3.2.5 Radioactive Wastes

To prevent radiological exposure to workers and the general population the following precautions are taken at Alang-Sosiya SRY:

- On entering Indian Maritime Zone, ships bound for recycling have to inform Maritime Rescue Co-ordination Centre and Indian Coast Guard.
- Ship requests permission from Port Authorities, GMB and Customs for anchoring. Ship physically inspected by Gujarat Pollution Control Board (GPCB), Petroleum & Explosives Safety Organization (PESO), Customs, Directorate of Industrial Safety & Health. In case of all warships, the inspection team also includes a representative of Indian Navy and Atomic Energy Regulation Board (AERB). In case of all civilian ships, the inspection team also includes a Radiological Safety Officer (RSO). The RSO is an AERB trained and Certified Safety Officer, who is a part of GMB's Safety Deptt. At Alang. Anchoring permission granted only after clearance from all agencies.
- Ship's captain has to submit standard declaration form to AERB prior to beaching stating information on radio-active material present in ship.
- Based on pre-beaching scrutiny of documents of the ship, the RSO lists the radio-active instruments / devices on board. The RSO may also carryout inspections on his own. The radio-active materials have to be removed as part of the "Decontamination" process which is mandatory for receipt of cutting permission.
- The removed radioactive materials will be handled as per AERB guidelines and handed over to AERB Certified waste management organisation.

4.3.2.6 Other Solid Wastes

Other solid wastes which are generated are remnants of cargo, packaging material (wood, cardboard, paper), insulating material [Polyurethane foam rubber, Expanded Polystyrene (thermocol), plastics etc.], metal chips, contaminated soil etc.

During gas cutting of ships' hulls, globs of molten steel are generated which are likely to fall on the beach. Asbestos sheets, which may have been recovered from ships, may be placed on the ground below the cutting line to collect the falling globs of molten metal. This will improve material recovery and reduce contamination of the beach. The collected metal may be sold off as melting scrap.

All non-hazardous non-metallic materials are collected and stacked separately till they can be dispatched to Alang TSDF.

In spite of best efforts, the sand of the beach may be contaminated by spillages of oil / oily sludge, paint debris etc. In such cases, the contaminated sand will be scraped off and dispatched to Alang TSDF.

4.4 ALANG WASTE TREATMENT, STORAGE & DISPOSAL FACILITY (TSDF)

GMB has developed a dedicated TSDF for disposal of wastes generated from Alang-Sosiya SRY. The TSDF is located within Alang Notified Area near Manar Village alongside SH-37. The TSDF includes an Effluent Treatment Plant (ETP), an Incinerator and Landfills for hazardous wastes as well as municipal solid wastes (MSW). The TSDF has its own fleet of tractor-trolleys for transporting wastes from the ship-recycling plots to the TSDF site, weigh-bridge and quality control laboratory. GMB has contracted M/s Gujarat Enviro Protection and Infrastructure Limited (GEPIL) to operate the TSDF.

4.4.1 Incinerator

The TSDF has an incinerator with capacity to incinerate 5 t/day of wastes. The incinerator is used to dispose of solid, semi-solid and liquid wastes whose calorific value exceeds 2500 Kcal / kg and whose Loss on ignition (LOI) is more than 20%.

The incinerator handles:

- Oily sludge
- Oily rags / cloth and sand
- Paint & coatings
- Poly-urethane foam (PUF) and Polystyrene (including thermocol)
- Rubber gaskets & isolation mountings.
- Insulation of damaged electrical cables.
- Plastics, paper etc.

The incinerator is a dual chamber type. It uses LDO as a startup fuel. The incinerator is housed in a separate building with its own automatic fire detection and water sprinkling system. The LDO is however stored in 20 kl over-ground tank outside the incinerator building.

Photo 4.i: Existing Incinerator at Alang TSDF

The incinerator comprises of:

- Incineration Unit
- Burner system
- Liquid waste injection system
- Venturi scrubber
- Packed bed scrubber
- High Efficiency Particulate Air (HEPA) filter
- Chimney

Incineration Unit: The Incinerator Unit comprises of static Primary Chamber and a Secondary Chamber.

The Primary Chamber comprises of a steel shell with an inner refractory lining designed for temperatures up to 1200^{o}C, though usually the temperature is maintained at ~850^{o}C. The Primary Chamber is initially heated by firing LDO. Solid wastes are charged manually into the Primary Chamber at one end and ash is removed manually from the other end. The ash is cooled and sent to the TSDF's landfill. The Primary Chamber is equipped with safety arrangements such as pressure and temperature indicators and inspection window.

Flue gases from the Primary Chamber are completely burnt in the Secondary Chamber. The Secondary Chamber too is a steel shell with an inner refractory lining designed for temperatures up to 1400^{o}C, though usually the temperature is maintained at ~1100^{o}C. The Secondary Chamber is heated by firing high calorific value liquid waste or additional auxiliary fuel (LDO). The Secondary

Chamber and ducting are designed so that the minimum residence time of the gases from the Primary Chamber is 2 seconds to ensure complete combustion.

Burner System: The burner system is a step-less oil fired system designed with the consideration that pre-heating shall be for 8 hours. The temperature of the primary combustion chamber is initially raised and maintained at ~850^{o}C by firing LDO. The primary burner is of the capacity ~0.8 x 10^{6} Kcal/hr. The secondary burner's capacity is ~0.55 x 10^{6} Kcal/hr. The burner is operated only during pre-heating and whenever the temperature falls below 750 - 800^{o}C.

Venturi Scrubber: The waste flue gases leaving the secondary combustion chamber are cooled and cleaned in a Venturi Scrubber. The cooling prevents the formation of dioxins and furans. Scrubbing is carried out by water. The Scrubber Liquor is stored in Scrubber tank which has internal baffles. Sludge accumulates in this tank and is removed periodically. Makeup water is also added to the system at the Scrubber Tank.

Packed Bed Scrubber: The scrubbed gases from the venture scrubber are further scrubbed in a Packed Bed Scrubber with fresh water to remove the residual gases. The Packed Bed Scrubber is filled with PP pall rings which give additional contact area for scrubbing. The Scrubber's inner lining is corrosion resistant. A 25 kl underground tank has been provided for storage & recirculation of scrubber liquor. The pH of the Scrubber Liquor is adjusted to neutral in this tank.

ID Fan: The total system is kept under negative pressure by the ID Fan.

HEPA Filter: The scrubbed gases are routed through a High Efficiency Particulate Air (HEPA) air filter to remove the very fine particulates before being discharged through a 32.5 m high chimney of 500 mm internal diameter.

The Process Flow of the incinerator is illustrated in **Fig. 4.1**

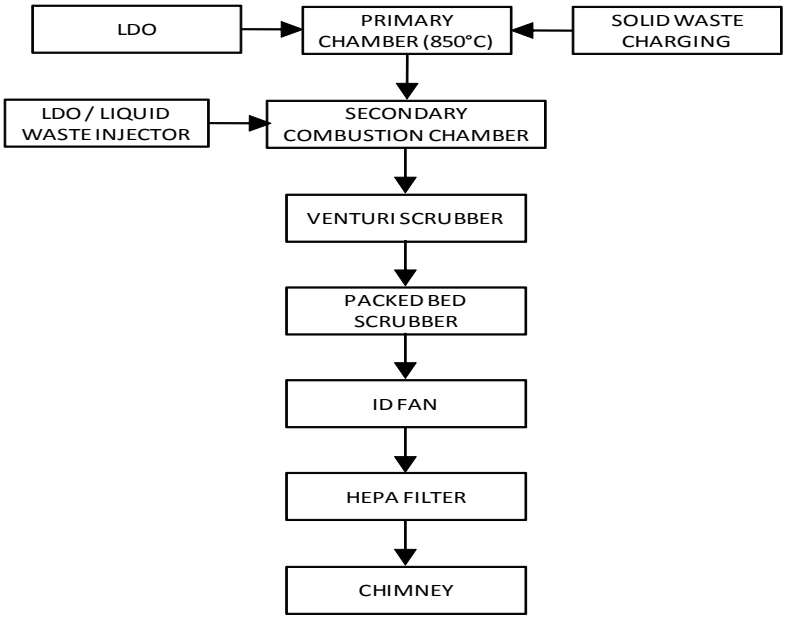


Fig. 4.1: Process Flow Diagram of Incinerator

It is proposed to set up another incinerator of capacity 25 t/day adjacent to the existing incinerator building to handle additional wastes from the expanded yard. The new incinerator will be similar design.

4.4.2 Effluent Treatment Plant (ETP)

The ETP has a capacity to treat 30 m^3/day of oily waste waters from ships by physic-chemical and biological means. The ETP also treats leachates from the TSDF's landfills and waste water generated from the incinerator's flue gas scrubbing system.

Oily water is collected from the ships and transported by tankers or in drums to the ETP. Leachates from the landfills are pumped to the ETP site. The sequence of treatment is as follows:

1. The effluent is collected in a collection tank.
2. From the collection tank, the effluent flows to an oil & grease removal unit, where oil & grease floats to the top and skimmed off. Along with oil & grease, coarse solids including sticks, rags etc. are also removed by settling / floatation.
3. From the oil removal unit, the effluent flows to the Equalization Tank, where scrubber liquor from the TSDF's incinerator and leachates form the TSDF's landfills are also added. The pH of the effluent is adjusted to 7.5 – 8.5.
4. From the Equalization Tank, the effluent is pumped to the Flash Mixer, where coagulants are added. The effluent is homogenized by mechanically agitation.

5. The homogenized effluent flows by gravity to the flocculator / reaction channel.
6. From the reaction channel the effluent flows by gravity to the Primary Settling Tank. The underflow of the Primary settling tank is sent to sludge drying beds; dried sludge is dumped in the TSDF's landfill.
7. The overflow of the Primary Settling Tank flows by gravity the Aeration Tank. Di-ammonium phosphate and urea are added to the Aeration tank to promote the growth of micro-organisms.
8. Treated water from the Aeration Tank flows by gravity to the Secondary Settling Tank. Part of the sludge from the Secondary Settling tank is recycled back to the Aeration Tank. The rest of the sludge is pumped to sludge drying beds.
9. Treated water is stored in storage tank. Part of the water from the storage tank is used for meeting industrial water requirements of the project. The rest is discharged after necessary quality checks.

The process flow diagram of the ETP is shown in **Fig. 4.2.**

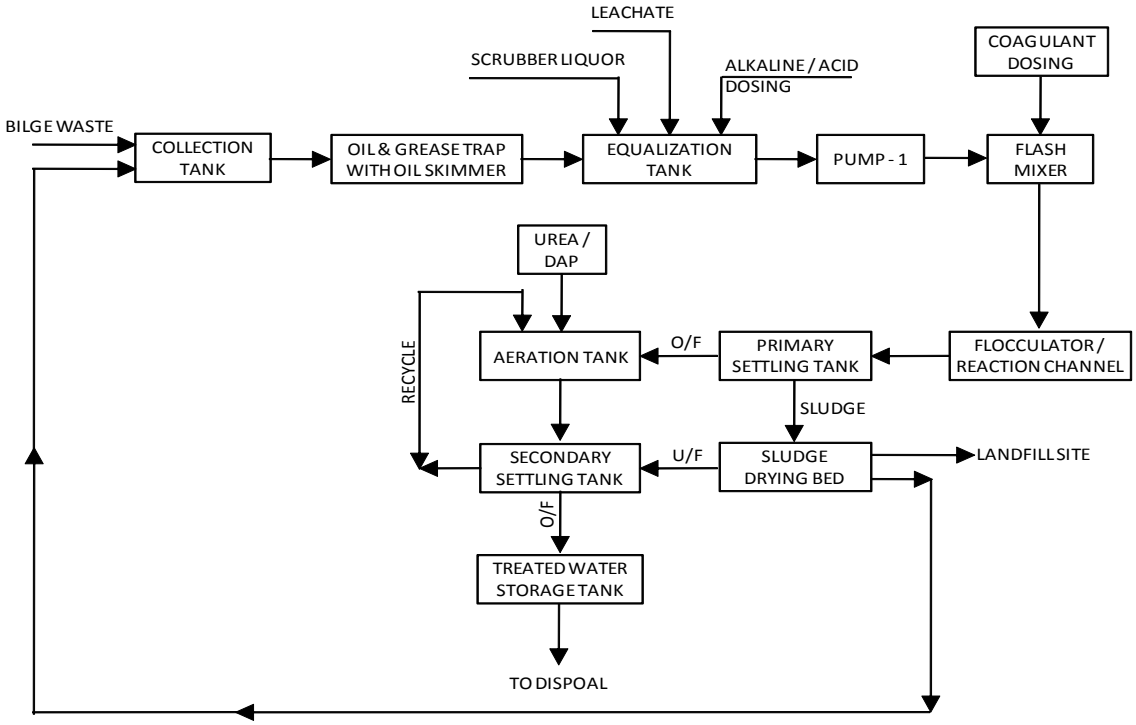


Fig. 4.2: Process Flow Diagram of ETP

It is proposed to construct another ETP of similar design and capacity within the existing TSDF to cater to the requirements of the expanded yard.

The water balance of the Incinerator and ETP are shown as **Fig. 4.3**.

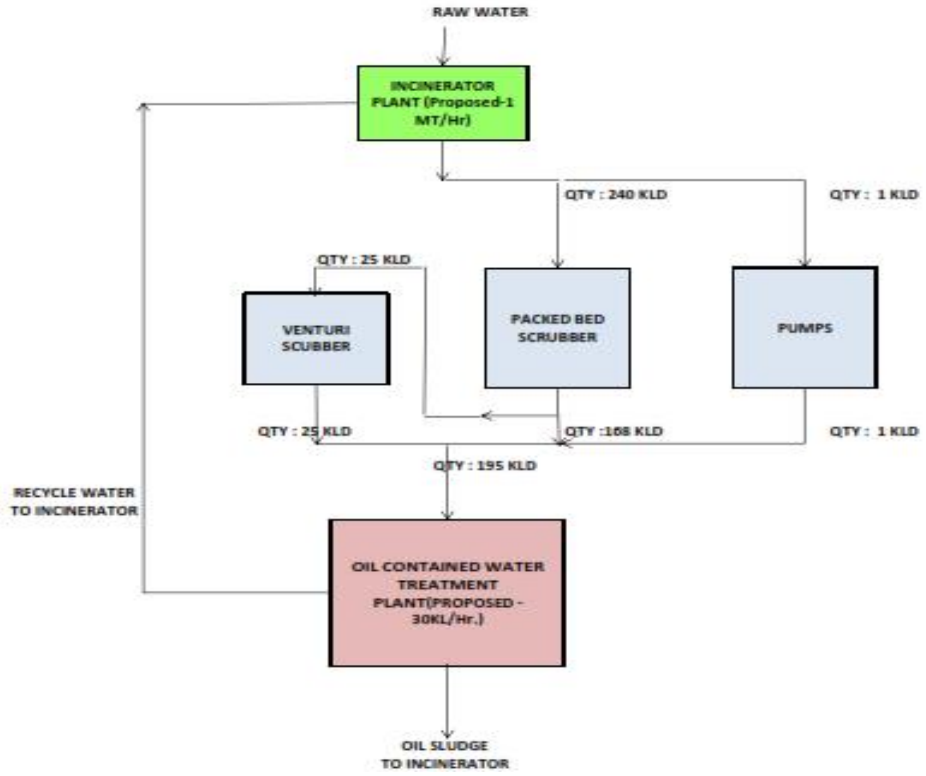


Fig. 4.3: Water Balance for TSDF

4.4.3 Landfills

Two land-fill cells have been developed within Alang TSDF, one for hazardous wastes and the other for municipal solid wastes (MSW). The hazardous waste landfill cell has a volume of 70,000 m^3, whereas the MSW land fill cell has a volume of 30,000 m^3. Solid wastes, whose calorific value is less than 2500 Kcal / kg and whose Loss on ignition (LOI) is less than 20% are dumped in the landfills. These include asbestos & ACM, glass-wool, rusted iron scales, cement tiles, incinerator ash, garbage etc.

Photo 4.j: Operational Hazardous waste Disposal Land-fill

Photo 4.k: Newly Built MSW Landfill

Both the landfills have a bottom liner as well as side liner.

For the MSW landfill the Bottom Liner is a single layer system comprising of:

1. 300 mm thick drainage layer of permeability 1 x 10^{-2} cm/second.
2. 1.5 mm thick HDPE liner
3. 900 mm thick compacted clay / amended soil of permeability 1 x 10^{-7} cm/second.

For the hazardous waste landfill the Bottom Liner comprises of:

1. 2 nos. 300 mm thick drainage layer of permeability 1 x 10^{-2} cm/second.
2. 2 layers of 1.5 mm thick HDPE liner
3. 2 layers of 450 mm thick compacted clay / amended soil of permeability 1 x 10^{-7} cm/second.

The cross section of the bottom liner of hazardous waste landfill is shown in **Fig. 4.4**.

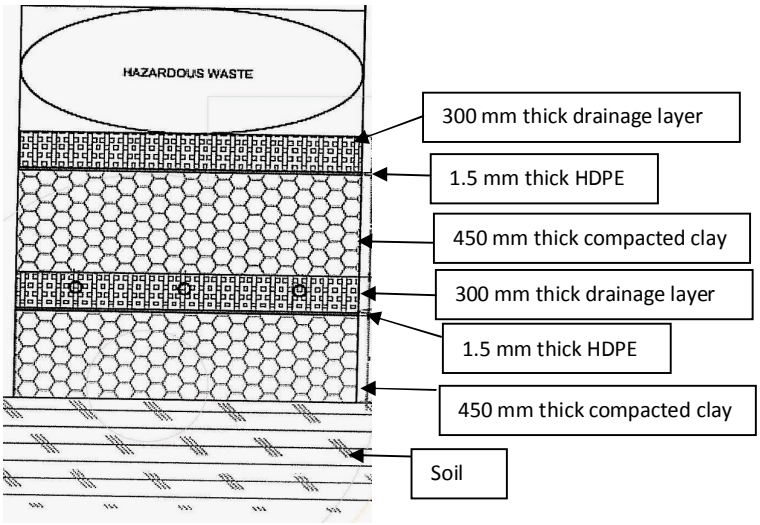


Fig. 4.4: Section of Bottom Liner of Hazardous Waste Landfill

The side liner comprises of 300 mm thick compacted clay and 1.5 mm thick HDPE.

The bottom liner also has 150 mm diameter perforated pipes for collection of leachates. The pipes are sloped towards a collection well where the leachates collect and are pumped to the ETP.

At the end of the landfill's life the wastes will be covered with a layer of HDPE followed by a thick layer of soil. Grasses and shrubs will be planted on the soil.

Photo 4.l: Old Landfill Cells

4.4.4 Odour Management

Municipal and hazardous waste management facilities can generate a complex range of process odours under specific conditions.

Odours from waste transportation can vary greatly depending on the type of waste and the method of transport. These odours are normally transient in nature and rarely the source of ongoing odour impacts. Typical odour causing compounds from waste transportation include volatile organic acids and methyl mercaptan. These are often associated with decomposing putrescible wastes and can be best mitigated by proper transport and containment and by slowing the rate of decomposition.

The primary objective of storage is to temporarily store the waste before sending it to landfill or incinerator depending upon their characteristics. Some biological activity will occur in these storages, and the gases generated can be a source of odours. The potential for waste odours to be carried away by air movement will increase if the waste is left uncovered. It is important that putrescible waste be kept relatively cool in an enclosed container and be removed and disposed quickly. It is also important that the container be adequately cleaned after that waste is removed so that putrescible residues do not remain to decompose further and generate odour.

Incineration Facility

The most common odour causing compounds from incinerators are volatile organic acids and methyl mercaptan. These compounds are detectable at very low concentrations. The waste combustion process itself is not generally prone to frequent odour problems.

Landfill Areas

The most common odour-causing compounds at landfills are hydrogen sulphide, sulphur dioxide, ammonia, and methyl mercaptan. These are produced during decomposition of wastes. In addition, methane can also be generated.

Other landfill odour problems are normally related to transportation, handling and storage issues. These problems can be addressed by control of transportation; appropriate waste storage and containment; minimization of the area and time that the active portion of the landfill remains exposed to the environment; and generally careful operation and maintenance of the landfill facility.

Odour Control Measures

Storage Facility

The TSDF receives and stores waste in an enclosed area with a negative pressure with the airflow being routed through the incinerator which prevents unpleasant odours from escaping into the atmosphere. While handling smelly wastes, care shall be taken to avoid smell nuisance.

Incineration

Incineration is the oxidation of the odour into carbon dioxide and water by the combustion of the odour with fuel and air. The reaction takes place at temperatures ranging from 750^{o} C to 850^{o} C. This is generally above the auto-ignition temperature of most solvents and other VOCs and is a reflection of the heat required to maintain the reaction at dilute concentrations with additional process heat losses. In this regime, the destruction efficiency is almost 100%, assuming adequate oxygen supply. In some cases, other compounds may be formed depending on the mixture of fuel and air used the flame temperature and the composition of the odour. These compounds may include carbon monoxide, oxides of nitrogen and sulphur oxides.

In this case the incinerator building has been designed to draw air from the waste receiving and storage areas to be used to provide oxygen to the combustion process. This creates a negative air pressure in the waste handling areas and prevents the escape of odour causing pollutants to outside areas. The combustion gases are scrubbed with water which removes smelly gases. The scrub liquor is treated in the TSDF's ETP.

4.5 WATER ENVIRONMENT

4.5.1 Anticipated Impacts

The effluents which are generated from the project are:

1. Ballast water (even several thousand t / ship, depending on its size).

2. Bilge water (maximum ~200 m^3/ship)
3. Slops generated during washing of cargo tanks and pipelines of oil tankers
4. Oily water generated due to washing of fuel tanks prior to cutting.
5. Sewage from the facility's offices, rest rooms and canteens

Impacts of Ballast Water Discharge

Empty cargo ships pump water into empty tanks to increase draft so that their propellers and rudders are effective. When taking on cargo, this water ballast is simply pumped overboard. When the ballast water is pumped overboard, the marine organisms which were present in the waters of the port of origin of the ballast water are released into the waters of the port of discharge. These marine organisms can be invasive species in the waters of the port of discharge, with disastrous effects on the local ecology.

In order to prevent the spread of invasive species, the "International Convention for the Control and Management of Ships' Ballast Water and Sediments" (BWM Convention) was adopted by International Maritime Organisation (IMO) on 13th Feb., 2004. The convention requires all ships to implement a Ballast Water and Sediments Management Plan. IMO has formulated a protocol which requires ships to change their ballast water in high seas with an efficiency of 95% volumetric exchange while transiting between ports. A system for recording the ballast water exchange has also been devised and all ships are required to maintain the same for scrutiny (Refer **Annexure 4.2**). Although the Convention is not yet in force as 36 countries representing 29.07% of the world shipping tonnage have ratified the same (35% required; India yet to ratify), many concerned port authorities scrutinize the records of ballast water exchange prior to discharge of ballast water in their respective ports.

In some rare cases ballast water may be contaminated with oil (i.e. the ballast water is "Dirty"). Discharge of oily water from ships can cause water and sediment pollution. Large concentrations of oil can lead to mortality of marine organisms. Lower concentrations, though not immediately lethal, can have long term lethal consequences due to bio-accumulation and bio-magnification.

Regulation 9 of Annex I of MARPOL 73 / 78 prohibits the discharge of oily effluent whose oil content does not exceed 15 parts per million (ppm) without dilution. Regulation 16 of Annex I of MARPOL 73 / 78 also stipulates that all ships of more than 400 t Gross Tonnage, must have Oil Filtering systems on board.

At the project necessary administrative measures will be taken to prevent the discharge of un-exchanged ballast water and oily ballast water.

Impacts of Bilge Water Discharge

The space between the floor plates of a ship's engine room and the moulded bottom is called the bilge space. Water accumulating in the bilge space is called bilge water. The bilge water consists of stagnant dirty water and other liquids such as condensed steam,

leakages from the engines' fuel, oil, coolant and water pipelines, water seeping into the engine room through the propeller shaft glands etc. During ship scrapping, bilge water may also be generated due to accumulation of rain water (as the decks are open) and collection of water from fire lines that leak, are left open or are used to wet down compartments, water spraying during asbestos removal and metal cutting.

Bilge water may contain up very high concentrations (even >15000 mg/l) of oil. If untreated bilge water is discharged into the sea, oil slicks are formed which may be carried long distances. The oil can have short term or long term toxic effects on marine organisms, which may be fatal. If biocides are present are present in the bilge water, the problem will be intensified.

Regulation 9 of Annex I of MARPOL 73 / 78 (refer above) prohibits the discharge of oily effluents containing more than 15 ppm of oil. The above provisions do not apply to the discharge of processed bilge water from machinery spaces provided that all of the following conditions are satisfied:

(a) The bilge water does not originate from cargo pump-room bilges;
(b) The bilge water is not mixed with oil cargo residues;
(c) The ship is proceeding *en route;*
(d) The oil content of the effluent without dilution does not exceed 15ppm;
(e) The ship has in operation oil filtering equipment complying with the Convention (Regulation 16 [51); and
(e) The filtering system is equipped with a stopping device which will ensure that the discharge is automatically stopped when the oil content of the effluent exceeds 15ppm.

Presently an average of 5.26 m^3 or 0.005844 m^3/LDT of bilge water is generated per ship. Presently hardly any tankers are recycled at Alang. With the modernization of Alang SRY a number of tankers are expected to be sent to Alang. Tankers contain much more bilge water. It is expected that annual bilge water generation at the SRY will be ~15700 m^3.

At the proposed project, all necessary measures will be undertaken to prevent the discharge of untreated bilge water.

Impacts of Slops and Other Oil Water Discharges

Oil tankers and bulk liquid cargo carriers periodically need to wash their cargo tanks. Obviously the wash waters contain large concentrations of oil (in case of oil tankers) and other chemicals. This water is called slop water or simply "slops". International regulations forbid the discharge of untreated slops into the sea. If the slops cannot be discharged to shore based treatment plants, they are stored onboard in dedicated tanks called Residual Oil Tanks (ROTs) or slop tank(s) till they can be discharged to shore based treatment plants. Ships also need to periodically wash their fuel tanks and pipelines. The wash waters contain high concentrations of oil & grease and since their direct discharge will

lead to oil pollution, they are either routed to treatment plants (either on board or shore based) or pumped to the slop tanks.

At the project, ships' fuel tanks, ballast tanks, bilge spaces and tankers' cargo tanks, slop tanks and pipelines will be cleaned prior to cutting in the Decontamination Facilities (i.e. dry-docks). Necessary measures are undertaken to prevent oil pollution on account of discharge of oil laden waters.

4.5.1 Mitigation measures

Ballast Water Management

In the project, to prevent the introduction of invasive marine organisms into Indian coastal waters, the Ballast Water Handling Logs / Exchange Reporting Forms are scrutinized prior to grant of beaching permission. Beaching permission is granted after ensuring that ballast water has been completely exchanged in high seas outside Indian waters.

Regulation 9 of Annex I of MARPOL 73 / 78 prohibits the discharge of oily effluent containing >15 ppm oil without dilution. Therefore all ballast water is checked for oil content prior to taking a decision on grant of beaching permission.

If a ship is found to be containing dirty ballast, the ballast has to be cleaned on board prior to grant of beaching permission.

Sediments / sludge of ballast water tanks may contain eggs / larval forms / dormant forms of invasive organisms. Therefore ballast water tanks are thoroughly cleaned and the sediments / sludge will be disposed off to Alang TSDF.

Bilge Water Management

The bilge water is filtered in the onboard systems prior to beaching. In case, the onboard oil filtration systems are not able to reduce the oil content to <15 ppm, the concerned authorities will make a note of the same and issue orders that the bilge water should not be pumped out without prior permission. At present all bilge water present on board, regardless of oil content, is pumped out into tankers, which transport the same to Alang TSDF's ETP. The recovered oil is incinerated. The same procedure shall be followed in future also.

Slop Water Management

Slop water is generated on board tankers (carrying crude, refined products and chemicals) on account of washing of cargo tanks. Obviously the water is expected to contain oil or the last cargo carried. The water are cleaned using onboard systems prior to beaching. In case onboard oil filtration systems are unable to handle the slops, the ships will be dry-docked prior to beaching for offloading the slops to Alang TSDF's ETP. However in case the contents of the slops are such that Alang TSDF's ETP will not be able to treat them, the ships will advised to offload their slops at a suitable port prior to coming to Alang.

Fuel Tank Wash Water Management

Oily waste water and oily sludge are generated on account of cleaning of ships' fuel tanks, oil sumps and pipelines prior to cutting.
Nowadays most ships have compression ignition engines. Only LNG carriers and warships have steam turbine or gas turbine engines. Most ships' use two kinds of fuels; furnace oil (= Bunker C Oil, Heavy Fuel Oil, Residual Fuel Oil No. 6 etc.) or diesel. Diesel fuel is used only within territorial waters of certain countries where air emission regulations are stringent (e.g. in USA) and consequently only small amounts may be stored aboard ships. Mostly furnace oil (F.O.) is used.

As per Schedule II of Hazardous Wastes (Management, Handling and Trans-boundary Movement), Rules, 2008 Flammable Wastes are those wastes with Flash Point 65.6°C or below. The flash point of F.O. is 66° C and that of diesel >120° C. Thus the contents of the fuel tanks cannot be classified as "Hazardous" and do not attract the provisions of the said rules. After beaching the residual unused fuel on board the ships is pumped out and sold to registered ships' fuel suppliers.

The sludge is removed by scraping, wiping with absorbent material such as rags and saw dust etc. and the same are sent Alang TSDF for incineration.

The wash water generated on account of washing the fuel tanks / oil sumps are likely to contain large concentrations of oil. These effluents are taken by tankers to Alang TSDF.

Sewage

About 3000 m^3/day of sewage is expected to be generated from the proposed labour barracks. This sewage will be treated in a sewage treatment plant. The treated sewage will be used to meet the industrial water requirements of the project. Unutilized treated sewage may be discharged on to agricultural land or barren land.

About 200 m^3/day of sewage is generated at the plots. This sewage is disposed off through septic tanks and soak pits.

At Alang, seven public toilet blocks have been set up for use by other workers and visitors. Two more such toilet blocks will be set up. About 60 m^3/day of sewage generated from each of these toilet blocks is disposed off through septic tanks and soak pits. In future, effluents from the caretaker rooms and bathing areas of these public toilet blocks shall be channelized to sumps. Clarified water from the sumps will be used for dust suppression and / or green belt irrigation.

There are several public eateries in Alang Notified Area. About 80 m^3/day of effluents generated from these eateries is discharged onto land or public sewers.

There are several workshops in Alang Notified Area for repair & maintenance of trucks, cranes and other mechanical equipment. It will be made mandatory for

these work-shops to have a cemented platform for washing of vehicles. These platforms will be sloped towards a garland drain to collect the wash water. The garland drains will be routed through settling pits provided with oil & grease traps. The clarified water will be collected in sumps. From the sumps the water will be used for dust suppression or watering road-side trees.

Drainage arrangement

As mentioned earlier (in Chapter 2, Clause2.6.2), the proposed up gradation project envisages construction of:

- Impermeable concrete pavement of 45 m (L) x 90 m (W) or 45 m (L) x 60m (W)
- Embankment of Sheet piles on the sea side of the concrete pavement (90m long and 60m long)
- Drain ditch at the edge of the concrete pavement, alongside the sheet piles to capture oil or oily water. The ditch will be 1.2 m wide, 1.2 m deep and provided with oil skimmer(s). The ditch will be covered with heavy duty removable gratings.
- Oil- skimmer of 1.1m (w) x 2.7m(L) x 1.15m (D) to avoid oil escape during a heavy rain like that of monsoon. Material Design for the Recycling Yard

The storm water shall drain into a drain at the edge of the concrete pavement. This drain shall be routed to a settling pit with an oil and grease trap. This settling pit shall remove solid debris and oil from the storm water.

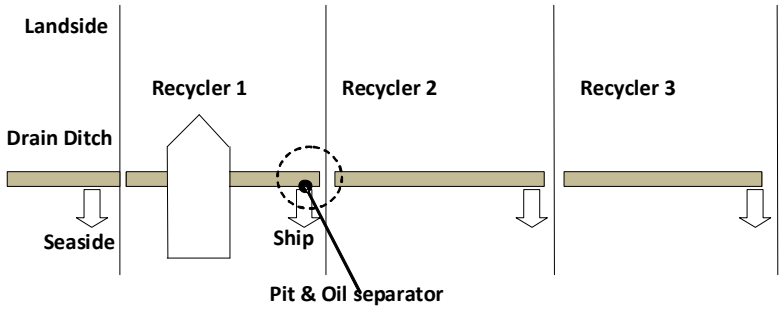


Fig. 4.5: Location of Pit & Oil Separator

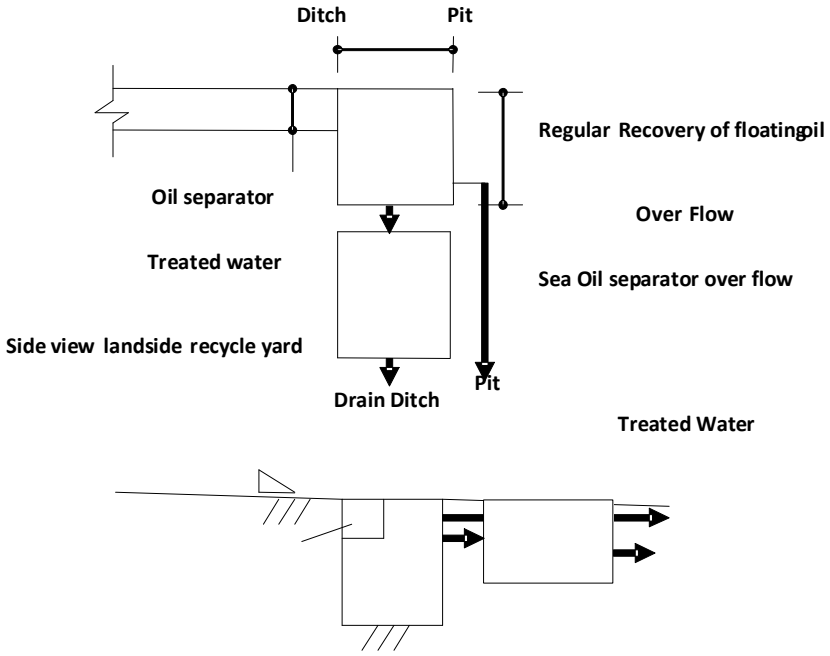


Fig.4.6: Pit & Oil separator Detail (Top View)

4.6 AIR ENVIRONMENT

4.6.1 Anticipated Impacts

At the expanded ship recycling yard, LPG will be used for cutting of ships @ 22000 t/yr. Othe r than CO_2, NOx will be generated. The annual NOx generation has been estimated to be 87230kg /yr (@ 86 g NOx/GJ) i.e. 290.77 kg/day. This will be generated at over a wide area (~12000 m x ~250 m). The adiabatic flame temperature of LPG is>1500^{o}C. Because of the high temperature of generation, the NOx, will disperse rapidly in the atmosphere. In addition the high prevailing wind speeds will further promote dispersion of the NOx. At the expanded project HSD will be used as fuel for material handling equipment and for material transport. The emissions from vehicles will contain NOx. The NOx will be dispersed by the high prevailing wind speed. The high rate of dispersion will ensure that the NOx is rapidly diluted in the atmosphere. Nevertheless the dispersion of NOx generated on account of the proposed expansion of the SRY has been mathematically estimated by AERMOD model. This is a mathematical

Gaussian Plume Dispersion Model which has been approved by USEPA and also recommended by MoEF&CC for prediction of ground level concentrations (GLCs) of pollutants.

While estimating the dispersion of NOx from the proposed expansion project, three types of sources are considered – Point source as stack emission from incinerator, line source as road emissions and area source as fugitive emissions from work site. The entire project area has been considered to be an area source. The project area is considered as consisting of 15 plots each of dimensions 100m X 145m and the emissions are uniform area source emissions. Emission rate per unit area is calculated using the total fuel quantity used per day and is found to be 0.000009 g/sec/m^2. An average release height of 1 m is considered for each plot.

In case of vehicular emissions, the road leading to project site is metalled and the possibility of generation of pollutants other than NOx is insignificant. Due to increase in production of ship yard it is estimated that there will be an increase of about 164 trucks per day. As per the report on Emission Factor development for Indian Vehicles by CPCB, there will NOx generation of about 9.3 g/Km per truck.

Total length of path was considered as 13.75 Km with an average width of 5 m. Based on the emission factor as indicated above overall NOx emission due to plying of additional trucks in the study area is calculated as 1.1 X 10^{-5}g/sec/m^2. Thus the total NOx emissions from trucks is estimated to be 21.78 kg/day.

As mentioned earlier, there is a proposal to set up a new incinerator to handle additional wastes from the expanded SRY. This new incinerator will be of similar design as that of existing incinerator and will come up adjacent to the existing incinerator building.

The anticipated emissions from the proposed incinerator have been computed based on the present performance of the existing actual stack monitoring results. For estimating SO_2 and NOx emission rate from the proposed incinerator, max values of emissions as per the audit report (July-Dec, 2014) have been taken.

Table 4.3 shows emissions that have been considered for the proposed incinerator.

Table 4.3: Emissions from Proposed Incinerator

Height (m)	Dia (m)	Temp (K)	Discharge Nm^3/h	Exit velocity (m/s)	Anticipated Emissions (g/sec)		
					PM_{10}	SO_2	NOx
32	1	301	34000	13.26	0.47	0.71	1.32

Hourly meteorological data, as monitored during Summer season, 2015 has been used as input.

Table 4.4: Meteorological inputs (Summer-2015)

Time (hours)	Wind Direction (Deg.)	Wind speed (m/s)	Temp. (°C)	Relative Humidity(%)
01.00	96	4	32.9	31.6
02.00	142	1	31.1	59.2
03.00	194	0	30.1	55.3
04.00	39	1	29.4	72.8
05.00	173	1	29	73.6
06.00	194	0	27.6	72.8
07.00	196	1	26.6	61.2
08.00	206	1	26.4	56.6
09.00	177	3	28	53.2
10.00	127	1	30.9	39.5
11.00	134	1	32.2	45.4
12.00	120	1	33.7	33.5
13.00	111	8	34.3	38.1
14.00	224	9	33.4	56.3
15.00	125	4	33.8	51.9
16.00	131	4	34.4	51.7
17.00	160	6	33.4	51.2
18.00	146	4	33.5	54.3
19.00	152	6	32.8	52.9
20.00	132	3	32.2	54.7
21.00	120	3	31.4	65.2
22.00	141	4	30.7	71.5
23.00	160	4	30.4	76.1
24.00	149	1	29.9	82.1

The prediction of Ground level concentrations (GLC) of pollutants emitted from all the sources have been carried out using AERMOD Air Quality Simulation model released by USEPA. This model is basically a Gaussian dispersion model which considers multiple sources. The model accepts hourly meteorological data records to define the conditions of plume rise for each source and receptor combination for each hour of input meteorological data sequentially and calculates short term averages up to 24 hours.

The impact has been predicted over a 10 km X 10 km area with the proposed location of the stack as the center. GLCs have been calculated at every 500 m grid point. In the present study, GLCs are predicted for 24hrs averages.

Meteorological data plays an important role in computation of Ground Level Concentration using AERMOD model. Meteorological data of the project site is required for computation of the contribution by the proposed expansion. The actual monitored site meteorological data for one full season of Summer, 2015 has been considered. The meteorological data was generated for three months period on hourly basis.

For predicting impacts on ambient air quality only the additional emissions from the proposed incinerator and other activities as mentioned above have been considered for GLC estimation. As the present contribution from the existing activities are already being reflected in ambient air, the predicted GLCs have been superimposed on ambient air quality data collected within the study area.

The Isopleths of PM_{10}, SO_2 and NOx for the future scenario are presented in **Fig. 4.7a, Fig. 4.7b** and **Fig. 4.7c.**

Maximum values of the background concentration are taken and added to the predicted values at the respective stations to predict future scenario as given in **Table 4.5**.

Table 4.5: Cumulative Impact at AAQ monitoring stations

AAQ Station	PM_{10}			SO_2			NOx		
	Monitored	**Predicted**	**Total**	**Monitored**	**Predicted**	**Total**	**Monitored**	**Predicted**	**Total**
Alang Fire Stn.	79.8	0.30	80.10	7.3	0.45	7.75	31.7	0.43	32.13
Alang Village	77.2	0.14	77.34	7	0.21	7.21	22.8	0.99	23.79
Sosiya	73.7	0.07	73.77	6.1	0.10	6.20	20.5	0.24	20.74
Mathavda	67	0.17	67.17	6.3	0.26	6.56	21.4	0.24	21.64
Kathava	72.8	1.02	73.82	5.5	1.53	7.03	21.2	0.84	22.04
All values in $\mu g/m^3$.									

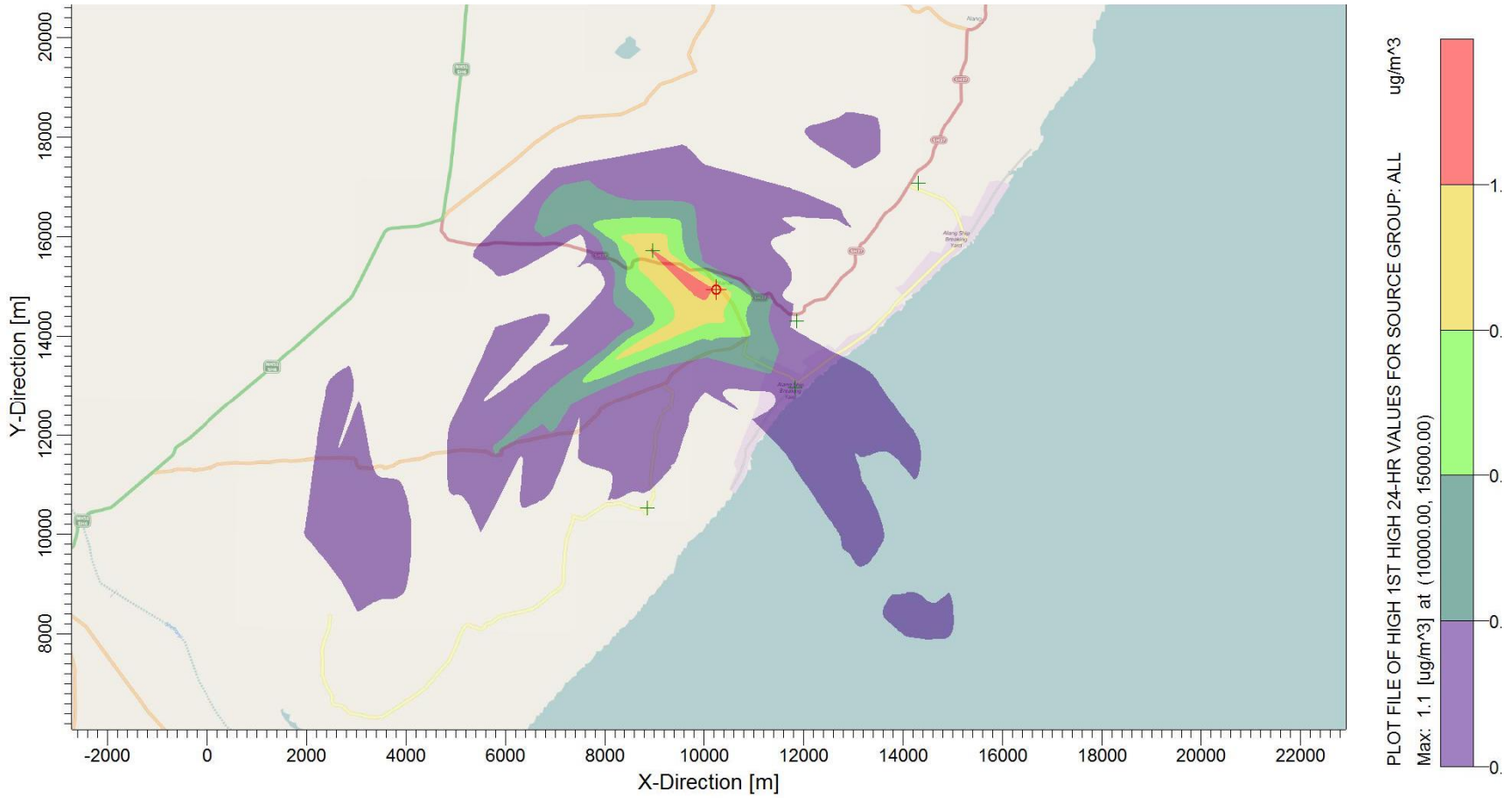


Fig. 4.7a: Isopleths of PM_{10} Dispersion due to Proposed New Incinerator

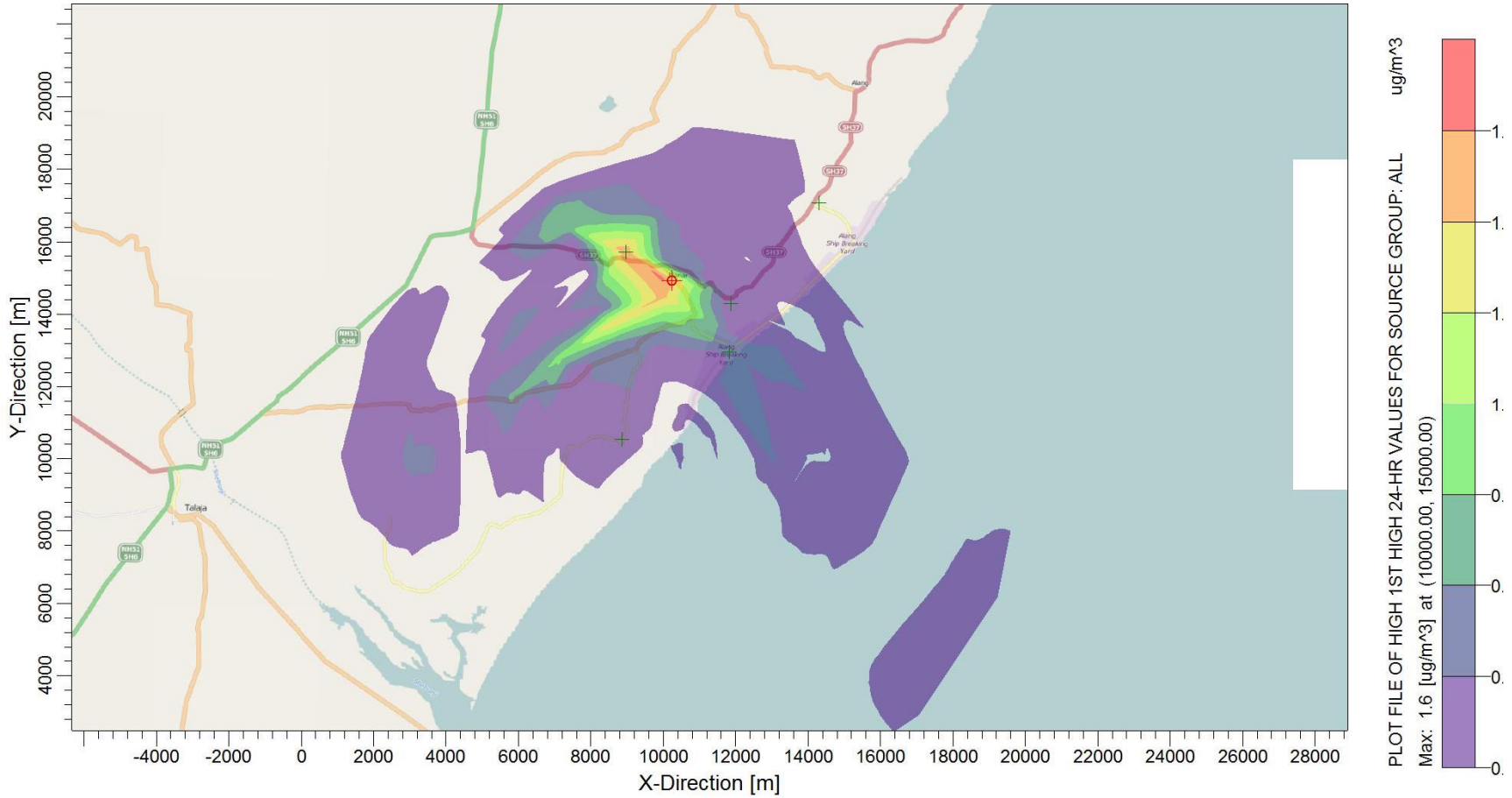


Fig. 4.7b: Isopleths of SO_2 Dispersion due to Proposed New Incinerator

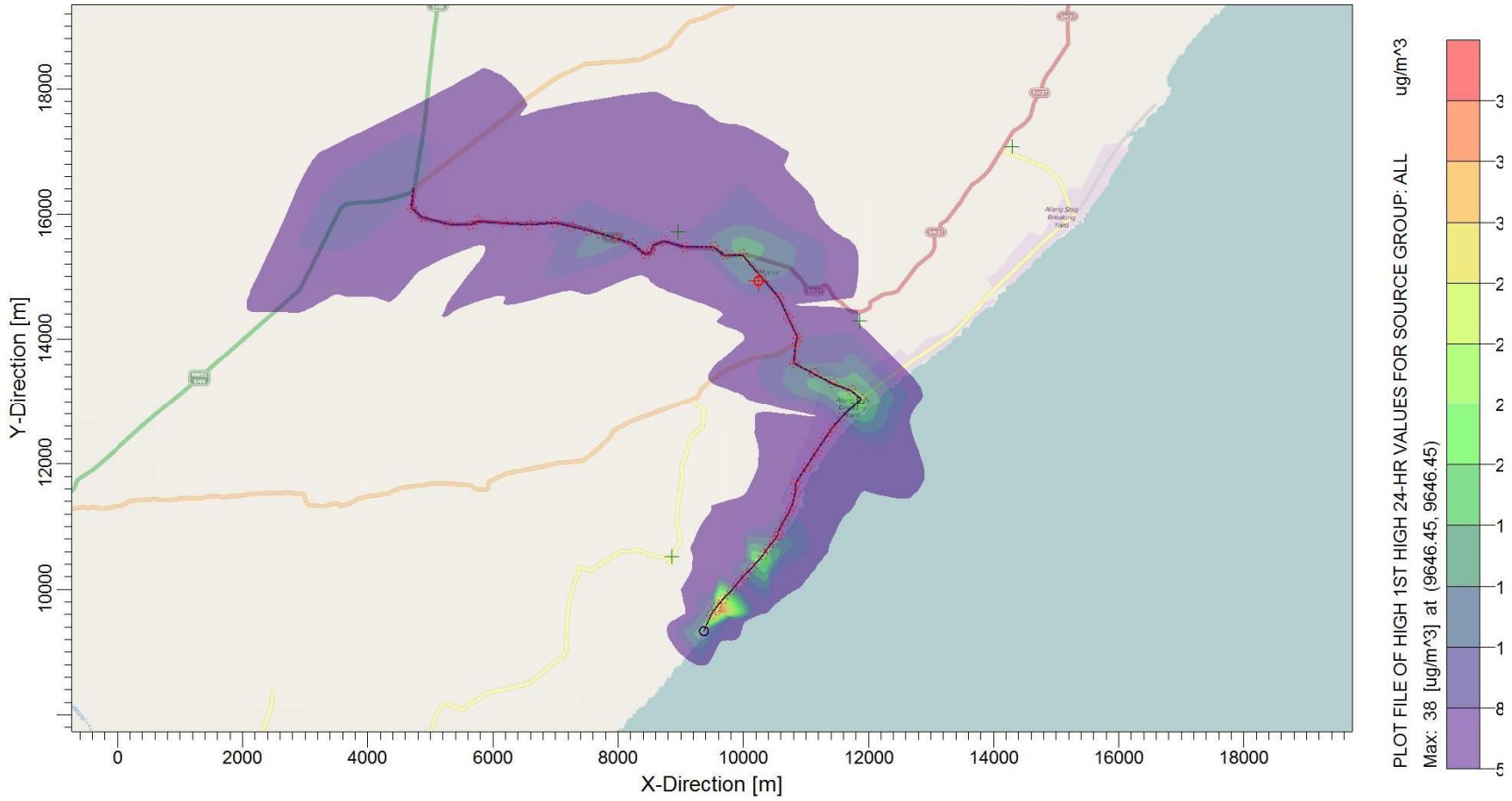


Fig. 4.6c: Isopleths of cumulative NOx Dispersion due to Proposed Project

The predicted values for PM_{10} are very small. However, on adding these values with the monitored maximum background concentrations, the values are exceeding the norm. This may be due to the localized effect of salt spray in coastal regions.

Predicted values of SO_2 are found well within the norms.

Maximum monitored value for NOx emission was 31.7 µg/m^3. Maximum predicted values from vehicular emissions and stack emissions which are contributing to the Ambient Air Quality are 18.48 µg/m^3 and 3.06 µg/m^3respectively. On adding these values to the maximum monitored concentration, all the predicted values of GLCs are well within the AAQ norms. However, maximum predicted values from Work zone air quality is 37.3 µg/m^3. On adding this value to maximum monitored background concentration, predicted values of GLCs is within the work zone air quality norms.

In addition to the above NOx is also emitted from fuel burning at the numerous eateries in Alang Notified Area, which serve the workers and visitors. It has been estimated that these eateries serve about 15000 people daily. About half of these eateries use LPG or kerosene. The rest especially the smaller ones use fire wood. It has been estimated that these eateries emit about 4.65 kg/day of NOx. Since these eateries are spread over the entire Alang area, these emissions are diluted and dispersed to the extent that their effect is negligible.

Fugitive dust is generated due to handling of rusted steel plates on the beach and operation of trucks on road serving the project. Iron dust is hard and heavy. It does not spread beyond the ship recycling plots. As has been mentioned earlier, the pavement of the ship-recycling area will be concreted, which will greatly reduce fugitive dust generation.

All the materials recovered during ship recycling are despatched by trucks. Fugitive dust is likely to be generated from the roads. However, the dust generation has be reduced by having wide metalled roads which is kept in good repair. The road running the length of the yard has been converted into a concrete road which has reduced fugitive dust generation.

Photo 4.m: SH-37 which serves Alang-Sosiya SRY

Ships contain ammonia and / or ChloroFluoro Carbons (CFCs) in the refrigeration systems. Halons may be present in firefighting systems. Ammonia is toxic and even in small quantities causes irritation in the eyes and respiratory tract. Excess exposure may be fatal. CFCs and halons are ozone depleting substances.

4.6.2 Management measures

In the study area, the existing air quality is within the norms for residential areas as specified by the National Ambient Air Quality Standards (NAAQS). The proposed project is not expected to raise air pollution levels significantly.

Ammonia present in the ships' refrigeration systems is vented off at a distance from shore before the ships departs grounding. During ammonia venting, water may be sprayed to absorb the gas which is very highly soluble. CFCs and Halons are extracted from refrigeration / firefighting systems by persons specifically trained and authorized to do so. The recovered material is sold only to authorized dealers.

Fugitive dust easily settles down. Nevertheless the following measures are being undertaken:

- To control dust from operations at the ship-recycling facility, water is sprinkled on the plots to suppress fugitive dust.
- To reduce fugitive dust generation from transport roads, the roads from the ship recycling yard to the national road network, have been converted into concrete roads or upgraded. The pavement of these roads will always be kept in good repair which will not only reduce fugitive dust generation but also emissions from trucks' engines due to lower fuel consumption.
- Gaseous pollutants in the exhaust fumes generated by diesel powered machinery are minimized by ensuring vigorous maintenance adhering to stringent overhaul schedules.

- ❖ All personnel engaged in performing abrasive work (e.g. stripping paint from surfaces prior to gas cutting), cleaning dusty surfaces and handling dusty material are issued dust masks and wearing the same is strictly enforced. (Measures for control of asbestos dust have been described separately).
- ❖ Open burning of plastics, PVCs, polystyrene etc., which may lead to generation of poisonous gases such as dioxins, is not allowed. All combustible wastes are collected sorted and as deemed necessary are dispatched to Alang TSDF for proper incineration.
- ❖ A green belt will be developed along the side of the roads to screen fugitive dust generated from the roads.

4.7 NOISE ENVIRONMENT

4.7.1 Anticipated Impacts

The existing noise level in the study area, as measured is 78 to 41.4dB(A) during day time and 50.4 to 40.5 dB(A) at night (Refer Table 3.18, in Chapter 3). The major noise generating activity at the yardare operation of diesel powered material handling machinery, handling of large pieces of metal (some weighing several tonnes a piece) and trucks carrying away recovered materials. At present the number of truck plying on the road is 1216 / day (Ref. Table 3.37). The increase in truck traffic willdouble (as at present the yard is operating at ~2.8 Mt/yr). This increase may increase the background noise levels by ~8 dB(A).

Noise level is likely to increase in the project area as the project becomes fully operational. The noise levels of the diesel powered machinery which will operate at the yard are mostly 75 – 80 dB(A) at 10 m distance. In addition to noise generated by diesel powered machinery, noise will also be generated on account of handling of metal. In the ship-recycling yard the personal exposure shall be less than 90 dB(A).

For hemispherical sound wave propagation through homogeneous medium, one can estimate the noise levels at various locations due to different sources using a model based on the following principle :

$L_{p2} = L_{p1} - 20 \text{ Log}_{10} (r_2/r_1)$, where L_{p1} and L_{p2} are the sound levels at points located at distance r1 and r2 from the source. This indicates that noise level decreases by 6 dB(A) for doubling of the distance.

Combined effect of all the sources (A,B,C,…. Etc.) can be determined at various locations by the following equation:

$L_{ptotal} = 10 \text{ Log}_{10} (10^{Lpa/10} + 10^{Lpb/10} + 10^{Lpc/10} \ldots\ldots\ldots\ldots)$,

where Lpa, Lpb and Lpc are noise pressure levels at a point due to different sources.

Considering that the noise levels in the just outside the ship-recycling facility at a distance of 50 m is78 dB(A) [the maximum noise level at Alang Fire Station, which is ~50 from the nearest plot], the noise levels on account of the project only at different distances from the project site are illustrated in **Fig. 4.8**.

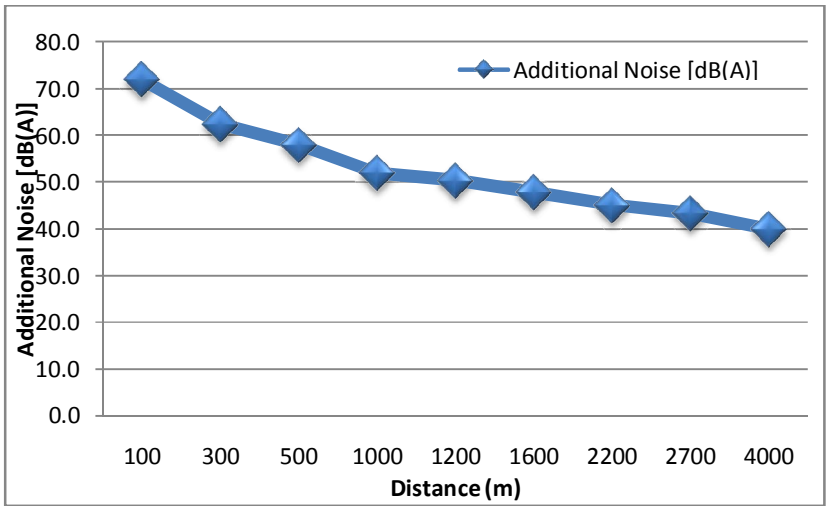


Fig. 4.8:Noise Levels on Account of the Expansion Project at Different Distances without Considering Atmospheric Attenuation and Attenuation from Barriers like Noise Barriers and Greenbelt.

The expected noise levels at nearby villages due to the proposed expansion project are given in **Table 4.6**:

Table 4.6: Resultant Noise Levels at Nearby Villages due to proposed Project

Village	Distance from Project site (km)	Max. Existing Noise Level [dB(A)] *	Addl. Noise due to Project [dB(A)]	Resultant Max. Noise [dB(A)]
Mathavda	1.0	52.7	52	55.4
Alang	1.0	56.6	52	Prevailing
Sosiya	1.2	61.3	50.4	Prevailing
Kathava	4.0	60.4	40	Prevailing
Bharpara	1.6	57.1	47.9	57.6
Chopada	2.7	56.2	43.4	56.4
				** Refer Table 3.18*

Thus from the above table it can be observed that the activities at the proposed expansion area of project may marginallyaffect the ambient noise levels at the nearest villages in the study area. Those at a distance will not be affected.

In case of traffic, noise levels decrease @ $10\log_{10}(R/R_{ref})$ due to divergence + @ $5\log_{10}(R/R_{ref})$ due to ground effect, where R is the distance of the receptor and R_{ref} is the distance from the source where the noise level is measured. This indicates that traffic noise levels decrease @ 4.5 dB(A) for doubling of the distance.

Measures suggested below shall reduce the noise level.

4.7.2 Mitigation measures

Noise level shall be maintained below 90 dB (A) in work zone (for 8 hours exposure).Noise levels are expected to increase due to increased handling of steel scrap and use of diesel powered machinery. The following measures will be taken to reduce noise levels.

- Diesel powered machinery, which are major source of noise in scrap yards, will be properly maintained as per maintenance schedule to prevent undesirable noise. Attention shall be paid towards rigorous maintenance of the silencers of diesel engines
- Static diesel engines will be housed as far as possible (not made of sheet metals) or surrounded by baffles. Wherever possible they will be placed on vibration isolators.
- Crane operatorsand winchoperators are issued earmuffs. Wearing personal protective equipment is compulsory and the Safety Officer / Supervisor of each plotshall carry out regular inspections to this effect. Duty hours of operators of noisy machinery may be regulated to keep their noise exposure levels within limits.
- Dispatch of materials by trucks will be regulated such that, the traffic is evenly distributed. This will avoid congestion and consequent excessive noise and vehicular emissions.

4.8 BIOLOGICAL ENVIRONMENT

4.8.1 Anticipated Impacts

As already indicated, expansion area of the project will be located mostly on barren lands and scrub lands. The flora and fauna found in this area has been described in Chapter 3under Clause 3.4.5.

As regards impact on wildlife is concerned, most of the wild life in the project areas and its vicinity are confined to common small species, found on the outskirts of villages in most parts of India.

The project area's marine bio-diversity is low. There is no large scale fishing activity. Hardly half a dozen or so fishing boats (all of them converted lifeboats salvaged from scrapped ships) are operating in the area. Due to implementation of stringent water pollution control measures, as described under Clause 4.4.2 above, no untreated effluents or solid wastes will be discharged into the marine environment. Therefore marine flora and fauna will not be affected on this account.

4.8.2 Mitigation Measures

6 ha of plantations will be created within the initial5 years. Plant species suitable for plantation should not only be able to flourish in the area but must also have rapid growth rate, evergreen habit, large crown volume and small / pendulous leaves with smooth surfaces. All these traits are difficult to get in a single species. Therefore a combination of these is sought while selecting trees for green belt / vegetation cover. The green belt should be planted close to the source or to the area to be protected to optimize the attenuation within physical limitations. Plantation will serve the following purposes:

- Prevent the spread of fugitive dust generated due material handling
- Attenuate noise generated by the project.
- Increases green cover and improve aesthetics.

The species selected for plantation must be locally growing varieties with fast growth rate and ability to flourish even in poor quality soils. The following species are suitable for planting in the area:

Acacia nilotica	*Zizyphus spp.*	*Prosopis cineraria*
Salvadora persica	*Ficus bengalensis*	*Syzigium cuminii*
Azadirachta indica	*Bombax ceiba*	*Pongamia pinnata*
Ailanthus excelsa	*Ficus religiosa*	

All these species are already part of the area's natural vegetation. They yield fruits which are relished by birds and wild animals, who also scatter their seeds. Some attract insects which are food for birds.

Saplings will be planted at 3 – 3.5 m intervals. The pits will be filled with a mixture of good quality soil and organic manure (cow dung, agricultural waste, kitchen waste). The saplings will be planted just after the commencement of the monsoons to ensure maximum survival.

4.9 OCCUPATIONAL SAFETY & HEALTH

4.9.1 Anticipated Impacts

The work place is divided in terms of activities e.g. dismantling, metal cutting, material removal, material sorting, loading etc. The principal occupational risks in ship recycling are:

- ❖ Failure of winches and / or snapping of winching lines during ship-winching
- ❖ Asbestos exposure
- ❖ Fire and explosion
- ❖ Inhalation of toxic gasses
- ❖ Working in confined spaces where suffocating / toxic / inflammable gases may be present

- ❖ Accidents involving falling of material from height
- ❖ Accidents involving fall from height
- ❖ Accidents during metal cutting
- ❖ Diseases due to dust inhalation
- ❖ Hearing loss
- ❖ Accidents involving material handling equipment during
  - Carrying of big pieces of ship to the plot
  - Separating parts other than metals from the ship
  - While loading and unloading of LPG and Oxygen Cylinders
  - Carrying of heavy material from one place to another
  - While removing furniture from the ship
  - While sorting the scrap

Category wise deployment of workers in hazard prone areas shall be as follows:

Sl. No.	Hazardous Operation	Duration of involvement (hrs/day)
1	Winching of ship	8 (not regularly)
2	Asbestos removal and handling	8 (not regularly)
3	Ship Cutting	8
4	Dismantling of detachable items	8
5	Material sorting loading	8

The cause of fatal accidents is illustrated in **Fig.4.9.**

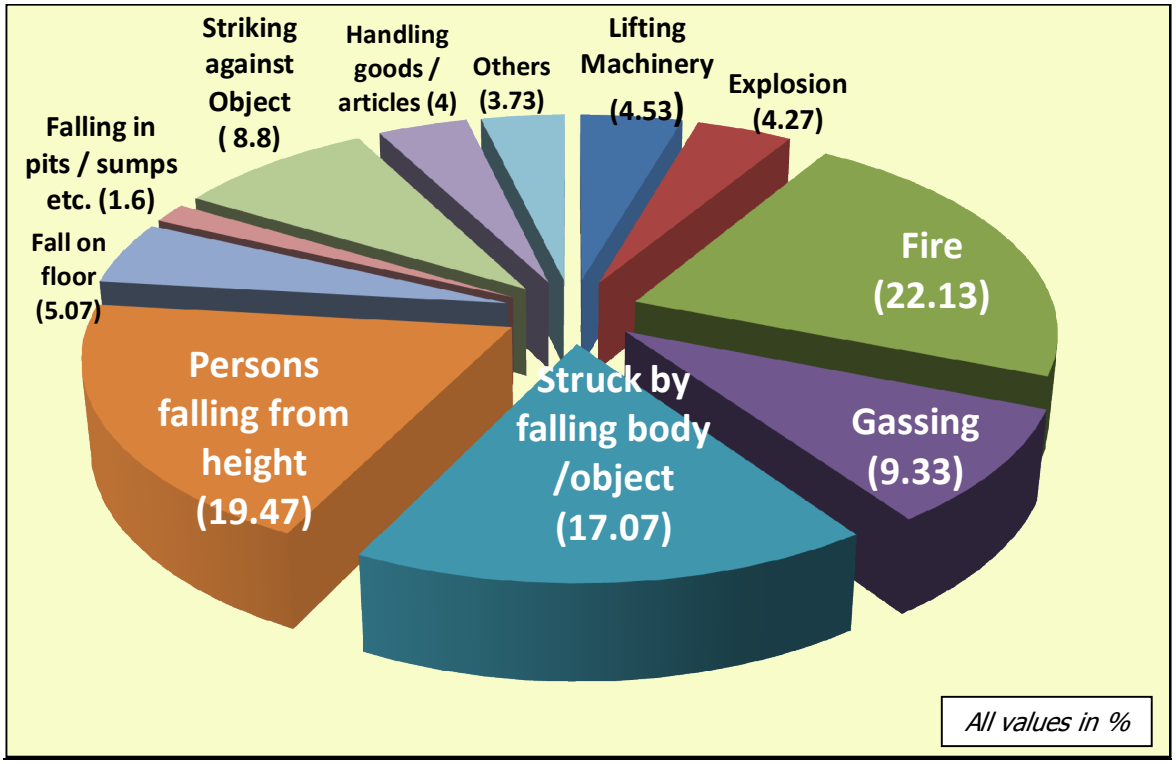


Fig. 4.9: Causes of Fatal Accidents

From the above figure it is obvious that fires (without explosion), fall from heights, striking by falling objects and gassing account for about 2/3 of the fatalities. The occurrences of these accidents can be greatly reduced by strict enforcement of safety rules / procedures and indoctrinating / training workers in use of safety equipment and following of safety procedures. In this regard GMB has set up a Training Institute at Alang for imparting safety training to workers. **Fig. 4.10** shows how no. of fatalities have reduced with increased training of workers.

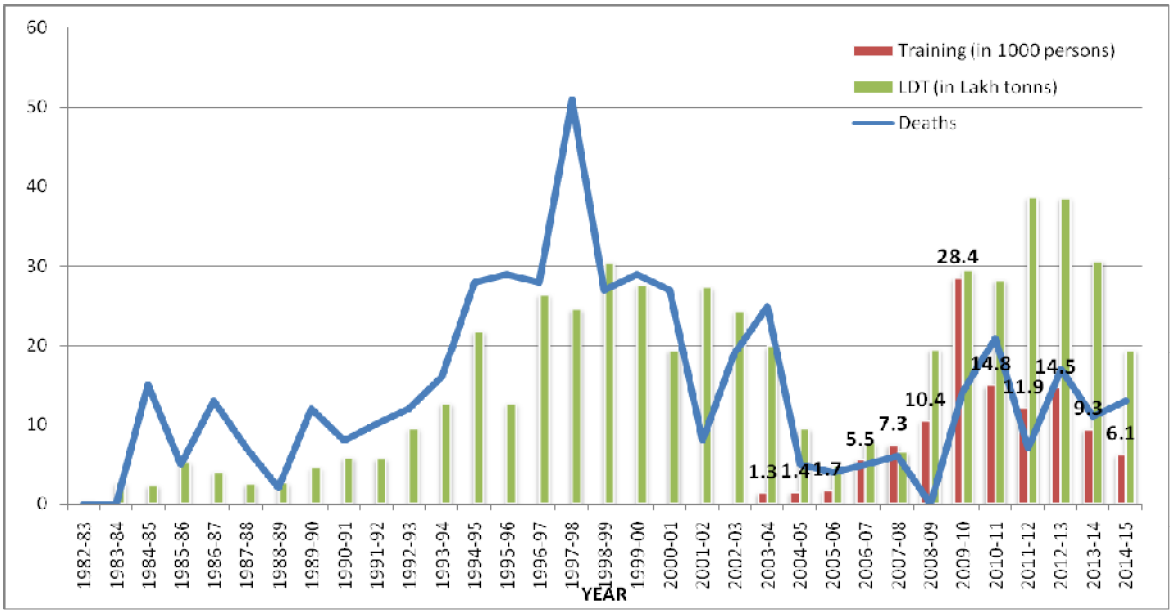


Fig. 4.10: Impact of Safety Training

4.9.2 Management Measures

Rules and Safety guidelines as stipulated in the Indian Factories Act, 1948 and Gujarat Factories Rule, 1963 are followed.

Risk assessment will be carried out in the yard on a regular basis. The goal for each risk assessment session is to identify hazards, determine risk ratings and controls and to review the implementation of risk controls from previous risk assessment sessions.

Assessed risks and steps for prevention and control of loss / damage due to accidents shall be communicated to employees through hoardings, boards, posters and internal company communications.

Health impact assessment will be carried out through:

- Surveillance of the factors in work zones and work practices, which may affect workers' health.
- Periodical medical examination (PME).

All workers undergo a Pre-Employment Medical Examination which is organized by Ship Recycling Industries Association (India) [SRIA]. In this regard SRIA has entered into long term agreements with two private doctors who have the necessary qualifications and access to resources for undertaking the necessary medical examinations. The pre-employment medical examinations cover:

- General Physical examination
- Tuberculosis
- Contagious Diseases
- Chest X-Ray
- Lung Function Test
- Vision
- HIV and Sexually Transmitted Diseases (at random only).

GMB's Training Centre at Alang and SRIA jointly organize PME of workers every six months. However one problem is that only about 20% of the workers over a long period of time.

There are two ambulances available at Alang-Sosiya SRY round the clock. There is a small Hospital run by Red Cross and some small private hospitals at the SRY. These hospitals have the resources only for routine medical treatment, taking care of minor injuries (not requiring hospitalization and / or major surgery) and giving immediate relief in case of major injuries. Serious casualty cases are evacuated to well-equipped hospitals at Alang. The cost of medical treatment is borne by the owner of the plot where the injured worker was working.

SRIA is constructing a Trauma Centre, Health Care Centre and Welfare Centre for workers at Alang itself, which is at an advanced stage of completion. In addition a building owned by Justice Dewan Charitable Trust is being taken over by GMB which will be converted into a full-fledged hospital for Alang-Sosiya SRY workers. SRIA will bear the cost of all medical facilities.

Occupational health awareness campaign is conducted by GMB's Training Centre, SRIA's doctors as well as invited external experts.

Each Plot has a dedicated Safety Officer. He is usually assisted by one or more Safety Supervisors depending on the magnitude of operations of the plot. The new plots will also have similar arrangements. GMB's Alang Office has a Safety Department whose officers supervise the plots' safety departments. Each of the new Dry Docks will have its own Safety Officer and one or more Asst. Safety Officers. The Safety Department on each plot has multi gas meters to check for presence of inflammable and toxic gases.

The Safety Officer is responsible for the purchase and issue of all personal protective equipment (PPE) e.g. shoes, helmets, various types of gloves, aprons, dust respirators, ear plugs, goggles etc. taking employee strength into consideration and distributed to both company employees and contractors' employees. The Asbestos Removal Supervisor is responsible for purchase and

issue of PPEs to asbestos workers. Safety boots are issued every 6 months, helmets every 3 years and other PPEs as per requirement. If any PPEs are damaged before their scheduled replacement, fresh equipment are issued.

The Safety Officers are responsible for issue of all necessary safety equipment to the workers. The Safety Officers and their deputies ensure the following:

- No worker carries mobile phone to his work place lest he be distracted by attending to phone calls while working.
- All workers and visitors wear safety helmets in working areas
- All workers wear safety boots.
- All workers engaged in gas cutting wear welders' goggles, gloves and masks
- Workers engaged in abrasive work, wear goggles and masks
- Workers engaged in handling heavy items and glass wear gloves.
- Operators of heavy diesel powered machinery are issued ear plugs / ear muffs.
- Enclosed spaces on board the ships are free of flammable, suffocating and toxic gases / vapours. If any such gases are present in concentrations which may pose a threat to workers' safety, the spaces shall be purged with air till they are safe for entry of workers and for working.
- There are no inflammable liquids or gasses inside pipelines or across bulk-heads which are being cut with torches
- Cables, chains used for winching ships undamaged and rated for the weight of the ship concerned.
- Unconcerned personnel are at safe distance during winching of ships.
- The LPG godown is maintained as per guidelines.
- All LPG cylinders are kept in an upright position.
- All torches and LPG cylinders' regulators are put in "off" position at end of work or during work breaks.
- Nobody is smoking or there is any open flame nearby when fuel is being unloaded from ships.
- There are adequate number of fire fighting systems on the plots and they are in working order.
- All hazardous wastes are carefully documented, packed and stored in the designated area.
- Heavy material handling machinery give audio-visual warnings while moving heavy loads.
- Life buoys are kept on ships for use during emergency evacuation in case of major fire
- Workers working at heights are provided with safety belts / harnesses.
- All other general safety rules and guidelines are followed.

All new recruits are given basic training on safety before being actually sent to work place. This training is conducted at GMB's Training Centre and is spread over three days. Additional safety training is given to those engaged in gas cutting, winch operations, crane operations, handling of engine room, handling of glass wool and handling of fuel oil & lubricants. All workers also undergo

refresher training on safety. Certificates are issued on successful completion of training courses.

4.9.2.1 During Ship Winching

During uplifting of ship, workers are at risk in case of equipment failure (winches, winching cables.). To minimize the risk of failures, winches are regularly serviced and thoroughly overhauled. For winching of ships, cables and chains with sufficient rated capacity (including margin of safety) for the weight of the ship to be hauled are selected. The cables and chains are thoroughly examined / inspected for integrity prior to being put to use. All personnel engaged in ship winching are thoroughly trained in safety and the SafetyOfficer ensures that safety procedures are strictly followed.

4.9.2.2 During Asbestos Removal and Handling

The hazards of asbestos handling have been described earlier in this Chapter under Clause 4.2.2.1.

In order to protect workers' health, Section 41F and the Second Schedule of the Indian Factories Act, 1948 has fixed the following maximum permissible threshold limits for asbestos in work zone air:

a) Amosite : 0.5 fibre / cc * b) Chrystolite : 1.0 fibre / cc * c) Crocidolite : 0.2 fibre / cc *
* For fibres>5 µm in length and <5 µm in breadth with length: breadth ration equal to or greater than 3:1 and as determined by the membrane filter method at 4000 – 450X magnification (4 mm objective) phase contrast illumination.

The Occupational Safety & Health Administration (OSHA) has issued a comprehensive standard for Occupational Safety and Health Standard for Shipyard Employment as regards asbestos (Ref. OSHA Standard no. 1915.1001). The same is followed more or less in the project also. These measures ensure that the work zone air quality meets the stipulations of the Indian Factories Act, 1948.

For workers engaged in Class I asbestos work, a Decontamination Area is established as close as possible to the Regulated Area. It consists of:

1. Clean Change Room
2. Shower Room
3. Equipment Room.

Fig 4.11 shows the schematic layout of an Asbestos Dismantling enclosure. The specifications of the asbestos dismantling enclosure are given in **Annexure 4.3**. The enclosure is kept at negative pressure through the ventilation room which has heavy duty HEPA filters. Fresh air is drawn into the enclosure through a damper valve.

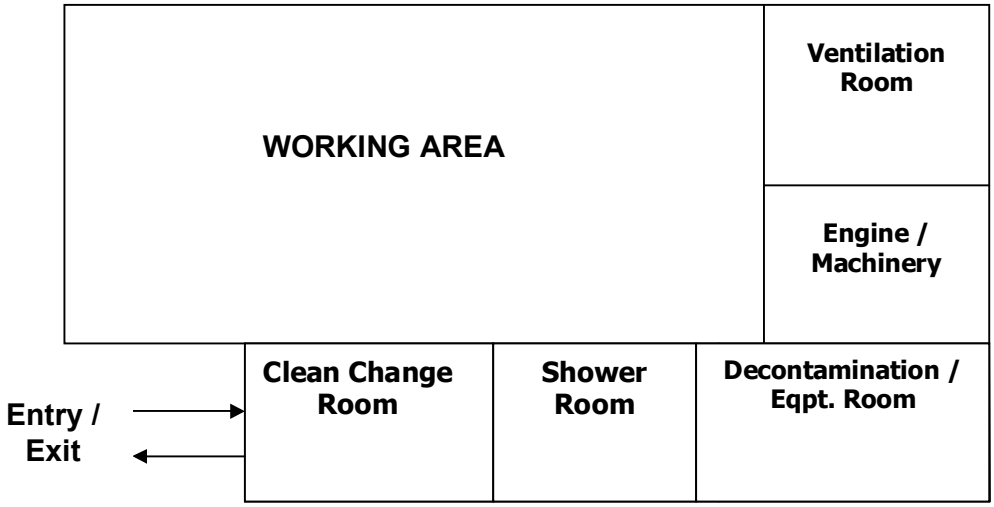


Fig. 4.11: Schematic Layout of Asbestos Dismantling Enclosure

Workers coming to work, enter the Clean Change Room first, where they deposit their street clothing in assigned lockers. They put on protective clothing consisting of whole body clothing, head coverings, gloves and foot coverings and respiratory protection. The Supervisor inspects the workers' clothing before allowing them in to the regulated area. The workers collect their working equipment from the Equipment Room and then proceed to the working area. Respirators are provided for all Class I asbestos jobs, all Class I work where the ACM is not removed in a substantially intact state and during all Class IV work performed within regulated areas where other workers are performing asbestos work requiring use of respirators. Tight fitting Powered-Air Purifying Respirators (PAPR) are provided. It should be noted that all workers engaged in asbestos work removal work requiring use of respirators must be medically certified that he shall be able to function normally while wearing respirators.

After completion of work, the workers enter the Decontamination Area of Equipment Room, where they first vacuum themselves to remove debris and contaminants deposited on their clothing; the vacuum cleaners used for the purpose are provided with HEPA filters. After vacuuming themselves, the workers remove their other clothing, gloves, caps etc., but not the respirators, and deposit them in labeled impermeable containers / bags. They then proceed to the Shower Room for a shower before proceeding to the Clean Change Room, where they remove their Respirators and put on their street clothes again. All equipment and surface of containers filled with ACM are cleaned prior to removing them from the Equipment Room. While sending the used clothes for cleaning and washing, they are packed in leak-proof labeled containers; the cleaners / washers are informed about the possible presence of asbestos on the soiled clothing and that they should take necessary protective measures. The Asbestos Removal Supervisor ensures that the procedures are strictly followed.
The Supervisor clearly demarcates all asbestos work areas in large letters in prominent colours and symbols stating "Danger", "Keep Out", "Entry of

Authorized Personnel Only", "Entry Without Wearing Protective Clothing and Respirators Forbidden; Can Cause Cancer", "No Smoking", "No Eating", "No Paan Chewing" etc. Prominent slogans spelling out proper work practices are also be displayed in the regulated areas. The languages are English, Gujrati, Hindi and other languages spoken by the workers deployed in the yard.

4.9.2.3 Fire and Exposure to Fumes / Gases

Many of the basic tasks involved in ship-breaking such as cutting metal with LPG – Oxygen torches, provide an ignition source for fires. There are many combustible materials on vessels and in ship yards, including flammable fuels, cargo, wooden structures, building materials, and litter.

At the project, LPG is used for cutting of ships. Also, fuel oil, HSD and lubricating oils remaining on board the ships are pumped out. There is also the possibility of flammable gas mixtures remaining on board in cargo tanks of tankers / gas carriers. The oxygen-enriched atmosphere in enclosed or confined spaces may cause the normally fire-resistant materials to catch fire when cutting torches are used. When fires occur, the confined or enclosed spaces of work make the escape difficult or almost impossible for the workers working in those areas. Fire in such confined or enclosed spaces may also result in atmospheres of combustible gases, toxic fumes, or oxygen-depleted air.

Workers in the ship breaking yards, therefore, face risk from fire, explosions, toxic gases, and fume that can result in burns, death, and asphyxia. Workers are also at special risk when fighting fires in ship breaking yards. Fighting fires at landside facilities in shipyards can be similar to traditional firefighting at typical industrial manufacturing facilities.

Firefighting onboard is considerably different from structural firefighting. When traditional structural firefighting techniques are used on a vessel fire, the result can be ineffective and even catastrophic. The potential is much greater for serious injury to firefighting personnel when tactics do not reflect the unique nature of fire fighting on ships. It is important for the ship breaking yards to not only have a yard-specific Fire Safety Plan but also to have fire department trained adequately to handle on-vessel fires and fire accidents occurring in confined spaces. The plan must provide for the routine inspection, maintenance, and replacement of this equipment and mandate training for new workers and refresher training for all shipyard employment workers. The plan must include procedures for the control of fire hazards, such as flammable and non-flammable compressed gases, ignition sources, combustible materials, welding and hot work operations, and must include procedures for evacuation.

At the project, it is mandatory that all tankers' / gas carriers' cargo tanks and pipelines are purged with inert gas, using on-board inert gas generating systems, prior to the ship being allowed to be beached. Prior to cutting, Hot Work Certificate has to be obtained from the concerned authorities who ensure that no flammable gases or liquids are remaining on board.

On board the ships, sufficient numbers of portable fire extinguishers are kept ready near operations involving flammable materials.

GMB has a dedicated FireFighting Department atAlang-Sosiya SRY equipped with following fire-fighting equipment:

- 2 nos. water browsers (each of 16 kl capacity)
- 1 no. high pressure mini fire tender
- 4 nos. multipurpose fire tenders
- 2 nos. water tankers (each of 10 kl capacity)
- 4 nos. fire proximity suits
- 2 nos. breathing apparatus
- 1 no. foam generator (small)
- 2 nos. portable combined water-cum-foam monitors of 1700 l/minute capacity

The Fire Fighting Department is headed by the Station Officer. At present 16 fire crew are on duty. 17 additional vacancies are being filled.

Individual plots have sufficient numbers of portable fire extinguishers. Major incidents will be dealt by GMB's fire department.

Workers engaged in cutting cargo tanks of oil / gas / chemical tankers may be exposed to flammable and / or toxic gases. To prevent the same, all such areas have to be made gas free prior to the ship being granted permission for beaching. Hot work certificate has also to be taken as part of the prior to cutting (Refer Chapter 2, Clause 2.6.3 and Annexure 2.3). Nevertheless, the atmosphere inside enclosed spaces is tested with gas meters for presence of explosive and toxic gas mixtures prior to workers entering such areas. This is especially important in cases where the spaces:

- That have been sealed
- Spaces and adjacent spaces that contain or have contained combustible or flammable liquids or gases.
- Spaces and adjacent spaces that contain or have contained corrosive / toxic / irritant solids, liquids or gases.
- Spaces and adjacent spaces that have been fumigated.
- Confined spaces that have been freshly coated or painted.

Workers are not allowed to work in confined spaces where the atmospheric oxygen content is less than 19.5% (by volume) or more than 22% (by volume) except for emergency rescue or for a short duration for installation of ventilation equipment necessary to start work in the space, provided:

- No ignition sources are present
- The atmosphere in the space is monitored continuously
- Atmospheres at or above the Upper Explosive Limit (10% hydrocarbon content by volume) are maintained
- The workers are provided with respirators and other personal protective equipment

If an enclosed space, whose atmosphere is considered unsafe, is found, the same is prominently labeled warning workers to stay away. The space is ventilated till:

- Flammable vapour is maintained below 10% of lower explosive limit(1% hydrocarbon content by volume)
- Toxic, corrosive or irritant vapours are maintained within permissible exposure limits and below IDLH levels.

While workers are working in enclosed spaces, heavy duty blowers may be used to ventilate the work areas and prevent buildup of gases generated due to LPG burning.

4.9.2.4 During Ship Cutting

The process of ship cutting involves stripping paint from surfaces which will be cut followed by cutting with LPG-oxygen torches.

Usually paint is stripped by chipping and rubbing with wire brushes. During this process, workers are at risk on account of flying off of paint chips which may damage the eyes and inhalation of paint dust which may contain heavy metals and toxic additives. To prevent the same, workers engaged in paint chipping and cleaning are asked to wear goggles and dust masks.

Metals are cut with LPG-oxygen torches. During these operations workers are at risk due to:

1. Fire and explosion
2. Exposure to very high temperatures and intense light
3. Inhalation of toxic fumes.

While handling LPG, all necessary fire safety rules are followed. All LPG and oxygen cylinders are kept erect and shored to ensure that they remain in the erect position. Safety Officers and supervisors ensure the same. It is mandatory for workers to use welders' goggles / masks to protect their eyes and faces from intense heat and light. Fire-retardant gloves are used to protect the workers' hands. Workers may also be issued with fire retardant suits and gas masks. On board the ships, the work areas are adequately ventilated to prevent buildup of combustion gases and dissipate the heat generated due to LPG burning.

Before taking breaks and at end of shifts concerned workers ensure that all torches are extinguished and valves / regulators of gas cylinders are turned to the "Off" position. Safety supervisors ensure the same.

4.9.2.5During Dismantling of Detachable Items

All workers deployed on board the ships wear safety helmets. Areas below areas where dismantling work is on shall be cordoned off. Workers engaged in dismantling work wear safety gloves while handling heavy / sharp / breakable objects. Workers working at height wear full body safety harnesses and safety

belts. Safety Officers / Safety Supervisors of individual plots enforce safety regulations and practices.

4.9.2.6 Material Sorting and Loading

Wearing of safety helmets is strictly enforced amongst all personnel working on board the ships and in material handling areas. Workers engaged in handling heavy material and objects with sharp edges are issued safety gloves. Areas below heavy lifts may be cordoned off. There are audio-visual warnings while mobile cranes are moving heavy objects. Cables, ropes and chains used for hauling / lifting are regularly inspected and tested.

4.10 HOUSEKEEPING

It is necessary to maintain a clean working area and surroundings for:

- Avoiding fire hazards
- Optimum utilization of the limited space available on the plots
- Ensuring hassle free evacuation during emergencies
- Reduction in pollution
- Maintenance of good relationship with nearby communities
- Good aesthetics

4.10.1 <u>On the Ship Recycling Plots</u>

- On the plots, LPG, oxygen cylinders and other tools are / will be stored only in designated and clearly marked areas.
- Similarly there will be designated areas for temporary storage and sorting of recovered materials.
- All the plots have separate stores for temporary storage of sorted and packed waste materials.
- Vehicles and mobile cranes are also parked in designated areas.
- Oil-covered / greased cables / chains and pulleys used for material handling operations are / will be stacked on a sloped cemented area with oil collection pits.
- Safety hoardings and slogans are prominently displayed on the plots.
- Facilities have been provided on plots for workers to wash themselves before meal breaks and at the end of their shifts

Photo 4.i: Facilities for Segregation & Storage of Wastes on Plot

Photo 4.j: Oily Cables Stacked Properly

Photo 4.k: Displayed Safety Slogans

4.10.2 In Surrounding Areas

- Toilet facilities are available for workers on all plots. However only five nos. public toilet blocks are available for visitors and other people who work outside the plots, all of them along the service road running the length of the yard; none in the material processing areas. It is suggested that more public toilets be constructed at regular distances, especially along the road leading to Trapaj and in the expansion area. Their locations should be clearly displayed. Modular toilets recovered from ships may be installed along-side the roads. Some such toilets have been installed but their numbers are very small; more needs to be done.
- Plot side and road side solid wastes are periodically collected and trucked to Alang TSDF.

4.11 SOCIO ECONOMICS

Socio-economic survey findings and secondary data have been discussed in Chapter 3 under clause3.6, Social impact assessment is included in Chapter 7 under clause 7.2 and management measures are detailed in Chapter 6.

Annexure 4.1 Standard Format of the Advance Notification Form for waste delivery to port reception facilities

Notification of the delivery of waste to: …….. (*Enter name of the port or terminal*)

The master of a ship should forward the information below to the designated authority at least 24 hours in advance of arrival or upon departure of the previous port if the voyage is less than 24 hours This form shall be retained on board the vessel along with the appropriate Oil RB, Cargo RB or Garbage RB

DELIVERY FROM SHIPS (ANF)

1. **Ship Particulars**

1.1 Name of ship:	1.5 Owner or operator:
1.2 IMO number:	1.6 Distinctive number or letters:
1.3 Gross tonnage:	1.7 Flag state:
1.4 Type of Ship Oil tanker ☐ Chemical tanker ☐ Bulk Carrier ☐ Container ☐ Other cargo ship ☐ Passenger ship ☐ Ro-Ro ☐ Other (specify) ☐	

2. Port and Voyage Particulars

2.1 Location/Terminal name and POC:	2.6 Last Port where waste was delivered:
2.2 Arrival Date and Time:	2.7 Date of last delivery:
2.3 Departure date and time:	2.8 Next port of delivery (if known):
2.4 Last port and country:	2.9 Person submitting this form is (if other than the master):
2.5 Next port and country (if known):	

3. Type and Amount of Waste for Discharge to Facility

MARPOL Annex I-Oil	**Quantity (m^3)**
Oily bilge water	
Oily residues (sludge)	
Oily tank washings	
Dirty ballast water	
Scale and sludge from tank cleaning	
Other (please specify)	
MARPOL Annex II-NLS	**Quantity (m^3)/Name**[1]
Category X substance	
Category Y substance	
Category Z substance	
OS-other substances	
* Indicate the proper shipping name of the NLS (Noxious Liquid Substance) involved	

MARPOL Annex IV-Sewage	**Quantity (m^3)**

MARPOL Annex V-Garbage	**Quantity (m^3)**
Plastic	
Floating dunnage, lining or packing material	
Ground-down paper products, rags, glass, metal bottles, crockery etc.	
Cargo residues#, paper products, rags, glass, metal, bottles, crockery etc.	
Food waste	
Incinerator ash	
Other wastes (specify)	
# Indicate the proper shipping name of the dry cargo	

MARPOL Annex VI-Air Pollution	**Quantity (m^3)**
Ozone-depleting substances and equipment containing such substances	
Exhaust gas-cleaning residues	

Please state below the approximate amount of waste and residues remaining on board and the percentage of maximum storage capacity. If delivering all waste on board at this port, please strike through this table and tick the box below. If delivering some or no waste, please complete all columns.

I confirm that I am delivering all the waste held on board this vessel (as shown on Page 1) at this port

TYPE	**Maximum dedicated storage capacity (m^3)**	**Amount of waste retained on board (m^3)**	**Port at which remaining waste will be delivered (if known)**	**Estimate amount of waste to be generated between notification and next port of call m^3**
MARPOL Annex I-Oil				
Oily bilge water				
Oily residues (sludge)				
Oily tank washings				
Dirty ballast water				
Scale and sludge from				
tank cleaning				
Other (please specify)				
MARPOL Annex II-NLS				
Category X substance				
Category Y substance				
Category Z substance				
OS-other substances				
MARPOL Annex IV-Sewage				
Sewage				
MARPOL Annex V-Garbage				
Plastic				
Floating dunnage, lining				
or packing material				

TYPE	**Maximum dedicated storage capacity (m^3)**	**Amount of waste retained on board (m^3)**	**Port at which remaining waste will be delivered (if known)**	**Estimate amount of waste to be generated between notification and next port of call m^3**
Ground paper products,				
rags, glass, metal bottles,				
crockery				
Cargo residues2, paper				
products, rags, glass,				
metal, bottles, crockery				
Food waste				
Incinerator ash				
Other wastes (specify)				

Date: …… Name and Position: ……

Time: …… Signature:……[1]

Annexure 4.2: Ballast Water Reporting Forms (IMO)

BALLAST WATER REPORTING FORM
(To be provided to the Port State Authority upon request)

1. SHIP INFORMATION

Ship's Name:	**Type:**	**IMO Number:**	**Specify Units: M^3, MT, LT, ST**
Owner:	**Gross Tonnage:**	**Call Sign:**	**Total Ballast Water on Board:**
Flag:	**Arrival Date:**	**Agent:**	
Last Port and Country:		**Arrival Port:**	**Total Ballast Water Capacity:**
Next Port and Country:			

2. BALLAST WATER

3. BALLAST WATER TANKS **Ballast Water Management Plan on board? YES NO Management Plan Implemented? YES NO**
Total number of ballast tanks on board: _____ No. of tanks in ballast: _____ IF NONE IN BALLAST GO TO No. 5.
No. of tanks exchanged: _____ No. of tanks not exchanged: _____

4. BALLAST WATER HISTORY: RECORD ALL TANKS THAT WILL BE DEBALLASTED IN PORT STATE OF ARRIVAL; IF NONE GO TO No. 5.

Tanks/ Holds (List multiple sources per tank separately)	BALLAST WATER SOURCE				BALLAST WATER EXCHANGE Circle one: Empty/Refill or Flow Through					BALLAST WATER DISCHARGE			
	DATE DDMMYY	**Port or Lat/Long**	**Volume (units)**	**Temp (units)**	**DATE DDMMYY**	**Endpoint Lat/Long.**	**Volume (units)**	**% Exch.**	**Sea Hgt. (m)**	**DATE DDMMYY**	**Port or Lat/Long**	**Volume (units)**	**Salinity (units)**

Ballast Water Tank Codes: Forepeak = FP, Aftpeak = AP; Double Bottom = DB; Wing = WT; Topside = TS; Cargo Hold = CH; Other = O

IF EXCHANGES WERE NOT CONDUCTED, STATE OTHER CONTROL ACTION(S) TAKEN:_____
IF NONE STATE REASON WHY NOT:_____

5: IMO BALLAST WATER GUIDELINES ON BOARD **(RES. A.868(20))? YES NO**
RESPONSIBLE OFFICERÕS NAME AND TITLE (PRINTED) AND SIGNATURE**:** _____ BALLAST WATER

Ship ..... Port of Registry ..... IMO number .....

TANK LOCATION	DATE	INITIAL CONTENT (tonnes)	FINAL CONTENT (tonnes)	GEOGRAPHIC LOCATION OF SHIP (Port or Lat. & Long.)	PUMPS USED, or GRAVITATE	DURATION OF OPERATION	SALINITY	SIGNATURE OF OFFICER IN CHARGE	RANK

BALLAST WATER HANDLING LOG

Narrative record of events related to ballast water management on board

Ship ..... Port of Registry .... IMO number .....

Record here events which are relevant to ballast management, and which will be of interest to quarantine officers, such as sediment removal during dry-dock, or tank flushing at sea. Each entry should be completed with the signature and rank of the officer making the entry.

Date	Activity	Comments

Annexure 4.3: Specifications of Asbestos Dismantling Enclosure

Asbestos handling enclosures will be set up on board the ships as well as on the plots. The enclosures will be prepared with:

1. HDPE / leak-proof sheets as material of construction.
2. Negative air-pressure inside so that asbestos laden air does not leak out.
3. High Efficiency Particulate Air(HEPA) filters at the inlet as well as the exhaust of enclosure.
4. Two – Three door entry and exit plans.
5. Wash / bathing / shower facility at the final exit door to avoid contamination being carried out of the work place.
6. The minimum air exchange rates required for the employees to work within. (For 260 sq. feet working area, air exchange rate of >15 is to be maintained for good working of >5 persons).
7. Leak detection tests / air quality testing equipment.
8. Have arrangements for water sprinkling to wet the asbestos.

ANALYSIS OF ALTERNATIVES

5.0 ANALYSIS OF ALTERNATIVES

5.1 INTRODUCTION

Ship breaking can be carried out by several methods, which include beaching, berthing, dry-docking and lifting on to dry land by marine air bags or over a slip-way.

The method followed at the different ship breaking sites depends on availability (or non - availability) of infrastructure, geographical features (tidal range, sea currents, climate, nature of soil etc.), prevailing environmental and other legislation, skill of the available work force and economics of the operation.

5.2 METHODS OF SHIP BREAKING

5.2.1 Beaching Method

Beaching is the most common method and is widely used in most places in India, Bangladesh and Pakistan. In the beaching method, the ships are grounded in the inter-tidal zone, either under their own power or under tow, during spring tides (i.e. beached). This method requires minimum infrastructure and level of skill of the workers involved. The only infrastructure required are shore based winches, crawler cranes and other material handling equipment. The size of the ship to be cut is restrained only by the tidal range of the beach, its slope (a flat beach is suitable) and material of the beach (a beach made up of rocks or coarse sand poses problems).

After receiving statutory clearances, removal items, such as insulation, machinery, tools & tackle, electrical fixtures, furniture, fuel oil etc. (refer Table 2.4) are removed. The ships are cut into large pieces, which are dropped on the beach. These pieces, some weighing hundreds of tonnes, are either winched to the shore by shore based winches or carried by crawler cranes to dry land and cut up completely. As the ship is cut up the remnants (i.e. the partly cut ship) is dragged closer to the shore by shore based winches to facilitate material handling.

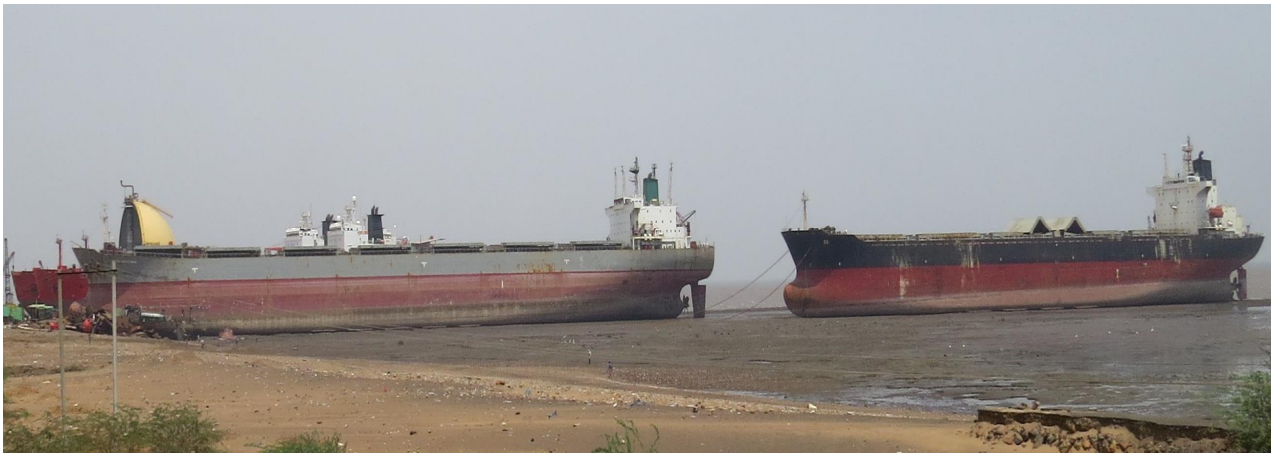


Photo 5.a: Ships Beached at Alang for Recycling (April, 2015)

Photo 5.b: 31 Year Old Container Ship being Beached at Alang (April, 2015)

Photo 5.c: Ship-breaking by Beaching Method at Alang

5.2.2 Berthing Method

Ships are also broken while berthed along quays (as is done at Khidderpur Docks, Kolkata). The ships are tied up along side a quay and cut up while still afloat. After removal of detachable items / material, the ship is cut using oxygen-LPG or oxygen-acetylene torches. Pieces weighing not more than ~5 t are cut and lowered on to the quay by shore based or ship-board cranes. The cutting should be carefully planned so that the floating ship does not become unbalanced and capsizes or sags or hogs. The bottom of the hull is winched on to dry land (beached) for final demolition.

This method requires availability of a quay, facilities for berthing the ship and shore based cranes and other material handling equipment. The size of the ship to be cut is restrained only by quay length and navigational restrictions, if any, for reaching the quay. Also land and infrastructure must be available for beaching the hull bottom.

Compared to the beaching method of ship-breaking the berthing method is more environment friendly. Most of the debris generated on board the ship can be collected and taken ashore for proper disposal. There is little chance of water entering exposed interiors of the ship and carrying away contaminants. Some debris does fall into the water. Ship-board effluents can be easily pumped to shore based treatment systems. If the quay is inside an enclosed dock (e.g. as in Khidderpur dock), floating booms can encircle the ship which will enable collection of any falling floating debris or spilled oil; contaminated sediments can also be dredged up and disposed off properly on shore.

Since the ship is berthed along a quay, arrangements for working even at night can be easily made. Materials removed form ships need to be transported only short distances over proper roads to material storage and sorting areas which improves efficiency and consumes less fuel (for transport vehicles). Casualty evacuation will take minimum time.

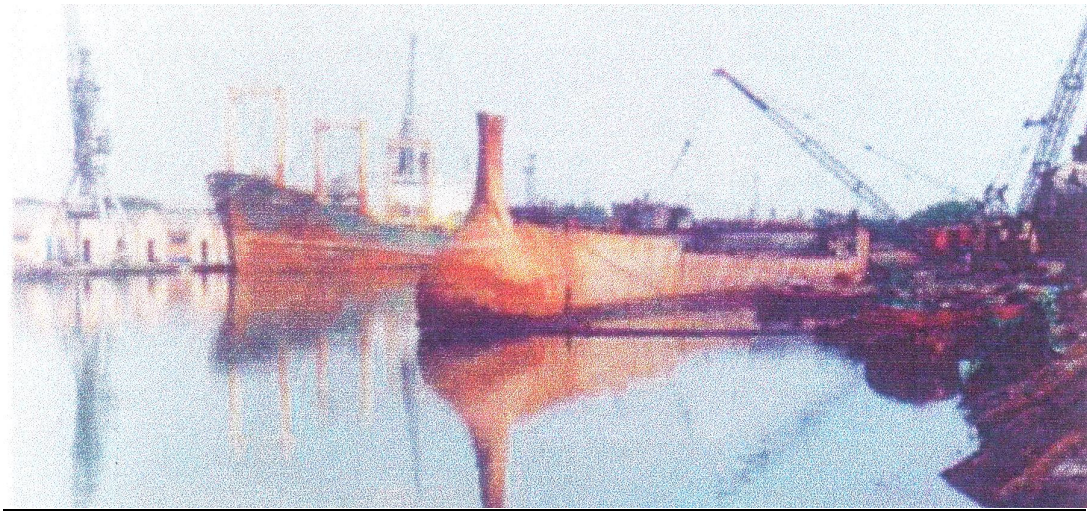


Photo 5.d: Ship-breaking at Khidderpur Dock, Kolkata by Berthing. Ship on the right partly broken up, the one on the left waits its turn

5.2.3 Dry-docking Method

Ships are also broken up inside dry-docks (either graving docks or floating docks). The ship is moved inside a graving dock or a submerged floating dock and properly positioned. In case of a graving dock, the dock gates are closed and the water is pumped out. In case of a floating dock, the dock is raised, lifting the ship out of the water. Subsequently the ship is cut up as usual. In this method also round the clock working is possible.

This method requires a lot of infrastructure in form of the dock and associated infrastructure and equipment. The size of the ship is also restricted by the dimensions of the dock. On the other hand this method is most environment friendly as all spillages are confined inside the dock and the spilled material can be easily collected, sorted if necessary and disposed off properly. However, it is more economical to use dry-docks for building and repairing ships rather than breaking ships. Dry-dock method of ship

breaking is used only in special cases (such as nuclear powered ships, ships containing toxic residues) or if enforced by law.

Photo 5.e: Scrapping of Naval Ship in Dry-Dock

5.2.4 Air Bag Method

In the Air-Bag Method, the ship is winched onto dry land over a slipway made up of inflatable rubber bags. Once on dry land the ship is settled over a line of keel-blocks and the air bags are removed. The ship is subsequently cut up in the usual way.

This method requires considerable infrastructure (though not on the scale of dry docks) and highly skilled personnel for winching the ships on to dry land.

The biggest advantage of this method of ship breaking is that chances of water pollution are greatly reduced as all activities take place on dry land. Fallen debris and contaminated soil of the beach can be easily collected, sorted and disposed off properly. There is virtually no chance of tidal waters entering exposed areas of the ship and carrying away solid residues and oil. Ship-board effluents can be easily pumped out to shore based treatment and or / disposal systems. It is relatively much easier to contain and collect spilled oil and other effluents during pumping operations. Like other methods of ship breaking close to / on dry land, round the clock working and higher efficiency is attained.

Photo 5.f: Decommissioned Submarine Being Raised on to Dry Land over Air Bags for Scrapping

5.2.5 Slip-way Method

In the slip-way method also, the ship is winched on to dry land over a concrete / masonry slipway and cut up on dry land. This method is similar to that of the Air Bag method, except that instead of a slip made of air bags, the ship is winched onto dry land over a concrete slip way.

The relative merits / demerits of the different ship breaking methods are given in **Table 5.1**.

Table 5.1: Relative Merits / Demerits of Different Ship Recycling Methods

Attribute	Beaching Method	Dry Docking Method	Berthing Method	Air Bag Method	Slip-way Method
Size of Ship	Restricted only by tidal range at site	Restricted by dimensions and specifications of dry dock	Restricted by navigational constraints & quay length.	Restricted by load bearing capacity of air bags.	Restricted
Infrastructure Requirement	Minimum. Only mechanical material handling eqpt. reqd.	Dry dock and mechanical material handling eqpt. reqd.	Quay & mechanical handling eqpt. reqd. Land for beaching also reqd.	Winches, air bags, air compressors, keel blocks & mechanical handling eqpt. reqd.	Civil infrastructure, winches & mechanical handling eqpt. reqd.
Working efficiency	Low as mobile machinery have to be withdrawn during high tides. Working during day time only. Recovered materials have to carried / winched across hundreds of m of inter-tidal zone	Round the clock working possible. Material sorting and storage areas may be located close by.	Round the clock working possible. Material sorting and storage areas may be located close by.	Round the clock working possible. Material sorting and storage areas may be located close by.	Round the clock working possible. Material sorting and storage areas may be located close by.
Time required	Fast	Fast but less than that for beaching	Slow	Fast	Fast
Effect of stormy weather	Rough seas may restrict deployment of men and machines and increase pollution	No effect	May have some effect	No effect	No effect
Pollution Potential	Maximum	Minimum	May be high but can be controlled to some extent	Low	Low
Time for casualty evacuation	Has to wait till low tide	Minimum delay	Minimum delay	Minimum delay	Minimum delay

5.2.6 Selected Method

At Alang the beaching method is followed. The reasons for selecting the same are:

1. High Tidal Range (<10 m) which enables beaching of very large ships including ULCCs and Cape Size Vessels
2. Suitable strata over a continuous long stretch of beach
3. Relatively calm water

5.3 SITES FOR DECONTAMINATION FACILITIES

It has been mentioned in Chapter 2, that it is proposed to set up Ship Decontamination Facilities (Dry Docks) as part of the up-gradation programme. Initially one dry dock had been proposed but subsequently it was proposed to set up two dry docks.

For Dry Dock 1, two potential sites were examined:

1. Site A: At the northern end of the existing yard at latitude 21°24'36.25"N and longitude 72°11' 46.74"E
2. Site B: At the southern end of the existing yard at latitude 21°22'33.39"N and longitude 72°09' 59.78"E.

At both these sites there is rocky shelf, where ships cannot be beached and winched towards the shore. The present extent of the ship recycling yard is limited by these two rocky shelves.

Site A is located at the northern end of Alang Ship Recycle Area, located at the mouth of River Manari where generally no currents were observed. The location is well located where the dock itself would not be an obstacle of the beaching conducted by the adjacent recyclers. Sheet Piling around the site and land filling is required. The average distance between 0 m contour to +5 m contour is approx. 1.0 km. Beyond 0 m contour the depth increases suddenly. The beach slope is approx. 1:200. Beyond +5 m contour, the shore is steep rising to +10 m contour. This may be due to presence of sand dunes.

Site B is located at the southern end of Alang Ship Recycle Area. The location was proposed by GMB. At the Lowest Tide, sandy soft rock exposed all over the beach. No water edge was seen. From the proposed Dry Dock site a huge table of rock and several rock head were observed at 1,000m off the shore. The distance between 0 m and +5 m contour is approximately 1.5 km. Beyond 0 m contour, sea bed slope is somewhat flatter and the shore side slope is 1:300. Beyond + 5m contour, the shoreline rises to +8/10 m. This may be because of sand dunes.

The advantages and disadvantages of the two sites are as follows:

Table 5.2: Comparison Between Two Possible Dry Dock Sites

	Site A	Site B
Advantages	(i) 10 m contour near shore (ii) Not prone to wave actions (iii) Small Dredging Required (iv) Cost effective	(i) Not prone to wave actions due to the presence of Sultanpur / Gopnath shoals (ii) Not prone to siltation (iii) Less maintenance dredging (iv) The shoreline is wider and flatter
Disadvantages	(i) Site in the vicinity of River Manari (ii) Any structure in the river mouth itself is vulnerable location to flood/ erosion/siltation and obstructing the natural flow during monsoon	(v) Considerable Capital Dredging Required

However, it is understood that with merger and allotment of bigger plots, number of working plots will be limited. Hence, GMB is keen to work on exploring ways to increase the ship breaking area. It is observed that the extension towards Sosiya in North is not possible as Nuclear Power Corporation of India Ltd. (NPCIL) is proposing to set up a Nuclear Power Plant at Mithivirdi Village, which is about 8 - 10 Km north of Sosiya in adjacent Jaspara Taluka (of Bhavnagar District). This follows that there cannot be any industrial establishment/development within the 5 km radius of sterilised zone. This development restricts the expansion of recycling yards towards Sosiya.

Thus, siting of more plots towards south of Alang is the only feasible option. Therefore it has been decided to set up Dry-dock - 1 at the southern end of the existing ship-recycling yard.

Photo 5.g: Site Selected for Dry-dock 1 (As in April, 2015)

About 2 km south of the existing Alang-Sosiya Ship Recycling Yard, there is another rocky shelf, where ships cannot be grounded. It has been decided to set up the 2nd dry dock at this location (21°21'43.87"N and longitude 72°09'19.79"E).

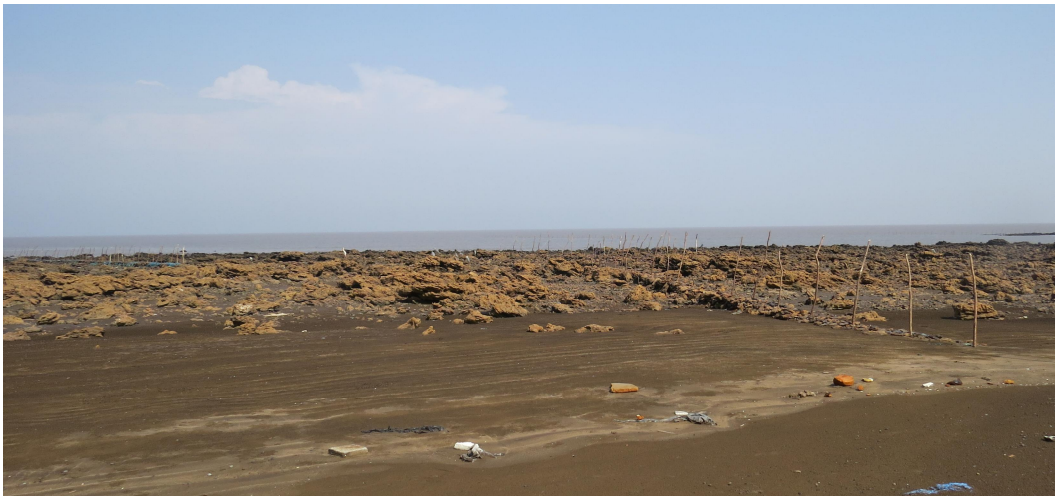


Photo 5.h: Site Selected for Dry-dock 2 (as in April, 2015)

The space between the two dry-dock sites is suitable for beaching and winching of ships. It has been decided to set up 15 additional ship-recycling plots, each of ~100 m width in this intervening area to optimize the use of land resources. These modern plots will by suitable for high level of mechanization and have proper waste collection & storage facilities and environmental management systems from inception itself.

Photo 5.i: Proposed Expansion Area between the Dry-docks (As in April, 2015)

ENVIRONMENTAL MONITORING PROGRAMME

6.0 ENVIRONMENTAL MONITORING PROGRAMME

6.1 INTRODUCTION

The monitoring and evaluation of the management measures envisaged are critical activities in implementation of the proposed project. Monitoring involves periodic checking to ascertain whether activities are performed according to the plan. This provides necessary feedback for project management to keep the program on schedule. The purpose of the environmental monitoring plan is to ensure that the envisaged purpose of the project is achieved and accrues desired benefit.

To ensure the effective implementation of the proposed mitigation measures, the broad objectives of monitoring plan are:

- To evaluate the performance of mitigation measures proposed in the EMP.
- To evaluate the adequacy of Environmental Impact Assessment
- To suggest improvements in environmental management plan, if required
- To enhance environmental quality.
- To implement and manage the mitigation measures defined in EMP.
- To undertake compliance monitoring of the proposed project operation and evaluation of mitigation measure.

GMB has a separate "Environment Cell" to co-ordinate day to day environmental monitoring/ inspection requirements at all installations under GMB's jurisdiction, including Alang-Sosiya Ship Recycling Yard. At GMB's Alang Office there is a dedicated team of ten Safety Officers and Safety Supervisors to look after Health Safety and Environment (HSE) related issues at present. Vacancies for another five Safety Officers and Safety Supervisors are being filled.

6.2 ENVIRONMENTAL ATTRIBUTES TO BE MONITORED

6.2.1 General

Several measures have been proposed in the environmental mitigation measures for mitigation of adverse environmental impacts. These shall be implemented as per proposal and monitored regularly to ensure compliance to environmental regulation and also to maintain a healthy environmental condition around the ship recycling facility.

Major part of the sampling and measurement activity shall be concerned with long term monitoring aimed at providing an early warning of any undesirable changes or trends in natural environment that could be associated with the ship recycling and allied activities. It is essential to determine whether the changes are in response to a cycle of climatic conditions or are due to impact of ship recycling and allied activities. In particular, a monitoring strategy shall be chalked out to ensure that all environmental resources, which may be subjected to contamination, are kept under review and hence monitoring of the individual elements of the environment shall be carried out. During the operational phase, Environment Cell of GMB in association with the Ship Recycling

Industries Association (India) {SRIA} shall undertake all the monitoring work to ensure the effectiveness of environmental mitigation measures. The suggestions given in the Environmental Monitoring Programme shall be implemented by GMB and individual plot holders by following an implementation schedule.

In case of any alarming variation in ground level concentration of pollutants in ambient air, work zone air, noise, sea water & sediments, performance of settling pits, condition of garland drains, retaining bund, etc. shall be discussed by GMB with the concerned project authorities (on a monthly basis). Any variance from norms will be reported for immediate rectification action at higher management level.

The environmental attributes to be monitored to ensure proper implementation and effectiveness of various mitigation measures envisaged / adopted during operation of the proposed project are described here under.

6.2.2 Meteorology and Waves & Water Currents

It is necessary to monitor the meteorological parameters regularly for assessment and interpretation of air quality data. Continuous monitoring will also help in emergency planning and disaster management. The ship recycling yard shall have a dedicated automatic weather monitoring station. It is suggested that this weather monitoring station be set up at Alang Fire Station which is centrally located. The following data shall be recorded and archived:

- Wind speed and direction
- Rainfall
- Temperature and humidity
- Solar Radiation

Similarly, it is necessary to monitor waves and currents regularly for assessment of sea water quality data. Continuous monitoring will also help in emergency planning and disaster management. Wave heights and periodicity and water current speed & direction will be monitored.

6.2.3 Ambient Air Quality

Ambient air quality shall be monitored once a month at 6 (six) locations in accordance with CPCB / GPCB guidelines. The parameters which shall be monitored are Particulate Matter, SO_2, NOx and CO. The frequency of monitoring shall be in accordance with GPCB guidelines / directives.

6.2.4 Work Zone Air Quality

Work zone air quality in the ship recycling facility shall be monitored at one location on each of the smaller plots, two locations on each of the 90 / 100 m wide plots, two locations at each of the dry-docks and at two locations at the TSDF to assess the levels of particulate matters, CO, NO_X and SO_2 in the work zone. Asbestos fibre content in work

zone air will be monitored when asbestos and / or asbestos containing material is being handled. The asbestos content will be determined by the membrane filter method at 4000 – 450X magnification (4 mm objective) phase contrast illumination as specified in The Indian Factories Act. The frequency of monitoring shall be in accordance with GPCB guidelines / directives.

6.2.5 Water and Sediment Quality

Sea water quality at varying distances and directions from the ship recycling facility will be monitored at regular intervals as per GPCB / CPCB directives. Care will be taken to measure oil & grease and heavy metals (especially Lead, Chromium, Copper and Tin) content of the water. In case of any adverse trend, which may be attributable to the ship-recycling facility (e.g. oil & grease content) is noticed, immediate remedial measures shall be taken.

Along with water samples, sediment samples will be collected for chemical analysis. The hydro-carbon and heavy metal contents of all samples will be determined. Once a quarter the PCB content of the sediment samples will also be determined.

6.2.6 Effluent Quality

Although India has not ratified the Ballast Water Management (BWM) convention, GPCB insists that ballast water on board must be exchanged as per the BWM Convention prior to beaching. GPCB scrutinises the relevant paper-work as part of the pre-beaching process. The same shall be continued. GPCB also ensures that oily water remaining on board is treated so that the oil content is reduced to less than 15 mg/l in the undiluted effluent. Nevertheless, all ships effluents are monitored prior to discharge. After a ship has been beached, as part of the "Decontamination" Process, which is mandatory for grant of Cutting Permission, bilge water present on board is pumped out into road tankers and transported to the ETP at Alang TSDF for treatment. The effluent is analysed before treatment as well as after treatment. It is determined whether the effluent quality meets the standards specified in Schedule VI of The Environment (Protection) Rules, 1986; in case of oil & grease, the maximum allowable concentration shall be 15 mg/l in accordance with MARPOL. The Slops remaining on board and other effluents generated subsequently (e.g. fuel tank washings) are also dealt with similarly.

6.2.7 Solid Wastes

Solid wastes are segregated as hazardous, non-hazardous, combustible or non-combustible depending on their nature or origin at the plots and packed in labelled bags. The packed bags with necessary paper-work recording the nature and quantity of wastes are then trucked to the TSDF for disposal.

6.2.8 Noise

GMB shall arrange to monitor ambient noise levels at eight locations all along the outer periphery of the ship recycling yard once in a month.

Noise levels shall be monitored at the source of generation in ship recycling facility. The plot operators shall keep a record of noise levels and take necessary organizational actions like rotation of workmen, availability and use of personal protective devices etc.

6.2.9 Occupational Safety and Health

All workers undergo a pre-employment medical examination. They also undergo subsequent medical examination. The medical examination is carried out by a qualified occupational health physician. The cost of medical examination is borne by SRIA. A systematic programme for medical check-up at regular intervals shall be followed for all workers to ascertain any changes in health condition due to the working conditions. In addition, workers engaged in asbestos removal work will undergo pre-employment and periodical medical examinations at regular intervals to ascertain whether they are medically fit to don the prescribed respirators.

6.2.10 Maintenance of Drainage System

The effectiveness of the drainage system depends on proper cleaning of all garland drains/catch drains. The garland drains around the ship cutting area shall be regularly checked and cleaned to ensure their effectiveness. This maintenance shall be rigorous during the monsoon season.

6.2.11 Green Belt Development & Plantation

Green belt development and plantation in and around the ship-recycling facility shall continue to improve the green cover in the area. The data on area of green cover, survival rate etc shall be compiled for periodic review. The following plan shall also be made for future program:

- Annual plans for tree plantation with specific number of trees to be planted shall be made. The fulfillment of the plan will be monitored by GMB's Environment Cell and Ship Recyclers Association of India (SRAI) every three months.
- A plan for post plantation care will be reviewed in every meeting. Any abnormal death rate of planted trees shall be investigated.
- Watering of the plants, manuring, weeding, hoeing will be carried out for minimum 3 years.

6.2.12 Socio-Economic Development

GMB's successful CSR activities have played a significant role in the peripheral development of areas, where its existing projects are located. The proposed upgradation-cum-expansion project will contribute further towards improvement of the existing infra-structure & economic conditions in Alang-Sosiya area leading to overall socio economic development of the region. The communities, which are likely to be benefited by the proposed project, are thus one of the key stakeholders for the project. GMB have planned structured interactions with the community to disseminate the

measures taken by GMB and also to elicit suggestions for overall improvement for the development of the area.

6.3 PLANNING OF MONITORING

6.3.1 General

The target for the ED for implementing the environmental monitoring plan on a short-term basis would be to:

1. Interpret requirements of the EIA documentation into an environmental education plan;
2. Assist engineering team with the incorporation of EMP requirements in contract specifications and contract terms and conditions;
3. Undertake and/or co-ordinate all internal compliance monitoring and evaluation and external monitoring through suitable outside consulting firm;
4. Advice the management on all matters related to environmental requirements of the project;
5. Provide all necessary specialized environmental expertise as needed during the project period.

The long-term objective of ED would be to build environmental awareness and support, both within and outside the ship recycling facility. The other long-term tasks would be to develop environmental training programme for the target groups of different disciplines of the ship-recycling facility.

The environmental monitoring plan contains:

- Performance indicators
- Environmental monitoring programme
- Progress of Monitoring and Reporting Arrangements
- Budgetary provisions
- Procurement Schedules

6.3.2 Performance Indicators

The physical, biological and social components identified to be particularly significant in affecting the environment at critical locations have been suggested as Performance Indicators (PIs). The performance indicators will be evaluated under two heads:

a) Environmental condition indicators to determine efficiency of environmental management measures in control of air, noise and water pollution and solid waste disposal.
b) Environmental management indicators to determine compliance with the suggested environmental management measures.

The Performance Indicators and monitoring plans will be prepared for the project for effective monitoring.

6.3.3 Environmental Monitoring Programme

The Environmental Monitoring Plan during the operational phase of the project, for each of the environmental condition indicator is given in **Table 6.1**.

The monitoring plan specifies:

- Parameters to be monitored
- Location of the monitoring sites
- Mitigation measures & cost
- Applicable standards
- Institutional responsibilities for implementation and supervision

Table 6.1: - Environmental Monitoring Programme

Environmental Issue/ Impacts	Mitigation Measure	Frequency of sampling / monitoring	Approximate Location	Implementation Responsibility
1. Meteorology & Physical Oceanographic attributes	Through a continuously monitoring system.	Continuous	Meteorology at Fire Station. Physical oceanographic attributes at different locations	EC
2. Ambient Air Quality	Ambient Air Quality with respect to RPM, SO_2, and NOx shall be monitored.	Once in a Month	1 control station in upwind side and 7 stations in and around the project site.	EC
3. Work zone Air Quality	Work zone Air Quality with respect to RPM, Asbestos fibres, SO_2, NOx shall be monitored	Once in a Month	Asbestos at asbestos handling areas. Other parameters at representative locations.	Individual plot owners.
4. Ambient Noise	Periodic measurement with Noise meter	Once in a Quarter	At nearby settlements and alongside the road	EC
5. Work zone Noise levels	Periodic measurement with Noise meter	Once in a Quarter	At representative locations.	Individual plot owners.
6. Surface Water and sediment Quality	Changes in surface water and sediment quality will be monitored by water and sediment analysis.	Once in a Quarter	At varying distances and directions in sea depending on current	EC
7. Effluent quality	Quality of effluents being discharged will be monitored to prevent water pollution	As and when water is discharged from ships	At outfalls	EC
8. Solid Waste generation.	Solid wastes will be segregated and dumped in secured land fill.	Daily inspection	At material sorting and storage areas	EC , Individual plot owners.
9. Maintenance of Storm Water Drainage System	The drains will be periodically cleared to maintain storm water flow.	As per requirement before and during monsoon	Drainage network within the plot areas.	Individual plot owners.
10.Green Belt	Green belt development	Once in a quarter	Plantation areas	EC / SRIA
11.Occupational Health	Health check up, Training	All workers under medical checkup every year.	Ship dismantling area, material sorting and handling areas.	SRIA
12.Socio-economic Development	Structured interactions with the community	Once every six months	Stake Holders	EC, SRIA

Note: EMP = Environmental Management Plan, EC = Environmental Cell of GMB; RPM = Respirable particulate matter; SO_2 = Sulphur di-oxide; NO_X = nitrogen oxides; SRIA = Ship Recycling Industries Association (India).

6.3.4 Progress Monitoring and Reporting Arrangements

The rational for a reporting system is based on accountability to ensure that the measures proposed as part of the Environmental Monitoring Plan get implemented in the project. The monitoring and evaluation of the management measures are critical activities in implementation of the project. Monitoring involves periodic checking to ascertain whether activities are going according to the plans. It provides the necessary feedback for the project management to keep the programme on schedule. The rational for a reporting system is based on accountability to ensure that the measures proposed as part of Environmental Management Plan get implemented in the project. Important reports to be maintained for environmental monitoring plan are given in **Table 6.2.**

Table 6.2: Important reports to be maintained for Environmental Monitoring Plan

Sl. No.	Particulars
1.	Field monitoring results for air, water, noise, meteorology & physical oceanographic attributes
2.	Inspection records of solid wastes, drainage, socioeconomic development
3.	Format to record /monitor plantation measures
4.	Environmental and related standards/norms
5.	Records pertaining to statutory consents, approvals
6.	Code of actions for pollution control in defined areas
7.	Records of medical examination of workers
8.	Complain register (environmental pollution)
9.	Records on water and electricity consumption
10.	Periodic progress records
11.	Environmental audit records
12.	Records of annual budgetary requirement and allocation for pollution control

6.3.5 Emergency Procedures

Suitable emergency procedures have been / will be formulated and implemented during operations tackling of emergency situations arising out of the proposed operations. Procedures for the following emergency situations shall be formulated:

- Equipment failure during beaching / winching of ships
- Equipment failure during dry-docking / undocking of ships
- Fire
- Spillage of hazardous wastes
- Accidents during regular operations
- Possible danger due to storage of compressed gases (LPG, Liquid Oxygen, refrigerants)
- Possible danger due to spillage of fuel oil, lubricating oils

- Natural disasters (cyclone, earthquakes, tsunami)

6.3.6 Budgetary Provisions for Environmental Monitoring Plan

The orders of costs are presented under various headings in **Table 6.3**.

Table 6.3: Cost of Existing Environmental Protection Measures (in Rs. Lakh)

Sl. No.		Capital cost
1	**Pollution Control**	
	A. Water Pollution Control	
	Effluent Treatment & Disposal	22
	B. Air Pollution Control	
	Air Pollution control	Included in Total Project Costs
	C. Solid Waste Management	
	Solid waste Land-fill	617
	Incinerator	350
2	**Occupational Safety & Health**	1000
3	**Green Belt**	5
Total		**1994**

In addition to above Capital Costs, Rs. 3 Lakhs is spent annually towards pollution monitoring and environmental auditing, another Rs. 24 lakhs is spent towards CSR activities. Rs. 1 lakh is spent annually towards tree plantation in the Notified Area.

The proposed upgradation project envisages improvement of the yard and waste collection & disposal systems. The project costs given in **Table 6.4**.

Table 6.4: Cost of Proposed Environmental Measures

Sl. No.	Description	Capital Cost (Crores of Rs.)	O & M Cost (Crores of Rs.)
1.	Ship Recycling Yard Improvement including labour welfare infrastructure	470.756	8.303 to 9.571
2.	Hazardous material removal pre-treatment facility as Dry Docks	490.680	1.521 to 4.057
3	Oil Recovery/ Oily Water Treatment Facility	175.258	2.155 to 4.437

Costs estimated in million US $ in DPR. Exchange rate of Rs. 63.384344 per US $ considered (rate prevailing on 15th July, 2015)

6.4 LABORATORY FACILITIES AND EQUIPMENT

GMB arranges for accredited laboratories for undertaking environmental monitoring as and when required. However the environmental monitoring of the TSDF is carried out by the TSDF's own quality control laboratory.

GMB is planning to enter into an agreement with Central Salt and Marine Chemicals Research Institute (CSMCRI), Bhavnagar, (a CSIR laboratory) for undertaking regular

environmental monitoring in and around Alang-Sosiya SRY. GMB is also contemplating to augment the resources of the TSDF's quality control laboratory to carry out regular environmental monitoring for the entire yard.

6.5 UPDATING OF EMP

The directives from GPCB, CPCB, MoEF&CC and the regulations in force at any time shall govern the periodicity of monitoring. However it is suggested that the implementation of various measures recommended in the Environmental Monitoring Programme be taken as EMPs in the ISO –14001:2000 system to effectively implement the measures for continual improvement in environmental performance. OHSAS 18001 will be implemented at all the plots and common facilities (Dry-docks and TSDF) in phases.

ADDITIONAL STUDIES

7.0 ADDITIONAL STUDIES

7.1 PUBLIC CONSULTATION

7.1.1 During Field Study

Peoples' perception regarding the project is a very important factor because it is the people on whom the major part of the impact will occur. To this end, an opinion poll was conducted as a part of field survey. The results of this poll are furnished in **Table 7.1**.

Table 7.1: Peoples' Perception Regarding the Project

Sl.No.	Perception	No of respondents
A	**ADVANTAGES**	
1.	Employment opportunity	22 (84.62)
2.	Business opportunity	2 (7.69)
3.	Increased value of land	1 (3.85)
B.	**DISADVANTAGES**	
1.	Pollution	6 (23.08)
2	Increased accidents	6 (23.08)
Figures in ( ) indicate % in total number of respondents		

It is observed that about 85% of the respondents are optimistic about the expansion project because of increased employment opportunities. About 8% expect increased business opportunities. About 4 % of them expect the value of their land to increase. So far disadvantages are concerned, about 23% of the respondents are worried about the problem of increase in pollution and damage to the environment. ~23% are afraid of increase in accidents in the project.

GMB has already implemented several general measures for the socio economic upliftment of the nearby villagers, under its Corporate Social Responsibility (CSR) programme. GMB sponsors celebration of various festivals, cultural programmes and sports activities for workers' entertainment. GMB provides distributes school books, stationary, bags and uniforms amongst school going children of workers employed at the SRY. GMB organizes free medical camps for workers and villagers in and around Alang. Rs.24,00,000/- (Rupees Twenty-four lakhs) has been sanctioned for CSR activities for the year 2015 – 16, whose details are given in **Table 7.2**. This amount is likely to be revised in all subsequent years in consultation with local villagers.

Table 7.2: CSR Budget for Alang during 2015 – 16

Sl. No.	Month	Head	Sanctioned Amount (Rs.)
1	May,'15	Celebration of World Labour Day	50,000
2	August,'15	Celebration of Independence Day	50,000
3	Sept.,'15	Sports for Workers' Children	50,000
4	Oct.'15	Celebration of Gandhi Jayanti and Musical Evening	50,000
5	Nov.'15	Celebration of Children's Day	50,000
6	Dec.,'15	Cricket Tournament for Yard Workers	50,000

Sl. No.	Month	Head	Sanctioned Amount (Rs.)
7	Dec.,'15	Cultural Programme on New Year's Eve	75,000
8	Jan.,'16	Celebration of Kite Festival	25,000
9	Jan.,'16	Celebration of Republic Day	50,000
10	Feb.,'16	Celebration of Alang Day	25,000
11	Feb.,'16	Picnic for workers' children	25,000
12	March,'16	Safety Week Celebration	100,000
13	April,'15 – March, `16	Medical Camp for local villagers	12,00,000
14	April,'15 – March, `16	Distribution of books, copies, stationary, school bags, uniforms, socks & shoes amongst approx. 500 workers' children	6,00,000
		TOTAL	24,00,000

7.1.2 During Environmental Public Hearing

The public consultation for the project was held on 20-10-15 at Gujarat Maritime Board's Training & Welfare Complex, Alang Village, Tal. Talaja; Dist. Bhavnagar. The notices for the public consultation had been published in "Western Times", Ahmedabad edition dated 19-09-2015 (English) and in "Sandesh" (સંદેશ), Bhavnagar edition dated 19-09-2015 (Gujrati). The notice of the public consultation had also been posted on Gujarat Pollution Control Board's website. Copies of EIA Report and the Executive Summary (in English and Gujarati) were also sent to following authorities / offices to make them available for inspection to the public during normal office hours, till the public hearing was over:

- Office of the District Collector, Bhavnagar District
- District Development Office, Bhavnagar
- District Industry Centre, Bhavnagar
- Taluka Development Office, Talaja
- Office of the Chief Conservator of Forests, Ministry of Environment, Forest and Climate Change, Govt. of India, Regional Office (West Zone), Bhopal
- Regional Office of Gujarat Pollution Control Board, Bhavnagar

The public consultation process was supervised and presided over by Shri B. Pani, I.A.S., Collector, Bhavnagar. He was assisted by Shri R.R. Vyas, Regional Officer, GPCB, Bhavnagar who was the representative of The Member Secretary, GPCB (see **Photo 7.a**). Shri Vyas also acted as the Member Secretary of the Public Hearing Committee.

Photo 7.a: Shri B. Pani (on right) Presiding over the Public Consultation

The public consultation was attended by 69 members of the public.

An audio-visual presentation was made by GMB giving the introduction about the project, its technical details, impacts of the project and measures to mitigate the likely adverse impacts, the proposed environment monitoring & management system and Corporate Social Responsibility (CSR) activities undertaken by GMB in nearby villages. The forum was kept open for the public to raise any issue / suggestion / objection, if any. A series of issues were raised both orally as well as in writing.

19 (Nineteen) questions were raised by 8 (eight) different members of the public belonging to the study area. A total of 12 (twelve) written representations were submitted by individual members of the public, associations and Non-Government Organizations (NGOs).

The querries covered pollution from ship-recycling and allied activities, provision of health care facilities and other amenities for workers, management of additional effluents & hazardous wastes expected to be generated from the expanded ship-recycling yard, sewage management from the workers' colony, economic viability of the upgradation & expansion project, employment generation (numbers and type of jobs), the status of the additional land earmarked for the upgradation & expansion project, source of water for the project, baseline environmental data generated for the EIA Report, CSR activities to be undertaken in the area, green belt development, clearance status of the TSDF site, emergency preparedness, possibility of destruction of mangroves, etc. Clarifications were sought on status of regulatory clearances, technical details of the project, technicalities of the baseline environmental data included in the EIA Report, responsibility for implementation of pollution control measures, status of accreditation of the consultant who had prepared the

EIA/EMP Report (M/s MECON Ltd.) and the contents & structure of the EIA Report etc. Some submissions (both oral as well as written) were made for inclusion of some additional villages within Alang Notified Area.

The answers to the oral questions were furnished by GMB's representatives on the spot. As regards the written submissions, GMB submitted written replies which were sent directly to the respective persons / organizations by post, with a copy to GPCB.

GMB informed that baseline environmental conditions have been monitored by Central Salt and Marine Chemicals Research Institute and other institutes for the past 15 years and the results do not indicate pollution of ground water or damage to agriculture. GMB informed that a hospital with tertiary care facilities (including burns ward, trauma care etc.) for workers was coming up at Alang as part of the ongoing programme; Primary Health Centre will also be developed for workers. GMB explained that the upgradation project was necessary in order to adhere to international treaties / regulations and also to allow ships owners from OECD countries, who are presently constrained by their respective national regulations, to send their ships to Alang. GMB expects that the project will completed over the next 7 – 8 years and enable Alang to regain its market share by then. GMB informed that the upgradation project would come up only on GMB's land. GMB informed that the TSDF has received all necessary clearances from the concerned statutory authorities. All solid and liquid wastes will be collected and dispatched to this TSDF as is already being practised. As regards employment, GMB said that about 40000 to 50000 skilled and semi-skilled workers , not only from Gujarat but also from other states of the country would be directly employed at the project after being trained at GMB's Safety Training Institute at Alang. It is expected that 1.5 – 2 lakh people will get indirect employment. GMB informed that Rs. 150 Crores had been earmarked for improvement in safety and development of housing, health-care and other social amenities for workers. Clarifications on status of regulatory clearances, technical details of the project, technicalities of the baseline environmental data included in the EIA Report, responsibility for implementation of pollution control measures were provided to the members of the public both on the spot as well as in writing. GMB also said that the Draft EIA Report may be suitably modified would be made to address the issues raised by the public. As regards, inclusion of additional villages within Alang Notified Area, the Chairman of the Public Hearing Committee ruled that the matter was a revenue matter and outside the purview of the Environmental Public hearing. As regards Accreditation Status of the EIA Consultant (M/S MECON Ltd.), GMB informed that they had been informed MECON had not been issued any fresh accreditation certificate; they had only received a letter from NABET stating that their accreditation had been extended up to 2017. To prove that M/s MECON Ltd.'s accreditation to carry out EIA Studies for Ship Recycling Yards was valid, copy of the latest list of

approved EIA Consultants for different sectors as published by Ministry of Environment Forest and Climate Change on website, wherein MECON's name appears, was provided. GMB also stated that MECON had prepared the EIA Report as per the Ministry's guidelines.

Proceedings of the Environmental Public Consultation have been enclosed as **Appendix**. The proceedings also include the querries (oral and written) in Gujrati, their English translations and the replies both in Gujrati along with English translations.

7.2 SOCIAL IMPACT ASSESSMENT

As discussed in Chapter 3 (under clause 3.6) a socio-economic survey was undertaken in the study a rea. Survey was conducted on Composition and size of family, educational status, homestead, information on agricultural situation (holding size, Land use, cropping pattern, productivity, net return etc.), employment (sources of employment), income (income from various sources, information on family budget, Consumption and saving, family asset base, peoples' willingness to use the proposed road, respondents' perception about the project.

Analysis of various aspects of the study amply reveals that the proposed project activities are not going to create considerable impact on the socio-economic conditions of the people in the study area. There will be no displacement of population for the project. Item-wise predicted impacts are given below:

7.2.1 Impact on Pattern of demand

With the implementation of the project and further development of the locality new type of demand pattern may emerge which is likely to place more importance on modern consumer goods and quality products. Hence, the impact of the project on the pattern of demand can be reasonably predicted as a shift from food to non-food items i.e., a consumer behaviour which may closely follow the Engel law. This is not a bad indication provided considerable income is earned by them; otherwise, if the shift is a substitution of necessary food requirements then it is not desirable in true socio-economic sense.

7.2.2 Employment and Income effect

From the questionnaire survey of the people of the study area it is indicated that 72.5% of working population derive their livelihood from wage labour. 20% of working population are engaged in business while 5% derive their livelihood from service. Only ~2.5% are dependent on agriculture. From the census data, it is indicated that ~60% of the working population of the study area are "Other Main Workers" i.e. they are employed in the ship-breaking yard and allied industries. Only about 1/3 of the workforce is engaged in agriculture and allied activities.

As usual during the stage of project development, substantial amount of employment and income are going to be generated. A large portion of these is likely to trickle down to the local people. Besides direct employment, the expansion project is expected to

generate substantial indirect employment in various ancillary activities such as additional goods transportation, trading in scrap metal and miscellaneous items recovered from ships, in small scale industrial units which will be engaged in repair and maintenance of mechanical equipment engaged in the expanded project, businesses providing service to workers engaged in the project and truckers engaged in transporting materials to and from the project etc. It is also expected that a few more industries may come up in the area which will process some of the additional materials recovered from scrapped ships (e.g. re-rolling mills, small foundries). The indirect employment and income effects are likely to be much larger than the direct effects of the proposed project.

Overall assessment of the employment and income effects indicates that the project has strong positive direct as well as indirect impact on employment and income generation.

7.2.3 Consumption Behaviour

To investigate the consumption behaviour of the respondents in detail, Marginal Propensity to Consume (MPC) is calculated by fitting the consumption function. The results of the regression analysis performed for fitting the consumption function are presented in **Table 7.3**. It is observed that the function gave uniformly good fit to data because R^2 is high and parameters are also found to be statistically significant at 1% level. The MPC worked out on the basis of the fitted consumption function is 0.713.

Table 7.3: Fitted Consumption Function

Form of the fit	Regression parameters		
	a	B	R^2
$C_j = a + b\ Y_j + U_j$ Where, C j=Consumption of jth respondent Y-Gross income of the jth respondent	12336.84	0.713 (29.1)*	0.915

Figures in ( ) indicate t-values * Significant at 1% level

Attempt has been made here to work out the multiplier effect of investment on the people of the study area. The calculations are done using the following model:
Considering that the consumption behaviour of the respondents closely follows the following type of consumption function:

$$C = a + bY \quad (1)$$

We know that, in equilibrium

$$Y = C + I \quad (2)$$

Where, Y = Gross income
C = Consumption
I = Investment

Putting (1) in (2) one gets,

$$Y = a + bY + I$$
$$\Rightarrow \quad Y = [1/ (1-b)]^* (a + I) \qquad (3)$$

Where, 1 / (1-b) is the multiplier.

Assuming that consumption behaviour of the people in the study area closely follows this fitted consumption function, one can easily see that existing size of the multiplier is 2.8. Hence, investment on this project and the consequent generation of additional income will have strong multiplier effect in raising average consumption.

7.2.4 Educational status

The project is expected to increase such aspirations by bringing opportunities of some direct & indirect employment for the local people. People are interested in getting technical education like Polytechnic, ITI, etc. as knowledge-based employment opportunities are coming up. The general awareness towards the importance of education is expected to increase further as a result of the new projects and hence, it can be said that the project has a strong positive impact on the level of education of the people of the study area.

7.2.5 Conclusions

Analysis of various aspects of the study amply reveals that the proposed project is going to create considerable impact on the socio-economic conditions of the people in the study area. On the basis of the present study the following major conclusions may be drawn:

i) Economy of the study area is dominated by industry. The proposed upgradation and expansion project is not going to cause any damage to the existing rural agrarian economy of the study area, in stead it may help agriculture by way of providing supplementary income which may result in increase investment in agriculture and consequently, agricultural production.

ii) People have a tendency to allocate higher and higher amount of income on consumer goods. The project is expected to foster the existing trend of shift in the pattern of demand of the local people from food to non-food items as a result of the modernising influences.

iii) The project has strong positive employment and income effects, both direct as well as indirect.

iv) The project is going to create positive impact on consumption behaviour by way of raising average consumption level of the people of the study area and income through multiplier effect.

v) The project is likely to speed up the growing view on importance of education among the people of the study area.

vi) Peoples' perception regarding the project, in general, is good specifically, due to the advantages of employment opportunity, business development etc. However, a few people are apprehensive about pollution.

7.3 RISK ASSESSMENT

Risk assessment has been carried out for the upgraded and expanded ship recycling yard, and based on the same; disaster management plan has been prepared which is as follows:

During the operation of the ship recycling facility, following risks have been identified.

1. Accidents during winching of lightened ship.
2. Accidents during docking or undocking of ships
3. Fire (oil and LPG).
4. Exposure to Asbestos
5. Spillage of oil during emptying of tanks
6. Accident at dismantling of detachable items
7. Exposure to Fumes / Gases
8. Accidents during material handling
9. Natural disasters

7.3.1 Accidents during winching of ships

Accidents during winching of ships may occur due to:

- Failure of winches
- Failure of winching cables / chains

To prevent the same, prior to deployment of equipment the following steps will be undertaken:

1. All equipment will be selected based on the actual weight of the ship (not only the LDT, but also fuel, lubricants, consumables, any residual cargo etc. remaining on board. The selected equipment will also have at least 20 – 30% capacity in excess of the requirement.
2. The equipment selected will be visually examined for any damage. Wherever possible, mechanical or other tests will be conducted to ascertain whether the equipments actually are able to take their rated loads with something to spare.

During actual winching of ships, multiple pre-tested cables and winches will be deployed. The strain will be monitored constantly. Standby equipment will be kept ready in case any of the deployed equipment fails. Safety supervisors will be deployed at strategic / vulnerable locations to ensure that safety procedures are strictly followed.

7.3.2 Accidents during Docking and / or Undocking of Ships

Docking shall involve, moving a ship weighing several thousand tones through a narrow opening only slightly larger than its own width and the stopping within a few meters.

This movement will take place against strong water currents. If not managed precisely, the ship may hit the dry-dock damaging itself and the dock.

Inside the dry dock, the ship will be placed on keel blocks. If the keel blocks are not properly positioned or are unable to bear the weight of the ship, the ship may topple or sag or hog damaging itself and / or the dock. Workers inside the dock or on board the ship may be injured in such cases.

To prevent such accidents, only certified mariners shall carry out docking and undocking of ships with assistance of tugs. Rubber fenders will be placed along dock walls to protect civil constructions.

The dry-dock will have keel blocks capable of taking the weight of the largest ships likely to be handled. All keel blocks will be properly inspected before and after use to ensure their integrity. All damaged keel blocks will be scrapped. All safety precautions will be taken during emptying and filling of dock. Each dry dock will have a dedicated Safety Department for ensuring proper safety precautions during all operations. Periodically safety audit shall be carried out by both internal auditors and independent external auditors. The recommendations of the Safety Auditors shall be recorded and implemented in a time bound programme.

7.3.3 Fire (Oil and LPG)

Industrial activities, which produce, treat, store and handle hazardous substances, have a high hazard potential endangering the safety of man and environment at work place and outside. Recognizing the need to control and minimize the risks posed by such activities, the Ministry of Environment & Forests have notified the "Manufacture Storage & Import of Hazardous Chemicals Rules "in the year 1989 and subsequently modified, inserted and added different clauses in the said rule to make it more stringent. For effective implementation of the rule, Ministry of Environment & Forests has provided a set of guidelines. The guidelines, in addition to other aspects, set out the duties required to be performed by the occupier along with the procedure. The rule also lists out the industrial activities and chemicals, which are required to be considered as hazardous.

The risk assessment has been made in a systematic manner covering the requirements of the above-mentioned rules. Accordingly subsequent sections have been divided as follows:

i) Applicability of the rule
ii) Description of hazardous chemicals
iii) Hazard identification
iv) Hazard assessment
v) Consequence analysis
vi) Brief description of the measures taken and
vii) On site emergency plan

Applicability of the Rule

At the project, furnace oil (Bunker C Oil, Heavy Fuel Oil, Residual Fuel Oil No. 6 etc.), diesel oil (HSD), engine oil, gear oil and hydraulic oils will be recovered from the ships. LPG will be used for cutting ships. HSD is also used as fuel for mobile material handling machinery and portable generators which power fans, blowers, pumps etc. on the ships being broken.

A new 80,000 DWT tanker consumes about 50 t/d of furnace oil (F.O.) while running in ballast (i.e. not carrying any cargo). A Bulk Carrier of comparable size usually has less powerful engines and consumes less fuel, whereas a Container Vessel is likely to consume more fuel on account of its more powerful engine. When the main engine is not running, an 80000 DWT ship consumes about 5 t/d of HSD run its auxiliary generators for powering onboard lights, navigation & communication equipment, crews' living quarters, refrigeration and air conditioning systems, etc. Old ships are likely to consume more fuel. A ship is required to maintain minimum 5 days fuel reserves on board. It is expected that maximum of about 1000 t (but usually less than 500 t) of F.O. remains on board a ship when it is beached. As part of the "Decontamination" process, which is mandatory for receipt of breaking permission, the entire fuel (F.O. and HSD), engine & lubricating oils are pumped out into road tankers and dispatched to authorized recyclers; no fuel or lubricating oil is stored on the plots.

Light Diesel Oil is used as fuel for the incinerator at the TSDF. LDO is stored in an over-ground tank at the TSDF.

As per Part I of Schedule 1 of "The Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989":

- *Highly Flammable liquids* are those liquids whose flashpoint is higher than 23^{o}C but less than 60^{o}C.
- *Flammable liquids* are those liquids whose flashpoint is higher than 60^{o}C but less than 90^{o}C.

The flash points of HSD and LDO are ~38^{o} C i.e. they can be classified as *Highly Flammable Liquids*. The flash point of F.O. is 66 ^{o} C i.e. F.O. can be considered as a *Flammable Liquid*. The flash points of engine oil and gear oil are above 150^{o}C and that of hydraulic oil more than 200^{o}C i.e. engine oil, gear oil and hydraulic oils cannot be considered as flammable liquids.

At the project, LPG-Oxygen torches are used for cutting ships. It has been mentioned in Chapter 2 (Clause 2.7.4) that each plot will stock maximum of 3 days' requirements of LPG. The plots with the highest productivity require 60 nos. 19 kg LPG cylinders per day.

To decide whether the above mentioned industrial activities are likely to come within the scope of the above mentioned "Manufacture Storage and Import of Hazardous Chemicals Rules", pertaining to occupiers guide to the hazardous chemical regulation - 1989 and the threshold quantities mentioned in the rules are used as given in **Table 7.4.**

Table: 7.4: Threshold Quantity & the Chemicals to be Stored and Handled at the Ship Recycling facility

Chemical to be Stored / Handled	Qty. Stored / Handled (In t) And Storage / Handling Conditions	Whether included in List of Hazardous & Toxic Chemicals	Lower Threshold Qty. (in t)	Upper Threshold Qty. (in t)
LPG	220 t max. *; Liquid & pressurized and stored in steel cylinders. On a single plot max. ~3.4 t (180 cyclinders) of LPG stored	Yes	15	200
Oxygen	990,000 Nm^3 max. (=~1416 t) *; Pressurised and stored in cylinders or cryogenic storage.	Yes	200 #	2000 #
*Computed on the basis of 5.5 Mt/yr of annual production, 4 kg LPG & 18 Nm^3 oxygen required for 1 t steel and maximum 3 days' requirements stored. # For liquid oxygen. Most of the oxygen is stored as pressurized gas in cylinders.				

From the above table it can be seen that the maximum quantity of LPG stored on a single does not exceed the lower threshold quantity. Accordingly only Rule 17 i.e. preparation and maintenance of material safety data sheets for LPG and Furnace Oil are required.

Description of Hazardous Chemicals

The only hazardous chemical, which is handled regularly at the project is LPG. The Material Safety Data Sheets of LPG and Furnace Oil are as follows:

DATA SHEET

LPG	CAS : 68476-85-7
$C_3H_8/C_3H_6/C_4H_{10}/C_4H_8$	RTECS : SE7545000
Synonyms & Trade Names	DOT ID & Guide : 1075 115
	Bottled gas, Compressed petroleum gas, Liquefied hydrocarbon gas, Liquefied petroleum gas, LPG [Note: A fuel mixture of LPG, propylene, butanes & butylenes.]
Exposure	NIOSH REL: TWA 1000 ppm (1800 mg/m^3)
Limits	OSHA PEL: TWA 1000 ppm (1800 mg/m^3)
IDLH	Conversion
1 ppm = 1.72-2.37 mg/m^3	2000 ppm [10%LEL] See: 68476857

Physical Description	Colorless, non-corrosive, odorless gas when pure. [Note: A foul-smelling odorant is usually added. Shipped as a liquefied compressed gas.]		
MW: 42-58	BP: >-44°F	FRZ:	Sol: Insoluble
VP: >1 atm	IP: 10.95 eV	RGasD: 1.45-2.00	
Fl.P: NA (Gas)	UEL: 9.5% (LPG) 8.5% (Butane)	LEL: 2.1% (LPG) 1.9% (Butane)	
Flammable Gas			
Incompatibilities & Reactivities	**Strong oxidizers, chlorine dioxide**		
Measurement Methods	**NIOSH S93 (II-2) ; See: NMAM or OSHA Methods**		

Personal Protection & Sanitation (See protection) Skin: Frostbite Eyes: Frostbite Wash skin: No recommendation Remove: When wet (flammable) Change: No recommendation Provide: Frostbite wash	First Aid (See procedures) Eye: Irrigate immediately (liquid) Skin: Water flush immediately (liquid) Breathing: Respiratory support
Respirator Recommendations	NIOSH/OSHA
Up to 2000 ppm	(APF = 10) Any supplied-air respirator(APF = 50) Any self-contained breathing apparatus with a full face-piece

Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions

(APF = 10,000) Any self-contained breathing apparatus that has a full face-piece and is operated in a pressure-demand or other positive-pressure mode (APF = 10,000) any supplied-air respirator that has a full face-piece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus.

Escape: Any appropriate escape-type, self-contained breathing apparatus

Important Additional Information about Respirator Selection

Exposure Routes: Inhalation, skin and/or eye contact (liquid)

Symptoms: Dizziness, drowsiness, asphyxia; liquid: frostbite

Target Organs: Respiratory system, central nervous system

DATA SHEET

PRODUCT IDENTIFICATION AND USE

Product name: Furnace Oil **PIN #, UN # 1202**

Chemical name: None **TDG, DOT class:** Class 3

Common names: Home heating oil No. 2. Number 2 burner oil **Packing group:** III
and synonyms Bunker C oil, Residual Fuel Oil No. 6 **Shipping name:** Diesel Fuel; Fuel Oil**;** Gas oil, Heating oil

Product use: Fuel

WHMIS Combustible liquid Class B Division 3
classification Very toxic Class D Division 1 Subdivision A

Hazard codes **NFPA** Health 4 **HMIS** Health 4
Flammability 2 Flammability 2
Reactivity 0 Reactivity 0

NFPA & HMIS Ratings: 0=Insignificant/No Hazard. 1=Slight Hazard. 2=Moderate Hazard. 3=High/Serious Hazard. 4=Extreme/Severe Hazard.

HAZARDOUS INGREDIENTS

Ingredients	CAS#	Wt (%)	ACGIH-TLVs (2004	OSHA ELs (2004)	NIOSH ELs (2004)	LD50 (rat, oral)	LC50 (rat, 4 hours)
API No. 2 fuel oil	68476-30-2	100	100 mg/m^3 TWA (vapour & aerosol)	NAv for this product name or CAS#		>5 g/kg	~5g/m^3
May contain: Benzene	71-43-2	Trace	0.5 ppm TWA 2.5 ppm STEL	10 ppm TWA 25 ppm CEILING 50 ppm PEAK	0.1 ppm TWA 1.0 ppm STEL	0.9 g/kg	13,200 ppm
Polycyclic aromatic hydrocarbons (PAHs) which may include *Naphthalene*	Various	Up to 10	Various	Various	Various	Various	Various
	91-20-3	Trace	10 ppm TWA 15 ppm STEL	10 ppm TWA	10 ppm TWA 15 ppm STEL	0.49 g/kg	>0.17 g/m^3
May also contain: Sulphur Which may result in the evolution of: Hydrogen sulphide (H_2S)	7704-34-9	0.05-0.50	NAv	NAv	NAv	>0.008 g/kg	NAv
	7783-04-6	NAp	10 ppm TWA 15 ppm STEL	20 ppm CEILING 50 ppm PEAK	10 ppm CEILING	NAp	444 ppm

Furnace oil is a complex mixture of hydrocarbons. Its exact composition depends on the source of the crude oil from which it was produced and the refining methods used. Furnace oil contains hundreds of individual organic chemicals. This section identifies only some of the well-known chemical constituents.

PHYSICAL DATA

Form: Slightly viscous, oily, liquid

Colour: Yellowish-brown

Odour H_2S smells like rotten eggs

Note: H_2S deadens the sense of smell. Absence of rotten egg smell does not mean absence of H_2S.

Odour threshold: <0.15 ppm for H_2S

Specific gravity: 0.830 to 0.879 @ 20°C

Vapour density: NAv

Vapour pressure: 2.12 to 26.4 mm Hg @ 21°C

Evaporation rate: NAv

Boiling point: 184 to 339°C

Freezing point: NAv

Coefficient of water/oil distribution 3.3 to 7.06 (Log Kow) pH NAp

FIRE AND EXPLOSION HAZARDS

Flammability: ☐ **Yes** ☐ **No**

Conditions Easily ignited by heat, sparks or flames.

Flash point: 66°C

Auto ignition temperature: 257°C

Lower flammable limit: 0.6 to 1.3%

Upper flammable limit: 6 to 7.5%

Explosion data: **Sensitivity to: Mechanical impact** Not expected to be sensitive

Static discharge Vapour: yes

Means of extinction: In general, do not extinguish fire unless flow of product can be stopped. Use carbon dioxide, dry chemical, or foam. Cool containers with flooding quantities of water until well after the fire is out.

Special precautions: Vapour is heavier than air. It will spread along the ground & collect in low or confined areas (sewers, basements). Travels to source of ignition and flashes back. Containers may explode when heated.

Hazardous combustion products: H_2S and sulphur dioxide (SO_2). Carbon monoxide. Nitrogen oxides. PAHs and other aromatic hydrocarbons.

REACTIVITY INFORMATION

Stability: Stable

Conditions to avoid: Sources of ignition. Static discharges. High temperatures.

Incompatible substances: Oxidizers such as peroxides, nitric acid, and perchlorates.

Hazardous decomposition products: H_2S. SO_2. Carbon monoxide. Nitrogen oxides. Numerous aromatic hydrocarbons.

SECTION 6 – HEALTH HAZARD INFORMATION

Route of Entry Eye: Skin absorption (Furnace oil itself, as well as benzene & naphthalene), Inhalation, Ingestion

Hazardous Contact: Eye, Skin contact

Acute exposure: Coughing, headache, and giddiness following inhalation. Aspiration into the lungs can cause severe pneumonitis (serious lung irritation), with coughing, gagging, shortness of breath, chest pain, and/or pulmonary edema (fluid in the lungs). Ingestion may produce nausea, vomiting, and cramping. Kidney effects and systemic edema have been reported after severe exposure. H_2S is very toxic. At concentrations as low as 1 to 5 ppm, nausea and severe eye irritation may occur. Sense of smell may be impaired at about 20 ppm, with headache and respiratory tract lung irritation. At 250 to 500 ppm, potentially fatal pulmonary edema may occur. Dizziness, sudden (often fatal) collapse, unconsciousness, and death occur at higher concentrations. Note: Pulmonary edema may be delayed as long as 48 hours after exposure.

Chronic exposure: Kidney, gastrointestinal, blood, and skin disorders. Headache, nausea, vomiting. Fatigue, and severe nervous and respiratory system symptoms may follow survival of H_2S poisoning**.**

Carcinogenicity: Benzene and certain PAHs are known to be carcinogenic**.** Exposure to fuel oils during refining is considered "probably carcinogenic to humans" IARC and NTP classify untreated and mildly treated mineral oils as known human carcinogens. ACGIH, EPA, NIOSH, and OSHA have not classified them.

Mutagenicity Not known to be mutagenic; **Reproductive Toxicity:** NAv

Toxicologically synergistic products: Other CNS depressants can be expected to produce additive or synergistic effects.

FIRST AID

Inhalation: Move victim to fresh air give artificial respiration if breathing has stopped and if a qualified AR administrator is available. Apply CPR if both pulse and breathing have stopped. Obtain medical attention immediately.

Ingestion: Never give anything by mouth if the person is unconscious, rapidly losing consciousness, or convulsing. If the person is conscious, have them drink 8 to 10 ounces of water or milk to dilute the material in the stomach. Do not induce vomiting. If vomiting occurs spontaneously, have the person lean forward to avoid aspiration. Obtain medical attention immediately.

Eye: If irritation occurs, flush eye with lukewarm, gently flowing fresh water for at least 10 minutes.

Skin Quickly and gently blot away excess chemical. Gently remove contaminated clothing and shoes under running water. Wash gently and thoroughly with water and non-abrasive soap. Obtain medical assistance.

PRECAUTIONARY MEASURES

Do not attempt rescue of an H_2S knockdown victim without the use of proper respiratory protective equipment.

Personal protective equipment

Gloves: Nitrile, VitonÊ , Polyvinylchloride, Tychem®BR/LV, or Tychem®TK preferred**.**

Eye : Chemical safety goggle or face shield, as a good general safety practice.

Respiratory NIOSH-approved SCBA or air line respirator with escape cylinder for confined spaces or work with sulphur-containing product. A qualified occupational health and safety professional should advise on respirator selection. If an air-purifying respirator is appropriate, use a "P series" filter & organic vapour cartridges**.**

Clothing & footwear: Coveralls to prevent skin contact with product. If clothing or footwear becomes contaminated with product, completely decontaminate it before re-use, or discard it.

Engineering controls Handling procedures & equipment

Enclose processes. Use local exhaust ventilation to remove vapour at its site of generation. Handle laboratory samples in a fume hood. Use mechanical ventilation in confined spaces. Avoid heating open containers of product so as to minimize vapour production and accumulation. Use nonsparking equipment, explosion-proof ventilation, and intrinsically safe electrical equipment. Ground handling equipment. Have clean emergency eyewash and shower readily available in the work area.

Leak & spill Procedure

Keep unauthorized persons away Eliminate all sources of ignition. Ventilate area. Stop leak if it can be done safely. Prevent entry into sewers, waterways, or confined spaces. Absorb or cover with dry earth, sand or other non-combustible material and use clean, non-sparking tools to transfer to container.

Storage: May be stored at ambient temperatures. Containers should be vented and equipped with a flame arrester.

Shipping: Stable during transport. May be transported hot.

POLYCHLORINATED BIPHENYL

PCB

Common Synonyms	Oily liquid to solid powder	Light yellow liquid, or white powder	Weak odor
PCB Chlorinated biphenyl Arochlor Halogenated waxes Polychloropolyphenyls	Sinks in water.		

Stop discharge if possible. Keep people away.
Avoid contact with liquid and solid.
Call fire department.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Combustible.
Extinguish with water, foam, dry chemical, or carbon dioxide.

Exposure

CALL FOR MEDICAL AID.

LIQUID OR SOLID
Irritating to skin and eyes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.

Water Pollution

HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS.
May be dangerous if it enters water intakes.

Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook)

Issue warning-water contaminant
Should be removed
Chemical and physical treatment

2. LABEL

2.1 Category: None
2.2 Class: Not pertinent

3. CHEMICAL DESIGNATIONS

3.1 CG Compatibility Class: Not listed
3.2 Formula: $(C_{12}H_{10-x})Cl_x$
3.3 IMO/UN Designation: Not listed
3.4 DOT ID No.: 2315
3.5 CAS Registry No.: 1336-36-3

4. OBSERVABLE CHARACTERISTICS

4.1 Physical State (as shipped): Liquid or solid
4.2 Color: Pale yellow (liquid); colorless (solid)
4.3 Odor: Practically odorless

5. HEALTH HAZARDS

5.1 Personal Protective Equipment: Gloves and protective garments.
5.2 Symptoms Following Exposure: Acne from skin contact.
5.3 Treatment of Exposure: SKIN: wash with soap and water.
5.4 Threshold Limit Value: 0.5 to 1.0 mg/m³
5.5 Short Term Inhalation Limits: Data not available
5.6 Toxicity by Ingestion: Grade 2; oral rat LD_{50} = 3980 mg/kg
5.7 Late Toxicity: Causes chromosomal abnormalities in rats, birth defects in birds
5.8 Vapor (Gas) Irritant Characteristics: Vapors cause severe irritation of eyes and throat and cause eye and lung injury. They cannot be tolerated even at low concentrations.
5.9 Liquid or Solid Irritant Characteristics: Contact with skin may cause irritation.
5.10 Odor Threshold: Data not available
5.11 IDLH Value: 5 to 10 mg/m³

6. FIRE HAZARDS

6.1 Flash Point: >286°F
6.2 Flammable Limits in Air: Data not available
6.3 Fire Extinguishing Agents: Water, foam, dry chemical, or carbon dioxide
6.4 Fire Extinguishing Agents Not to be Used: Not pertinent
6.5 Special Hazards of Combustion Products: Irritating gases are generated in fires.
6.6 Behavior in Fire: Not pertinent
6.7 Ignition Temperature: Data not available
6.8 Electrical Hazard: Not pertinent
6.9 Burning Rate: Data not available
6.10 Adiabatic Flame Temperature: Data not available
6.11 Stoichiometric Air to Fuel Ratio: Data not available
6.12 Flame Temperature: Data not available

7. CHEMICAL REACTIVITY

7.1 Reactivity With Water: No reaction
7.2 Reactivity with Common Materials: No reaction
7.3 Stability During Transport: Stable
7.4 Neutralizing Agents for Acids and Caustics: Not pertinent
7.5 Polymerization: Not pertinent
7.6 Inhibitor of Polymerization: Not pertinent
7.7 Molar Ratio (Reactant to Product): Data not available
7.8 Reactivity Group: Data not available

8. WATER POLLUTION

8.1 Aquatic Toxicity: 0.278 ppm/96 hr/bluegill/TL_m/fresh water
0.005 ppm/336-1080 hr/pinfish/TL_m/salt water
8.2 Waterfowl Toxicity: LD_{50} 2000 ppm (mallard duck)
8.3 Biological Oxygen Demand (BOD): Very low
8.4 Food Chain Concentration Potential: High

9. SHIPPING INFORMATION

9.1 Grades of Purity: 11 grades (some liquid, some solids) which differ primarily in their chlorine content (20%-68% by weight)
9.2 Storage Temperature: Ambient
9.3 Inert Atmosphere: No requirement
9.4 Venting: Open

10. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook)

II

11. HAZARD CLASSIFICATIONS

11.1 Code of Federal Regulations: ORM-E
11.2 NAS Hazard Rating for Bulk Water Transportation: Not listed
11.3 NFPA Hazard Classification: Not listed

12. PHYSICAL AND CHEMICAL PROPERTIES

12.1 Physical State at 15°C and 1 atm: Solid
12.2 Molecular Weight: Not pertinent
12.3 Boiling Point at 1 atm: Very high
12.4 Freezing Point: Not pertinent
12.5 Critical Temperature: Not pertinent
12.6 Critical Pressure: Not pertinent
12.7 Specific Gravity: 1.3—1.8 at 20°C (liquid)
12.8 Liquid Surface Tension: Not pertinent
12.9 Liquid Water Interfacial Tension: Not pertinent
12.10 Vapor (Gas) Specific Gravity: Not pertinent
12.11 Ratio of Specific Heats of Vapor (Gas): Not pertinent
12.12 Latent Heat of Vaporization: Not pertinent
12.13 Heat of Combustion: Not pertinent
12.14 Heat of Decomposition: Not pertinent
12.15 Heat of Solution: Not pertinent
12.16 Heat of Polymerization: Not pertinent
12.25 Heat of Fusion: Data not available
12.26 Limiting Value: Data not available
12.27 Reid Vapor Pressure: Data not available

NOTES

Hazard Identification

Hazards associated with LPG are presented in **Table 7.5**.

Table 7.5: Type of Hazards

Name of the Chemical	Type of Hazard	Hazard Rating			IDLH Value	Vap. Press @ 1 atm.	Remarks
		Health	Flammability	Reactivity			
LPG	1, 9	1	4	0	--	--	Liquified under pressure & stored at ambient temp.
	Type of Hazard: *1. Flammable substance* *2. Oxidising substance, reacts with reducing agents* *3. Emits a toxic gas or vapour* *4. Emits an irritating gas or vapour* *5. Emits a narcotic gas or vapour* *6. Gas or vapour not dangerous other than displacing air* *7. Causes skin irritation or burns* *8. Toxic substance* *9. Explosive material under certain conditions*						
	Hazard Rating: *a. Health* *1 None* *2 Minor* *3 Moderate, could cause temporary incapacitation or injury* *4 Severe, short exposure may cause serious injury* *5 Extreme, short exposure may cause death* *b. Flammability* *1. None, Material does not burn* *2. Minor, material must be preheated to ignite* *3. Moderate, moderate heating is required for ignition and volatile vapours are released* *4. Severe, material ignites at normal temperature* *5. Extreme, very flammable substance that readily forms explosive mixtures* *c. Reactivity* *1. None, stable when exposed to fire* *2. Minor, unstable at high temp. or press and may react with water* *3. Moderate, unstable but does not explode, may form explosive mixture with water* *4. Severe, Explodes if heated or water added* *5. Extreme, readily explosives under normal condition*						

From the above table it can be observed that LPG is a dangerous material since it is gaseous under ambient conditions and can form explosive mixtures with air. The catastrophic potential of a hazardous substance depends both on toxicity and volatility. The ambient temperature vapour pressure of a substance is used as a measure of the ability to become air borne. Since LPG is gaseous at ambient temperature and pressure and it is stored in pressurised condition to keep it in liquid form, the catastrophic potential of this chemical is maximum. Accordingly, the consequence analysis carried out subsequently covers analysis of LPG since its release and in case of any eventuality it may affect the maximum area.

Furnace oil is also handled at the project (only for few days a year on each plot during unloading of residual fuel from ships). F.O. is a viscous liquid at ambient temperature and is not flammable unless heated. At the project, there is no provision to store F.O. Soon after grounding the ships, the residual F.O. on board is pumped out to road tankers which transport it away from the site.

Hazard Assessment

LPG is stored under pressurised condition and ambient temperature. In any plan hazardous situation arising due to:

- Failure in the monitoring of crucial process parameters e.g. pressure, temperature, etc.
- Failure control elements e.g. pressure, temperature level, flow controllers etc.
- Failure of safety systems, safety / relief valves, sprinkler systems, alarm etc.
- Mechanical failure of vessels or pipe work due to excessive stress, over pressure, corrosion etc.
- Wrong operation, failing to adhere to the safety norms etc.

It has been mentioned that release of LPG may lead to hazardous situation in case of accidental release of large quantity. Such situation is possible from the storage area where bulk quantities are stored. It is unlikely that small leakage through pipes, gaskets, glands or any other means within the user points will create a hazardous situation unless allowed to be released for a long time as will be established in the subsequent sections. It is expected that during such small leakage preventive steps will be taken within a specified time span.

F.O. and HSD offloaded from ships are not stored at the site. After a ship has been beached, and necessary clearances have been received, the ship's residual fuel (F.O.) is pumped out directly into road tankers and transported away. Since F.O. and HSD do not catch fire unless heated, simple safety precautions during pumping operations (no naked flames or running electrical equipment which can give off sparks near pipelines & receiving tankers) ensure that the F.O. / HSD do not catch fire. The plot's Safety Officer or one of his deputies ensure the same.

Consequence Analysis

In this section, accident consequence analysis to determine the consequence of a potential major accident on the installation, the neighbourhood and the environment has been discussed by evaluating the consequence of incidence involving hazardous materials vis-à-vis LPG. Consequence analysis also involves assessment of release quantity which is again dependent upon chemical, storing condition, type of release, duration etc. Catastrophic flammable material normally involves the air borne release of these materials. A potential catastrophic release of flammable material would involve air borne release and subsequent explosion or fire i.e. a sufficiently large fuel – air mixture within flammable mix rapidly developed and finds a source of ignition. However LPG is stored under pressurized condition (7 – 10 kg / cm^2) in liquid form in 19 kg cylinders and is distributed to the user points in these cylinders. Accordingly possible release

quantities under different conditions have been computed and presented in **Fig. 7.1**. From the figure it can be noticed that release rate & quantity of liquid LPG is much more than gaseous LPG. From Fig. 7.1 it can be noticed that this quantity of LPG in a full cylinder can be released through a 20mm diameter hole in about 40 seconds whereas it will take slightly more than 3 minutes, if the hole diameter is 10 mm. Thus spillage of LPG could be more catastrophic as it will be a steady continuous source of vapour.

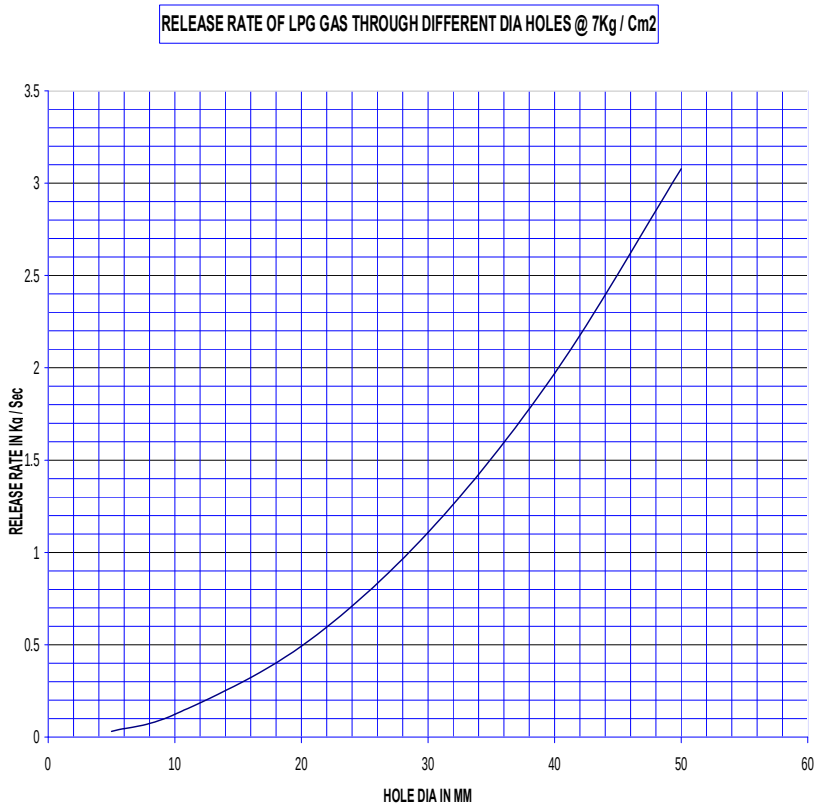


Fig. 7.1: Computed Possible LPG Release Quantities under Different Conditions

When a pressurised liquified gas is released from containment, a portion flashes off. Following flash off, residual liquid is at its boiling point and the vapourisation continues as a rate limit process. The second stage of rate limit vapourisation is usually regarded as relatively less important compared with the initial flash off. Fraction flash off is approximately 17% at 15°C as Butane. From the above it is clear that release of liquid LPG is potentially more catastrophic than release of vapour.

Flammable releases cause harms as a results of fire or explosion. Flammable vapour cloud resulting from rapid release of LPG is being calculated. Since the cloud center cannot be predicted, a conservation approach has been followed and it has been assumed that the cloud drifts towards downwind from the point of release when the danger of ignition occurs. Assuming that the cloud would drift in any direction, the "Hazard Area" around LPG storage area has been established by drawing a circle of radius equal to the distance, which may be affected due to heat intensity, if BLEVE occurs. A `BLEVE' can occur, if a pressure vessel becomes completely filled with liquid.

The temperature rises and pressure relief capacity is insufficient to keep the internal pressure from exceeding tank strength. One of the hazards of a `BLEVE' of a pressurized tank containing liquefied gas is the fireball created by combustion of the mixture of vapour liquid that is explosively dispersed by the sudden rupture. The sudden expansion of compressed vapour and the large quantities of vapour suddenly produced by liquid flashing combine to create a large ball of liquid droplets and vapour. The heat created by the burning of the dispersed liquid and vapour causes a powerful thermal updraft. As already explained, sudden release of a liquid stored at a temperature above its boiling point will result in the instantaneous and adiabatic vaporization of a fraction of the liquid. It is usually taken as half the tank capacity while calculating the radiative flux incident, on a target some distance away from the LPG tank.

Unconfined vapour cloud explosion is one of the most serious hazards of LPG. A vapour cloud explosion may cause harm by direct or indirect blast effects. It is the flashing superheated liquid, which tends to give rise to the largest vapour clouds. Most unconfined vapour cloud explosions have been caused by such flashing liquids.

The effect of over pressure on construction material is presented below in **Table 7.6**. Relation between Heat Radiation Intensity, Time and Effect on Man is also shown in **Table 7.7**.

Table 7.6: Effect of Different Overpressure

Over Pressure (Milibar)	Type of Damage
10 – 15	Typical window glass breakage
35 – 75	Windows shattered, Plaster cracked, Minor damage to some building
70 – 100	Personnel knocked down
75 -125	Panels of sheet metal buckled
125 -200	Failure of walls constructed of concrete blocks or cinder blocks
200 – 300	Oil storage tank ruptured
400 – 600	RCC Structure severely damaged
350 – 1000	Ear drum rupture
2000 – 5000	Lung damage
7000 - 10,000	Lethal

Table 7.7: Relation between Heat Radiation Intensity, Time and Effect on Man

Heat Radiation Level (KW / m^2)	Duration (Sec)	Effect
2.5	65	Blistering Starts
5	25	Do
8	13.5	Do
11	8.5	Do
18	4.5	Do
22	3	Do
10.2	45.2	Lethal (1%)
33.1	10.1	Do
146	1.43	Do

The assessments have been made for a jet fire resulting from leakage of 20 mm dia of one LPG cylinder and on the assumption that maximum instantaneous release of total 3.43 tonne release due to catastrophic rapture of all the cylinders in storage, i.e. if all

180 LPG cylinders rupture simultaneously. The results of the assessment are given in **Table 7.8** as follows:

Table 7.8 - Impact of various different types of releases vs. distance

Heat Radiation Level (Kw / m^2)	20 mm leak from 1 Cylinder (m)		
	Stability Class: B Wind Speed: 2 m/s	Stability Class: D; Wind Speed: 1.5 m/s	Stability Class: F Wind Speed: 1 m/s
4	24.97	38.94	15.2
12.5	0	15.9	0
37.5	0	0	0

Over-pressure (Bar)	Early Explosion Radii (m)		
	Stability Class: B Wind Speed: 2 m/s	Stability Class: D; Wind Speed: 1.5 m/s	Stability Class: F Wind Speed: 1 m/s
0.2068	79.17	79.17	79.17
0.1379	102.32	102.32	102.32
0.02068	395.18	395.18	395.18

Heat Radiation Level (Kw / m^2)	Intensity Radii for Fireball (m)		
	Stability Class: B Wind Speed: 2 m/s	Stability Class: D; Wind Speed: 1.5 m/s	Stability Class: F Wind Speed: 1 m/s
37.5	87.6	86.38	85.62
12.5	154.84	153.77	152.98
4	266.95	266.68	266.07

From the results, it can be seen that the over pressure of 0.2068 bar, which may cause rupture of oil storage tanks has a maximum reach on 79 m in worst case scenario. The cylinder storage of adjacent plots will be more than 100 m away from each other. So this may not result in any chain reactions cause cylinders of adjacent blocks to explode.

Also, the probability of spontaneous failure of one LPG cylinder is ~ 1 x 10^{-6} per year. The chance of leak / failure of one LPG cylinder ~2.6 x 10^{-6} per year. Therefore the chances of simultaneous failure / leak of 2 or more cylinders are almost nil.

Furthermore, LPG cylinders are stored separately in designated godowns which have all necessary safety features. Efforts are made so that minimum number of LPG cylinders are stored at the site. In order to reduce the amount of damage from fire and explosion, the larger plots may have more than one LPG godown well away from each other. All workers are indoctrinated that in case of any fire, whosoever notices the fire will sound the alarm and inform the shift-in-charge. The shift-in-charge inform security personnel and arrange to evacuate all personnel, except those who are required for fire fighting, from the area. Alang Fire-Station will be informed to deal with the emergency. The hospital will be informed to standby to handle casualties.

7.3.4 Exposure to Asbestos

Asbestos and asbestos containing material are handled at the ship recycling facility. Chronic inhalation of asbestos can lead to pulmonary disorders which may be fatal. To prevent the same a series of measures have been prescribed, which have been

described in Chapter 4 of this report (under clause 4.3.2.1). During removal of asbestos and asbestos containing material (ACM), a trained Asbestos Removal Supervisor is deployed to ensure implementation of all pollution control and safety systems and work practices.

7.3.5 Spillage of oil during emptying of tanks

Oil (fuel, lubricants) may be spilled during pumping out of fuel / oil from tanks and sumps. To prevent the same, pipes which are used for pumping operations are tested for damages / holes prior to being used. Usually a single flexible rubber pipe long enough to reach tanker-truck parked on the shore or a shore based sump is used for oil recovery. This eliminates joining two or more pipes for oil recovery. Absence of joints on pipelines eliminates potential points of spillage. Nevertheless, if joints are present on pipelines, they shall are tested for leaks prior to pumping operations; in addition drums are installed below joints on pipelines to catch any leaking oil. During pumping of oil, workers are deployed along the pipeline to look out for leaks. Whenever any leak is detected, pumping operations are shut down and necessary remedial measures are undertaken. A Safety Officer is also deployed during pumping out of oil to enforce safety precautions to prevent oil catching fire.

7.3.6 Accident during dismantling of detachable items

It is mandatory for all workers deployed on board the ships to wear safety helmets. Areas below areas where dismantling work is on are cordoned off. Workers engaged in dismantling work wear safety gloves while handling heavy / sharp / breakable objects. Workers working at height wear safety harnesses. The Safety Officer or his assistants ensure that all necessary safety precautions are strictly followed.

7.3.7 Exposure to Fumes / Gases

Workers engaged in cargo tanks of oil / gas / chemical tankers may be exposed to flammable and / or toxic gases. To prevent the same, all such areas are made gas free prior to the ship being granted permission for beaching. It is also mandatory to take Hot Work Certificate prior to cutting. Nevertheless, the atmosphere inside enclosed spaces is tested with gas meters for presence of explosive and toxic gas mixtures prior to worker being allowed to enter such areas. Precautionary measures have been described in Chapter 4 under Clause 4.9.2.3.

7.3.8 Accidents during material handling

At the project, heavy pieces of metal, some of them weighing several tonnes, are handled. Accidents may occur on account of failure of cranes, snapping of cranes' ropes and failure to follow safety precautions.

Cranes and other mechanical material handling equipment undergo periodic inspections and servicing as per manufacturers' guidelines. Hooks, chains and ropes used for material handling are also periodically inspected and tested to ensure their integrity.

7.3.9 Natural Disasters

The project is located in Seismic Zone III. The area is also prone to cyclones. The chronology of occurrence of natural disasters in the region area as follows:

Year	Disaster	Area	Impacts
1897	Cyclone	Off Jafarabad, Veraval, Gulf of Kachchh	Severe damage to mangroves
1909	Cyclone	Surat - Jafarabad - Kandla	Severe damage to fishing activities
1925	Cyclone	Kandla – Okha	Severe damage to local population
1944	Cyclone	Kandla	Damage to fishing activities
1954	Cyclone	Vadinar	Mangroves damaged
1960	Cyclone	Dwarka - Mandwa	Damage to fishing activities
1973	Cyclone	Vadinar	Mangroves damaged
1975	Cyclone	Okha	Severe damage to fishing activities
1989	Cyclone	Navlakhi - Vadinar	Severe damage to fishing activities
1996	Cyclone	Kandla	Mangroves destroyed. Damage to fishing activities
1998	Cyclone	Kandla	Damage to mangroves, inter-tidal fauna, coral reefs; habitat destruction of marine animals as well as birds' nesting grounds
1999	Cyclone	Dwarka - Naliya	Damage to mangroves, inter-tidal fauna, coral reefs; habitat destruction of marine animals as well as birds' nesting grounds
2001	Earthquake	Entire Kutch region	Severe destruction of human life and property. Possible damage to sub-tidal reefs.

In addition to the above, several severe droughts have occurred in the region. During droughts vegetation has been severely affected with consequent effect on fauna and livestock.

The following measures will be undertaken to reduce damage due to cyclones:

- In case of cyclone warnings, all regular work will be stopped and non-essential personnel withdrawn to inland shelters as far as possible from the coast.
- Small / loose objects may either be removed from the site or moved indoors depending on the severity of the approaching cyclone.
- Gas cylinders stored on the plots may be moved away from the site to inland storage locations. Gas cylinders on board the ships being cut should be

moved off the ship or moved to a secure room inside the ship. Trucks carrying gas cylinders to the ship recycling facility will be asked not to come to the site; rather they should remain as far as possible from the coast.

- Cranes' booms should be lowered and mobile cranes may be moved inland.
- On board the ships, all doors and portholes should be closed and secured. In the spaces / rooms which cannot be shut out from the elements, all loose objects should be removed or secured and debris lying on the floors should be cleaned up on a priority basis.
- Trucks loading or unloading material at the facility, should be asked to complete the loading as soon as possible and move inland as far as possible from the coast. Unloading may be suspended and the trucks moved inland. Trucks waiting to waiting to load / unload material may be asked to move inland without commencing operations.

The following measures will be undertaken to reduce damage due to earthquakes:

Before earthquakes

- All office buildings will be built as per local safe building codes for earthquake resistant construction.
- LPG / Oxygen cylinders should be stored under temporary structures so that the cylinders are not damaged in case the structure collapses.
- Booms of cranes should be lowered when not working (during meal breaks, night etc.).
- Prepare emergency evacuation plan and procedures. Workers should rehearse emergency procedures and evacuation regularly.
- Prepare emergency shelters which should have stocks of emergency medical, water and food supplies. The locations of these shelters should be prominently displayed. Emergency evacuation routes should lead to these shelters.

During an earthquake

- Workers engaged in gas cutting, should immediately shut down gas supplies and extinguish torches.
- Crane operators should lower the cranes' booms.
- Everybody should come out in the open. If quick emergence is not possible (e.g. from deep inside ships), people should take shelter under tables / shelves / small rooms to protect themselves from falling objects.
- Those people out in the open should move as far as possible from buildings and power-lines and towards the emergency shelters.

After an earthquake

- If there is a tsunami warning, arrange to immediately evacuate people as far inland as possible. Truck, buses and any available motor transport will be deployed for the evacuation.
- No regular work should resume for a couple of days until all aftershocks stop.
- Till such time only safety procedures, which could not be completed in a hurry, should be carried out.
- During this period, search and rescue operations should be undertaken to look for casualties. Dead and injured personnel, if any, should be evacuated to emergency aid centres and hospitals.
- Fires, if any, may be extinguished.
- Gas cylinders may be removed from the site.
- Partially fallen / damaged structures may be shored up or demolished as deemed fit.

7.4 OIL SPILLAGE

As mentioned earlier, at Alang-Sosiya SRY Furnace Oil (F.O.), Diesel and Lubricating Oils are unloaded from ships usually directly into road tankers which transport the recovered oil away from the yard. Hardly any of the recovered oil is stored at the yard. Oil recovery takes place within a few days of the ship being beached as part of the "Decontamination" process, which is mandatory for issue of Breaking Permission.

Heavy duty rubber hose-pipes are used for pumping out the oil from the fuel tanks and oil sumps directly to the tanker trucks or via small oil sumps on the plot. Only single hose pipes are used for oil removal. This eliminates joints on the pipeline which can be potential point of leakage.

The maximum residual fuel on a ship is rarely more than 500 t.

Oil Spills can take place at the ship recycling yard during pumping out of oil (fuel or lubricants). The oil spill can occur on water, land or (in future) inside the dry-docks (during decontamination).

Prior to oil pumping, all pipelines will be checked for leaks. During pumping operations, personnel will be deployed all along the pipeline to watch out for leaks. All of them shall be in touch with each other and directly with the pump operator. As soon as anybody sees sign of any oil leak, the pump operator shall be instructed to shut down the pump. This will limit the size maximum amount of the oil spilled only to the oil inside the pipeline, which shall not be more than 3 m^3 for a 400 m long pipeline.

The oil pumping personnel will be equipped with heavy duty polythene strips which will be used for plugging the leaks. For stretches of the pipeline passing over dry ground (ship's deck or land), easily handled drums will be kept handy to be placed below the leak / rupture on the pipeline to collect the leaking oil, till the leak/rupture is plugged.

Bags of saw dust and cotton rags will be kept handy, which shall be spread on the spilled oil to absorb it. The oil soaked material will be collected and packed in leak-proof polythene bags and labelled. The hard surface where the oil has spilled will also be wiped with cotton rags and the used rags will be bagged. If the oil has spilled on sandy or soil, or the oil slick has touched the beach, the contaminated soil / sand will be scraped off and packed in leak-proof polythene bags and labelled.

Part of the pipeline may pass over water. This part of the pipeline will be surrounded by a floating boom which shall be anchored to ensure that it is not swept away by tides. Cnsidering the conditions at Alang, "Fence Type Boom with external tnsion support" or "Shore Seal Boom" will be deployed.

Fence Boom with External Tension Member:

These booms are generally constructed of PVC / Poly Urethane Material . They are cmprise of external floats bolted onto a heavy PVC, polyurethane or nitrile / neoprene sheeting. Flat closed cell foam floats may be integrated into a lighter PVC / polyurethane material. Ballast may be provided using chain cable or weights. Tension members may use one or all of the following: Skirt material, sewn or welded webbing or the ballast member. In addition, they have a longitudnal tension member located horizontally opposed, deployed in the direction from which prevailing conditions are coming and attached to the boom at intervals.

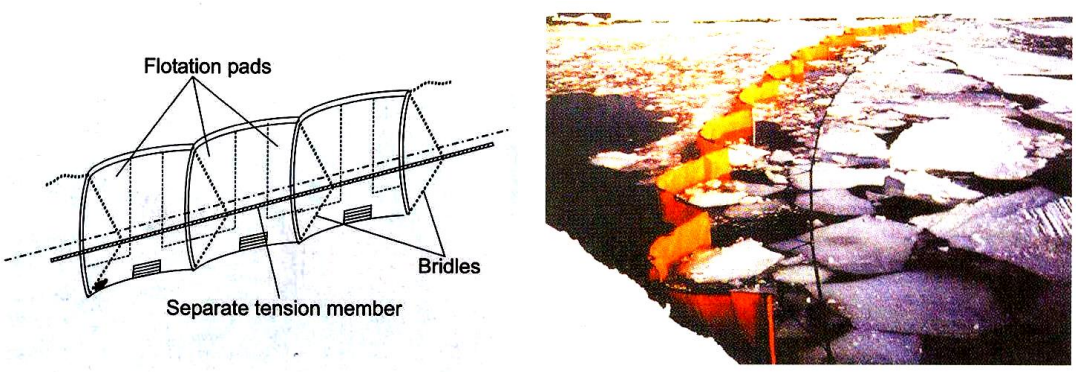


Fig. 7.2: Fence Type Boom with External Tension Member
(after IMO's Manual on Oil Pollution; Section IV: Combating Oil Spills)

Shore Seal Boom:

These are generally constructed in PVC or polyurethane materials. They comprise three seaparte chambers running the full lenghth of each boom section. The top chamber is air-filled and the lower two are filled with water. When the water recedes, the boom provides a positive seal against the shoreline while at other times it acts as a more conventional floating barrier.

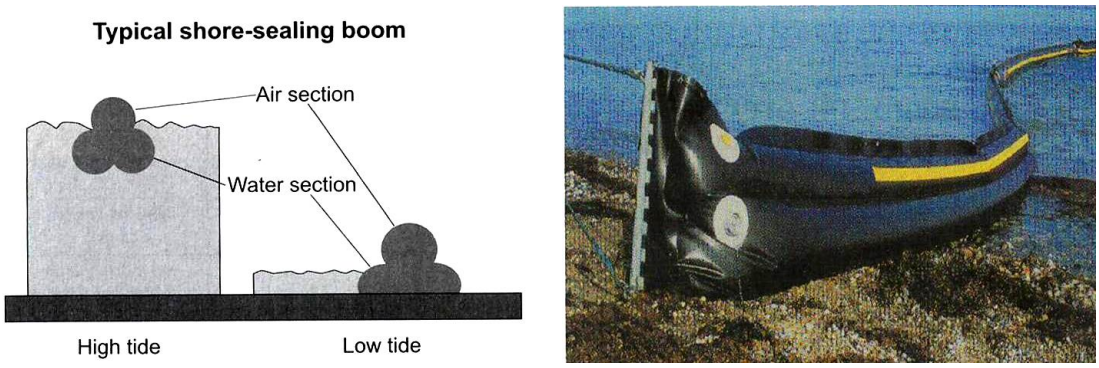


Fig. 7.3: Shore Seal Boom

(after IMO's Manual on Oil Pollution; Section IV: Combating Oil Spills)

In case of oil spill on water, the booms will contain the spilled oil. After the leak is plugged, the boom will be drawn shore-wards to contrate the oil slick so that the spilled oil can be collected.

After collecting the spilled oil, chemical disperants will be sprayed to disperse any oil which could not be collected.

All recovered spilled oil and oil contaminated saw dust, cotton rags, sand, soil and other disposable material will be packed in bags and taken to Alang TSDF for incineration.

7.5 GENERAL SAFETY FEATURES

a. All personnel are also adequately trained regarding safety aspects. This training is imparted by GMB's Training Centre at Alang
b. In addition specialized workers are given additional training in their areas of work (e.g. asbestos removal, gas cutting, emptying / cleaning of fuel tanks / cargo tanks of oil tankers / gas carriers etc.).
c. Adequate nos. of gas monitors are available to check work zone atmospheres.
d. Sufficient ventilation and lighting are provided in all workplace.
e. Good housekeeping is maintained at all work places.
f. First aid kit and oxygen cylinders with masks are kept ready within easy reach of all work places. Alang-Sosiya Recycling Yard has a Red Cross Hospital and some small private hospitals which have the resources for giving emergency treatment to victims of burns, blunt trauma, fume inhalation and major cuts. An ambulance is always kept ready at the Red Cross Hospital for evacuation of casualties. Dedicated communication link with major hospital will be available to warn them of incoming casualties.
g. All the workmen are provided helmets & shoes. Wearing of PPE (Boots, Helmet, Respirator, ear plug/muff, hand gloves, safety belt etc.) is enforced.
h. Workmen are not allowed to bring mobile phones to their work places to avoid being distracted while working. Only supervisors are allowed to use mobile phones while on board the ships.
i. Rest rooms and sanitary toilets are available for workers within all plots.

j. Periodic inspection, proper maintenance and timely replacement of worn out parts, training of personnel.

7.6 ON-SITE EMERGENCY PLAN

To take care of emergencies which may occur during various activities an Onsite Emergency Plan has been prepared. The plan contains instructions to be followed in case of an emergency, major or serious accident, failure of system / equipment, Fire or Power failure, stoppage of ventilation fans etc.

7.6.1 Objective of the Plan

The emergency plan has been prepared to ensure the smooth working of the ship recycling facility. The main objectives of the plan are to take immediate actions to meet any emergent situation making maximum use of combined in-plant and allied resources for the most effective, speedy and efficient rescue and relief operations. These are briefly enumerated as follows:

1. Cordon and isolate the affected area for smooth rescue operation
2. Rescue and treat casualties and safeguard the rest
3. Minimize damage to persons, property and surroundings
4. Contain and ultimately bring the situation under control
5. Secure and safe rehabilitation of the affected area
6. Provide necessary information to statutory agencies
7. Provide authoritative information to the news media.
8. Ward off unsocial elements and prying onlookers.
9. Counter rumor mongering and panic by relevant accurate information.

7.6.2 Methodology

Keeping in mind the detailed information on the proposed ship recycling facility, the plan is formed on the following basis:

- Identification of possible hazards in various areas and their impact on the surroundings
- Detailed information on the available resources and control measures.

7.6.3 Industrial Safety and Fire Fighting

As detailed above, many of work areas of the ship recycling facility are hazardous and fire-prone. To protect the working personnel and equipment from any damage or loss and to ensure uninterrupted production, adequate safety and fire fighting measures have been implemented for the project.

7.6.4 Safety of Personnel

All workmen employed in hazardous working conditions are provided with adequate personal safety appliance as applicable to the work like;

- Industrial safety boots
- Industrial helmets

- Hand gloves
- Ear muffs
- Welder's screens and aprons
- Gas masks
- Respirators
- Resuscitators

7.6.5 Fire Protection Facilities

Alang-Sosiya Ship Recycling Yard has its own dedicated Fire Station located approximately at the mid-point of the yard. The resources of Alang Fire Station are:

- 2 nos. water browsers (each of 16 kl capacity)
- 1 no. high pressure mini fire tender
- 4 nos. multipurpose fire tenders
- 2 nos. water tankers (each of 10 kl capacity)
- 4 nos. fire proximity suits
- 2 nos. breathing apparatus
- 1 no. foam generator (small)
- 2 nos. portable combined water-cum-foam monitors of 1700 l/minute capacity

The present available manpower of the fire station is:

- 1 Station Officer
- 2 nos. Pump Operators cum Drivers
- 2 nos. Leading Firemen (Fire Jamadars)
- 2 nos. fire fighters
- 10 nos. firemen

In addition to above, 17 sanctioned posts are vacant which are being filled.

Some of the older equipment are in a poor state as they have deteriorated much faster than normal because they are deployed next adjacent to the sea shore and are consequently exposed to salt laden air. The Station Officer's proposal for replacement of the older equipment is being examined by GMB's Head Office.

In addition to the centralized Fire Station, each individual plot has a number of portable fire-extinguishers to deal with small fires.

7.6.6 Yard Disaster Control

The On Site Emergency Plan has been prepared considering all the different units of the ship recycling facility.

A Central Disaster Control Cell has been set up under the direct charge of the Overall In-Charge of the facility. He is the person nominated to declare any major emergency and would be in-charge of all operations in such situations. In his absence, his deputy will assume charge. He is supported by the other nominated members of cell, e.g., In-charges of individual plots, Security, Fire, Safety, Administration and Medical Officer. In case of any major emergency, the Disaster Control Cell will operate from Disaster

Control Room. At the plot levels, Plot in-charges, shall be nominated as Controllers who will be assisted by Manager, Shift-in-charges and trained key workers to deal with any minor emergencies arising at the shop.

7.6.7 Information Flow

The following guidelines will be observed by any person after noticing a gas leak, fire, etc. till help is made available from Central Disaster Control Cell or Plot level Disaster Control Cell.

- Raise alarm
- Communicate to the control room about the incident/emergency.
- Communicate to fire station for relief in case telephone is available otherwise try to attract attention by any available means.
- Attempts to close doors, windows or ventilators of the room to prevent any contaminated air getting in.

7.6.8 Central Disaster Control Room

Upon receiving information from any site regarding emergency, the person operating from the Disaster Control room will:

- Depute a person to rush to site and assess the situation.
- Inform fire, transport, safety, medical and concerned control room.
- Organise operating personnel and arrange for control over the situation.
- Keep the management informed about the gravity of the situation from time to time.
- On receiving the call, the Disaster Control room would immediately direct the different supporting service agencies as enumerated below :
- Security and Administration services: responsible for safety of the yard against trespassers, saboteurs, any crowd, information to Government authorities and in the neighbourhood (if required), provision of transport facilities, telecommunication facilities and fire service facilities.
- Safety service: responsible for implementation of safety measures at work place and occupational safety.
- Medical service: responsible for providing medical care to the injured or the affected in an event of emergency.
- Stores: responsible for providing adequate number of tools, tackles and accessories for proper emergency control.
- Preservation of evidence and taking of photographs, if necessary, for future enquiries to determine the cause and taking further preventive actions.-
- Welfare: Provide food, clothes, shelter etc., as per requirements.
- Power and water supply: To ensure supply of fire fighting water requirement and provisions of power supply.

All emergency situations will be dealt in prompt manner as per the requirement. Trained personnel and rescue team are available to handle the various emergency situations. External regulatory authorities will also be taken in confidence to tackle the emergency situation.

The emergency Fire Response Diagram is displayed prominently on each plot (see **Photo 7.b**).

Photo 7.b: Emergency Fire Response Diagram on a plot

The emergency report chart is as follows:

- Whosoever sees the emergency shouts about the emergency and informs his supervisor.
- The Supervisor informs the Safety Officer and orders evacuation of the affected area. If the emergency involves fire he uses the fire-extinguishers readily available and calls for fire fighters.
- The Safety Officer evaluates the situation and if necessary, informs the Plot Manager, security personnel, orders emergency evacuation and / or summons trained personnel to deal with the emergency.
- The Plot Manager will evaluate the situation and if necessary, warn adjoining plots and summon help from outside including the Fire Brigade. The Plot Manager shall also report the matter to the Port Officer, Alang. The Plot Manager shall also inform Alang Red Cross Hospital for casualty evacuation and treatment.

- ❖ If deemed necessary, Port Officer, Alang shall report the matter to the local police station and District Administration.
- ❖ The Plot Manager shall inform the Factories Inspector and Regional Office of GPCB about the incident.

7.6.9 Plot Level Disaster Control Cell

The Controller at the plot level will take immediate charge of any emergent situation and will assume full responsibility regarding mobilisation of resources, guide and help service agencies in properly carrying out their assigned duties. The designated disaster controller should have full knowledge of the process aspects and he would decide whether to stop certain or all activities. He will be responsible for overall co-ordination. The duties of the plot level Controller are as below:

- Assess the scale of emergency and decide, if any possibility of major emergency exists and inform the Central Control Room, if necessary.
- Direct Safe close down of plot or any operation, if necessary.
- Direct evacuation of areas in the vicinity, which may be endangered.
- Ensure key personnel are called in immediately and they start carrying out their assigned duties.
- Direct rescue and fire fighting operations from safe operation point of view.
- Direct the plot personnel to the designated places for safe assembly.
- Control rehabilitation of affected areas and any victim on emergency.
- Ensure complete safety before resuming normal activities.
- At plot levels, teams of workers will be trained, who will be present at the incident site for doing the needful. They will assist and extend help to the following :
    - Fire brigade team in controlling fire.
    - Operational staff in shutting down operations.
    - Search, evacuation, rescue team.
    - Movement of vehicles for emergency control.
    - Plant pollution monitoring staff for carrying out atmospheric tests.
    - Medical team for providing necessary help.
    - Any other special operation.

7.6.10 Contingency Plan

It has been based on the following considerations:

- The plot and yard general layout.
- The available resources.
- The analysis of hazards.

And is aimed at the

- Pre-emergency activities.
- Emergency time activities.
- Post-emergency activities.

In the event of an emergency, the people from affected pockets would be directed to move to safe assembly places either at the plot level or at the yard level. The following facilities will be provided.

- Security service
- Fire fighting service
- Medical service
- Pollution control service
- Public relation service
- Telecommunication service
- Transport service
- Evacuation service
- Welfare service

On all existing functional plots an alarm system has been provided at a centralized place and actuators at the strategic locations in the individual plots.

In the new plots and the dry-docks similar systems with wailing type siren shall be provided. Supervisors deployed on the ships as well as on the plots are provided with mobile phones so that either an alarm can be raised directly or the plot office can be contacted from where the alarm can be raised. The wailing siren will mark the beginning of the emergency while a continuous note will mark the end meaning all clear signal.

All fire fighting equipment like portable fire-extinguishers, pumps, etc., are checked periodically to detect defective parts and such parts are immediately replaced. Mock drills are conducted for training the persons and to check the performance of men and equipment and also to keep them fit for any emergency (see **Photos 7.c**).

The yard presently has a small medical unit capable of administering only basic medical aid to casualties. Serious casualties have to be evacuated to Bhavnagar. However the medical facilities are being upgraded. GMB and SRIA are jointly constructing a large hospital at Alang for workers' welfare which will also have facilities for treating serious injury cases.

7.6.11 Rescue and Repair Services

The responsibility of effective working of Rescue and Repair Services will be with the incident controller.

Rescue Services

- To extricate persons from the debris of collapsed structures and save human lives.
- To hand over the extricated persons to first aid parties.
- To take immediate steps for the temporary supports or demolition of structures, the collapse of which is likely to endanger life or obstruct traffic.
- To cut off supplies of gas and electricity.

Photo 7.c : Views of Fire Fighting and Rescue Mock drill on 13th Feb., 2014

Trained Rescue parties shall be formed at plot levels, which will be provided with the following equipment:

1. Self contained oxygen breathing apparatus
2. Blower type gas mask
3. Resuscitators
4. Petromax lamp / Torches
5. Axe/hand saw
6. Bamboo ladder
7. Necessary Safety appliances
8. First aid box
9. Blankets

On-site emergency planning rehearsals need to be carried out from time to time. It requires monitoring by experienced persons from other similar factories or by senior officials from the State Inspectorate of Factories and/or the Directorate of Fire Services, who can help in updating the emergency plan procedure.

7.7 OFF-SITE EMERGENCY PLANNING

Off-site emergency planning is normally under the jurisdiction of the district administration. The designated official of the ship recycling facility is required to have co-ordination with the district administration for responsive action in off-site emergency planning.

7.8 FIRE FIGHTING ORGANISATION AND PROCEDURE

There are / will be trained fire fighting personnel on each plot and dry dock, who shall be under the control of the Safety Officer. The Safety Officer of each plot and dry-dock will be in contact with the I/C of Alang Fire Station regarding fire safety measures. The following important instructions will be given for fire prevention and tackling of any fire in the facility.

- Any worker who notices any fire will raise an alarm and inform his supervisor. The supervisor shall inform the Safety Officer and summon the plot's trained fire fighters. If the fire is too serious to be dealt with the resources available at the plot(s), help from adjacent plots and / or Alang Fire Station shall be summoned.
- While turning out for fire calls, the fire staff will be guided to the correct location immediately on their arrival.
- The plot manager and concerned supervisor will explain special risks involved and guide the In-charge of the Fire fighting crew. He will, however, not interfere in the method of fire fighting operations.

Fire drills are held in each zone periodically under the direction of the Fire Officer. Mock drills have also been organised under the supervision of experts from National Disaster Management Authority and Indian Register of Shipping.

The organisation and brief procedure for fighting small, major and simultaneous fire is as follows:

Degree of fire emergency	Fire chief	Siren code	Persons attending
Small fire	Supervisor in charge of affected area	No siren	First and second line fire-fighting teams
Major fire	Plot Manager / Port Officer, Alang	Wailings two minutes	First, second and third fire-fighting teams
Multiple fire	In-charge of affected area	No siren except for major fire	Persons already present at the scene of fire, operators
Small Fire: A fire in its incipient stage which is controlled by the first line fire fighting team			
Major Fire: The fire is spreading to other equipment or areas and which threatens to go beyond the control of first line and second line fire fighting teams			

Fire Control Officer : The Fire Control Officer will be in-charge at the scene of fire. In case of small fire, Supervisor of affected area will be Fire Officer. In major fire, Plot Manager or Port Officer, GMB, Alang will be Fire Control Officer. In case of multiple fires, concerned supervisors or Plot Manager or Port Officer will be Fire Control Officers.

Fire call : Fire call will be received at the fire station regarding occurrence of fire and its location. The message will be conveyed either by walkie-talkie or telephone or fire alarm or in person. While giving Fire call message on telephone, the person will identify himself and give the exact location and if possible the nature of fire. He should also confirm that the Fire call message is repeated by the Control room attendant. When the call message is given by the Fire alarm, the person would stand rear the Fire alarm to guide the Fire fighting team to the location of the fire.

Fire Siren Code : For small fire : No siren will be sounded.
For major fire : Wailing type continuously for two minutes.
For all clear : Straight sound for two signal minutes.

Fire sirens will be tested by sounding straight for one minute once a week at 10 a.m.

Small fires will be tackled by the first line team comprising of the persons already present at the scene of fire. However, the second line fire fighting team comprising of workers on the affected plot who have been trained in fire-fighting will also report at the scene of fire immediately after receiving the Fire Call of affected area at the time of fire. The team will consist of:

1. Fire Control Officer (the Supervisor of the affected area)
2. First Line Fire Fighting Team
3. Second Line Fire Fighting Team
4. Supervisors of areas adjacent to the affected area
5. Security personnel
6. Ambulance attendants and driver

In case of major fires, in addition to the First and Second Line Fire Fighting Teams, the Concerned Plot Manager shall summon help from Alang Fire Station and also inform the Port Officer who may depute trained fire fighters from other plots and also inform the local and District administration.

Responsibilities of Fire Control Room Operator:

- To take correct message regarding location, type of fire etc., from the caller.
- To repeat the message.
- To inform fire fighting personnel on duty immediately for turn out by hearing the bell.
- To inform first aid centre / Alang Red Cross Hospital.

Responsibilities of Fire Fighting Personnel:

- To report immediately at the scene of fire.
- To take instructions from Fire Officer.

Responsibilities of Fire Officer:

- To direct the deployment of Fire fighting personnel and fire fighting appliances.
- To organise additional fire fighting crew, if required, depending upon gravity of the situation.
- To guide plant employees in fire fighting.
- To co-ordinate between different groups of fire fighting personnel
- To control the spread of fire and rescue operation, if necessary.
- To extinguish the fire.
- To replenish the required fire fighting material/ equipment.
- To arrange relievers wherever necessary.
- To assess the situation and arrange additional help if necessary in co-ordination with Disaster Control room.
- To advice for all clear siren to be blown after the major fire emergency is over.

Responsibilities of Ambulance Driver:

- To report to the scene of fire with ambulance immediately.
- To carry the casualties, if any, to the medical centre as directed by Medical Officer/Fire Officer at the earliest.
- To park the ambulance without obstructing the fire fighting operations and traffic.

Responsibilities of Security personnel at the manned gate:

- To prevent entry of unauthorized persons.
- To keep the gate open for emergency vehicles and officers and staff concerned with fire fighting and allied operations.

Responsibilities of Medical Officer during major fire:

- To be available at the first aid centre for necessary medical advice.
- To depute one of the medical staff to the scene of fire to render any medical assistance, required at site.

Responsibilities of Head of the Personnel and Welfare Department during major fire:

- To arrange the transport of the fire fighting personnel with minimum loss of time in consultation with the Fire Control/Fire Officer.
- To make arrangements for the refreshment/meals for persons engaged in fire fighting.
- To inform the Fire Officer regarding the actions taken.

7.9 DISASTER MANAGEMENT AT TSDF

At the TSDF there is risk of fire and explosion at the incinerators(s). The TSDF has its own fire fighting arrangements comprising of fire-water storage tanks and various types of portable fire extinguishers namely Dry Chemical Powder type and CO_2 type & Foam Type to face any emergency arising due to the occurrence of fire. The details are:

Water Reservoirs

1.	Over ground water reservoir capacity	:	2 Nos. X 5 m^3
2.	Water reserved for fire	:	10 m^3

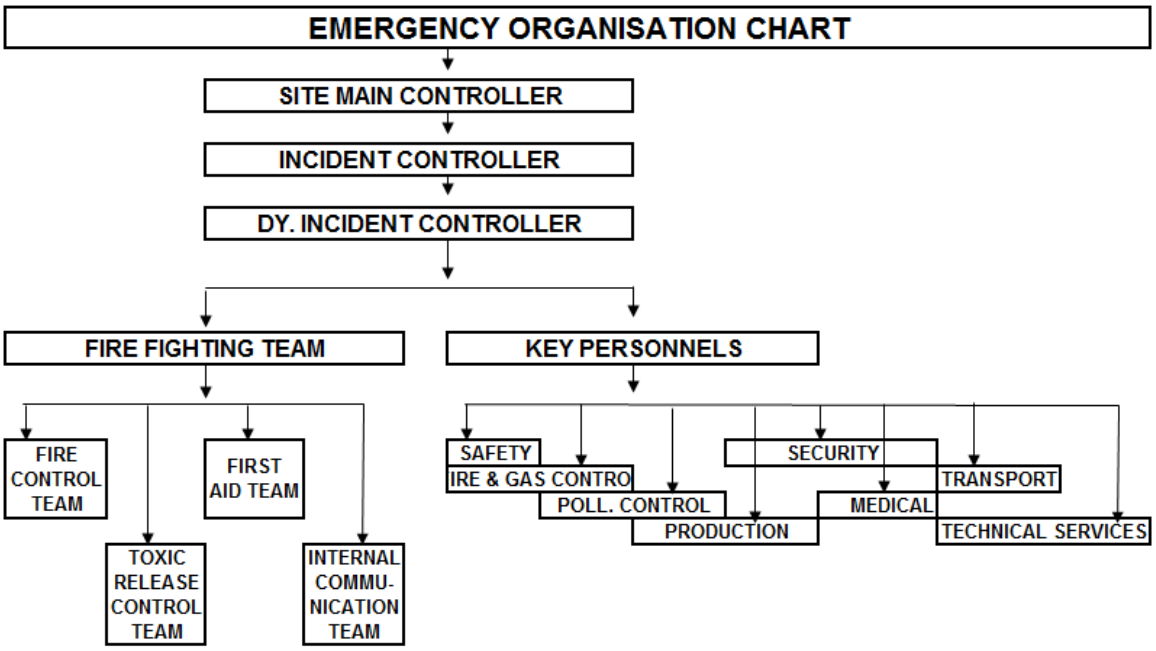
Fire Extinguishers

Sufficient number of dry Chemical Powder type and CO_2 type portable fire extinguishers are installed on each floor of the plant. Suitable fire extinguishers are also provided in all MCC room, PCC room & ETP, storage area & Security gate.

Details of fire extinguishers installed in various locations are as follows:

- At Administrative gate: 2 Nos. Foam type.
- At Laboratory : 1 No. ABC Type
- Storage yard : 1 No. DCP Type
- Land Fill Cell : 1 No. CO_2 type

Any emergency starts as a small incident that may become a major accident if not controlled in time. At the initial stages, the fire organization chart (would be prepared separately for each facility) shall need to be put into action. If the incident goes beyond control, the Main Incident Controller will need to actuate the on-site plan at the appropriate stage as considered necessary. During idle shift/ holidays, the security personnel will combat the incident as per the fire organization chart below and at the same time inform various emergency controllers for guidance and control the situation. An emergency organization chart is prepared by appointing key personnel and defining their specific duties that will be handy in emergency, details of the chart is as follows:



The site main controller will keep liaison for this purpose with the District authorities. External telephone facilities from site to Alang Fire Station, other units and Hospital, have been established for quick and instantaneous communication. The names of the key persons have been defined to establish contacts and co-ordinate Disaster Management Center in case of an occurrence of any major emergency.

In case of the occurrence of any off site emergency information shall be received first by the Police Control Room on telephone No. 100 or by Fire Brigade. The Police/Fire Brigade Control Room shall in turn inform the Police Commissioner, Collector and Municipal Commissioner. The safety department has a list of quantities of the resources like breathing air sets, rescue masks, fire extinguishers, water resources etc. available with various industries in the vicinity which can be spared under Mutual Aid System to deal with emergencies after receiving call from our factory.

When any disaster occurs, the TSDF will immediately inform the Disaster Management Center (DMC). With all available information, the DMC will act as per the Contingency Plan and also will immediately communicate to the District Collectorate.

A copy of the Onsite / Offsite emergency plan has been given by the site Main Controller to the Factory inspectorate who is acting as an Ex-officer Security to the District Contingency Plan. The plan has to be continuously updated and necessary changes have to be incorporated.

These are defined as the following:

- Any fire or explosion in the facility

- Any smoke outside/inside installation
- Strong persisting smell of hydrogen sulphide within the facility
- Any fire in the service buildings
- Fire or explosion in the process area
- Fire in the hazardous waste storage area

Emergency Response for Incinerator Plant

- Immediate action is the most important factor in the emergency control because the first few seconds count.
- Take immediate steps to stop fire and raise alarm simultaneously.
- Stop all operations and ensure closure of all isolation valves.
- As fires develop and spread quickly, so all out efforts should be made to contain the spread of fire.
- Plant personnel without any specific duties should assemble at the nominated place.
- All vehicles except those that are required for emergency use should be moved away from the operating area in an orderly manner at pre nominated route.
- Electrical system except the lighting and fire fighting system should be isolated.
- If the feed to the fire cannot be cut off, the fire must be controlled and not extinguished.
- Start water spray systems in the areas involved in or exposed to secondary fire risks.
- Block all roads in the adjacent area and enlist police support for the purpose, if warranted.

Actions in the Event of Fire:

- Basic actions as detailed above.
- Extinguishing fires: A small fire at a point of leakage should be extinguished by enveloping with a water spray or a suitable smothering agent such as CO_2 or DCP.
- Fire fighting personnel working in or close to un-ignited vapour clouds or close to fire, must be protected continuously by water sprays. Fire fighters should advance towards the fire downwind if possible- BE CAREFUL TO AVOID H_2S EXPOSURE.
- In case the only valve that can be used to stop the leakage is surrounded by fire, it may be possible to close it manually. The person attempting the closure should be continuously protected by water sprays, fire entry suit, water jet blanket and SCBAs etc. The person must be equipped with a safety belt and a manned lifeline. In case of rapid increase in decibel level, evacuate the area, as there would have been over pressurization.

Post Emergency Follow Up

- All cases of fire occurrence, no matter how small, must be reported promptly to the Coordinator for follow up.
- Under no circumstances should fire extinguishing equipment once used be returned to its fixed location before it is recharged/ certified fit by the Fire chief/ Safety Manager.

- Used fire extinguishers must be laid horizontally to indicate that they have been expended.

Communication System

As Effective and immediate communication of emergency is vital in the process of emergency handling. It helps to mobilize the resources at the earliest and attack on the emergency at its incipient stage. Under section 41B of the factories act, the disclosure of information regarding chemicals & their hazards to the workers, general public, local authority and the factory Inspectorate is compulsory. Such communication is at the District level. This information is already given.

Communication system at site has been divided into four parts:

1. Internal communication for informing the emergency
2. To outside key personnel, emergency services and authorities
3. To neighboring factories and public in the vicinity.
4. The communication for declaring the emergency.

The communication system with regard to raising the alarm, declaring the major emergency and procedures to make it known to other is explained below in brief

Alarm System

When the area of the site and the number of installations are more, siren has to be installed for general communication to the people. It can be used for declaring the Onsite as well as Offsite emergency and making the emergency known to the people. The siren is installed at security gate for declaring the emergency.

SMALL FIRE: No siren
MAJOR FIRE: A wailing Siren for two minutes. Sirens will be sounded three times for thirty seconds with an interval of 15 seconds in between
EMERGENCY: Same type of Siren as in case of major fire but the same will be sounded for three times at the interval of two minutes.
ALL CLEAR (For Fire): Straight Run Siren for two minutes.
TEST: Straight run Siren for two minutes. Siren system is being tested every Wednesday at 11.00 A.M.

Declaring the Major Emergency

The declaration of major emergency puts many agencies on action and the consequences may be serious, therefore, such declaration should be based on careful thoughts and matured judgment. Because of the scale of activity which will be activated after the declaration of the emergency, it is advisable to restrict the authority to declare it. In our case, Site Main Controller shall declare major emergency. In case of extra ordinary emergency Incident Controller/Dy. Incident Controller can take decision for declaring the emergency.

Emergency Control Centre (ECC)

The Emergency Control Centre is at Security Office. The emergency control center or room is a place from where the operation to handle the emergency are directed, coordinated and monitored. It will be attended by the site Main Controller and senior officials of fire Dept., Police Dept., Factory Inspectorate, District Authorities and emergency Services. Emergency control center is located in the security office building. All communication facilities and other required facilities are provided. ECC is located in the area having minimum potential to any risk and is close to the road to allow for easy access by the external agencies. The Emergency Control Centre has the following resources available:

- Copies of the DMP
- Layout Plan of the complex
- Information regarding Safety Equipment, Fire Fighting material
- A list of telephones of key and essential staff of the company along with their residential numbers.
- Copies of the local Telephone Directories.
- A list of important telephone numbers like those of neighbouring industries, Fire Brigade, Hospitals etc.
- Personal Protective Equipment.
- First – Aid Kit.
- Communication equipment – Internal and External telephones and other communication equipment.
- Requisite stationary items
- Personnel to act as messengers.

The communication equipment is checked periodically to ensure that they are functional. The ECC is capable of being activated within a few minutes upon declaration of an emergency.

Emergency Evacuation

- In case of disaster, all non-essential technical workers (who are not assigned any emergency duty) shall evacuate the area and report at the assembly point
- The need to evacuate the non-essential technical workers will be determined by the gravity of the emergency and assessment of the emergency by the Dy. Incident Controller
- With a view to accommodate the evacuated personnel from the affected plants/departments and also to make the evacuation safe, we have clearly marked an assembly point which has been displayed conspicuously by boards at various locations in the premises
- The assembly point is located near the Security Gate. The assembly point is approachable from all the units of the TSDF
- Security supervisor/guard are available round the clock and shall monitor the

assembled personnel

- Before reaching the assembly point, it is required to pass through an affected area, suitable personal protective appliances including masks, respirator etc. are to be used which is available in the plants. For a short duration even a wet handkerchief will be useful
- In our case, Site Main Controller shall declare major emergency. In case of extra ordinary emergency Incident Controller/Dy. Incident Controller can take decision for declaring the emergency.
- Information should be provided to senior officials of fire Dept., Police Dept., Factory Inspectorate, District Authorities, emergency medical services and to the corporate office of TSDF.

Medical Resources

The medical management for the possible emergency situations essentially consists of treatment for burns and maybe some asphyxiation cases. They could cause burns injuries. Material Safety Data Sheets and other relevant information is available at the facility to enable ready treatment of any casualty, should the unfortunate need arise. It is also proposed to circulate any important Health and Toxicology material available through the latest research to all Doctors.

Response Evaluation, Testing and Updating of the Plan

Formulation of a Disaster Management Plan cannot possibly be an end by itself. It needs to be tested by holding of periodical mock emergency simulation and drill. Any shortcomings revealed during such exercise should thereafter be corrected by amending the plan. The plan should be for times to come; hence, it must be reviewed at periodic intervals. The plan should be also reviewed and updated when:

- Major alteration or extension of plant is carried out
- Major change in habitation or land use of the neighbourhood takes place
- Important telephone numbers used are altered, facilities are changed

Mock drills activating the Disaster Preparedness Plan will be conducted periodically for ensuring its efficiency during emergency as well as for refinement and up gradation. These drills based on the plan will help achieve its objectives.

7.10 FOOD POISONING

In case of food poisoning in any of the facility's canteens, the following will be done :

- ❖ Disaster Controller will inform the Medical Officer on duty at Alang Red Cross Hospital for immediate first aid.
- ❖ Medical Officer will contact the District Hospital at Bhavnagar or super speciality hospitals located at Bhavnagar and seek their help, if necessary.
- ❖ Security will help in evacuating the affected people, in co-ordination with the Medical Officer.

7.10 MUTUAL-AID SYSTEM

At times the possibility of a major emergency (a situation out of control of facility authorities) cannot be ruled out. In such a case, the facility authorities would declare it to be a major emergency and total control would be transferred to the district level office of contingency plan committee. Necessary help would also be sought from Government sources having necessary infrastructure for dealing with disaster.

BENEFITS OF PROJECT

8.0 BENEFITS OF THE PROJECT

Following benefits will accrue from this project:

8.1 BENEFITS OF THE SHIP RECYCLING YARD

Dispose off Old Resource Guzzling Ships

Every year the expanded project will dispose off about 600 ships whose continued operation has become un-economical. These old ships tend to consume more resources (fuel, lubricants, spare parts etc.) and thereby cause more pollution. Some of these ships' structural integrity may have been compromised and on board machinery may have become partially and / or completely unserviceable. Continued operation of such ships is risky; any failure / accident can lead to severe environmental pollution and injuries or death of operating and / or maintenance personnel. It is best advisable to stop operating such ships.

Recover about ~5.5 Mt/yr of Steel, other metals and machinery

At the expanded project about 5.5 Mt/yr of semi-finished steel and other materials will be produced consuming only a small amount of non-renewable natural resources as compared to producing the same amount of steel utilizing basic raw materials. These include scrap metal, machinery, spare parts and other valuable materials, which will be recovered for re-use and / or recycling.

Peripheral development and creation of social capital

The project proponent will undertake peripheral development as part of GMB's CSR programme, which will benefit local villagers.

Strong employment generation potential

The project will directly employ about 40,000 people. Another about 10 - 12 times that number of people are expected to be indirectly employed (i.e. in supporting services and downstream industries).

8.2 BENEFITS OF THE UPGRADATION & EXPANSION PROJECT

Improve Environmental Performance and Reduce Pollution

The proposed up-gradation project will reduce release of pollutants to the environment by environmental friendly decontamination procedures, and improved pollution control systems.

Improvement of Infrastructure and Civic Amenities

The upgradation project will provide much needed proper housing facilities, sanitation, drinking water supply and civic amenities for workers. Some of the

amenities which are being / will be developed under the upgradation programme will reduce environmental pollution and also benefit local villagers.

Increase Market Share in the Industry

Ship owners from many countries, especially OECD countries, are constrained by their respective National Regulations from sending their ships to Alang for recycling because of Alang's alleged poor environmental performance and safety standards. The proposed modern decontamination facilities, plot improvement measures, upgradation of the existing TSDF are aimed at dispelling these misgivings and attract more ships for recycling.

Increase Economic Growth

The economy of Bhavnagar and nearby regions have grown considerably on account of the ship recycling yard. The proposed upgradation and expansion project will enable the economy to grow further.

Revenue to the Exchequer

The expanded project will generate substantial revenue for the state and central exchequers both directly as well as from downstream industries.

ADMINISTRATIVE ASPECTS OF EIA IMPLEMENTATION

9.0 ADMINISTRATIVE ASPECTS OF EMP IMPLEMENTATION

9.1 ORGANIZATION POLICY

The importance of environmental control has been recognized by of GMB as well as SRIA and they have taken necessary steps to identify and control pollution at Alang-Sosiya SRY, and also in the peripheral areas.

Environment Management has been declared as one of thrust areas of operation of Alang-Sosiya SRY. To abate pollution, Alang-Sosiya SRY has adopted a two-pronged strategy, which is as follows:

- Implementation of new state of art pollution control practices.
- Develop a well organized monitoring / analysis and inspection setup.

In line with GMB's commitment for environmental protection, Alang-Sosiya SRY shall strive to:

i) Conduct ship recycling operations in compliance with relevant environmental legislations and regulations.
ii) Periodic pollution monitoring.
iii) Setting up of occupational health set up including regular medical monitoring of employees engaged in the project.
iv) A well developed safety management organisation,
v) Preparation of Emergency/Disaster Control plan and a properly trained group to meet the emergency situations,
vi) Green belt development in and around the project area.
vii) Increasing the awareness in employees and villagers specially students towards environmental preservation.
viii) Periodical review of the System for continual improvement.

The planned ship recycling facility shall give maximum importance for adopting latest technologies for keeping the pollution to minimum levels possible.

9.2 ORGANISATIONAL SET UP

9.2.1 Manpower

GMB has a dedicated Environmental Cell (EC) at its Head Office. This unit deals with all environment related issues and works of GMB's ports and ship recycling yards. The EC is headed by the Dy. General Manager, Environment who is an environmental engineer. He is assisted by two Environment Managers, one of whom is an environmental engineer and the other an environmental scientist. At GMB's Alang Office there is a dedicated team of 10 (ten) Safety Officers for looking after Health Safety and Environment (HSE) related matters.

Manager (Planning) has been deputed as In-charge Director-Safety to impart health and safety related training to workers at the SRY. GEPIL, who operate and maintain the TSDF have their own dedicated HSE personnel.

GMB arranges for accredited laboratories for undertaking environmental monitoring as and when required. However the environmental monitoring of the TSDF is carried out by the TSDF's own quality control laboratory. GMB is contemplating to augment the resources of this laboratory to carry out regular environmental monitoring for the entire yard.

For development and maintenance of jobs like drainage, clearing settling pits etc. individual plot owners utilize their own resources. Plantation works are undertaken by GMB as well as individual plot owners. CSR activities are looked after by GMB as well as by the plot owners through SRIA. SRIA is looking after occupational safety and health of workers of Alang-Sosiya SRY.

For successful implementation of the environmental management plan other agencies of the State may also be involved by the ship recycling facility if required (for regulatory requirement or technical support). The coordinating agencies, which may be involved for specific environmental related activities, are given in **Table 9.1**.

Table 9.1: List of Coordinating Agencies, which may be involved for specific Environmental Activities

State Level Agency	**GPCB**	**SLD**	**SFD**
District Level	RO	FI	DFO
Study Area: Air, noise, water quality, waste water discharge quality monitoring.			
Project Area: Ambient air monitoring, work-zone air, work-zone noise, effluents from outlet of effluent treatment plants, fugitive emissions			
Project Area: Solid waste			
Project Area: Human Health			
Study Area / Project Area Interface: Road safety measures			
Project Area: Plantation Programme			

Index:

GPCB – Gujarat Pollution Control Board
SLD - State Labour Department
SFD – State Forest Department
DFO – Divisional Forest Officer, Bhavnagar
RO – Regional Officer Gujarat Pollution Control Board
FI - Factories Inspector

9.2.2 Co-ordination with Other Departments

The EC also co-ordinates with other departments like Planning, Occupational Health & Safety, Horticulture, CSR etc. and carries put liaison work with external agencies like State & Central Pollution Control Boards, Ministry of Environment, Forest and Climate Change (MoEF&CC).

9.2.3 Interaction with State Pollution Control Board

EC is in regular touch with GPCB and sends them regular progress reports on EMP in the prescribed format, as per the prevailing practice. Any new regulations considered by State/Central Pollution Control Board for the Industry shall be taken care of by the EC.

9.2.4 Training

Training facilities have already been developed at Alang-Sosiya SRY for Safety. The curriculum of the training will be augmented to include environmental control also. For proper implementation of the EMP, the officials responsible for EMP implementation will be trained accordingly.

The training on environmental control will be given to employees to cover the following fields:

- Awareness of pollution control and environmental protection to all.
- Operation and maintenance of specialized pollution control equipment.
- Disaster management.
- Environmental management.
- Knowledge of norms, regulations and procedures.
- Risk assessment.

SUMMARY AND CONCLUSIONS

10.0 SUMMARY AND CONCLUSIONS

The Executive Summary of the EIA / EMP report is being submitted separately. However this chapter gives a brief summary of the study and conclusions.

As a ship gets older, its operating and maintenance costs increase. Its structural integrity is also compromised due to corrosion and metal fatigue. At a certain time, it is no longer profitable and / or safe to continue operating the ship. The ship recycling industry performs the vital function of removing unprofitable and / or unsafe ships from the operational fleet and recovers and recycles / salvages the construction materials and components. Also by recycling ships, the demand for natural resources for producing the same materials / components by conventional method is drastically reduced with consequent reduction in pollution.

India is one of the major players in the world ship recycling industry. Alang-Sosiya is the world's largest ship recycling yard. The proposed upgradation project is aimed at improving environmental performance of the yard, safety and social amenities for workers. These measures will attract ship-owners, especially those from Western Europe, Japan and North America to send their ships to Alang-Sosiya for recycling.

Ministry of Environment, Forest and Climate Change (MoEF&CC) finalized the Terms of Reference (ToR) for preparation of EIA/EMP report for the proposed upgradation and expansion of existing ship recycling yard at Alang-Sosiya during the 141st Meeting of the Expert Appraisal Committee for Infrastructure Development, Coastal Regulation Zone, Building/Construction and Miscellaneous Projects of Ministry of Environment, Forest and Climate Change held on 26th-28th Nov., 2014. ToR was granted on 22nd Dec., 2014. EIA study has been carried out and EMP formulated mainly based on the baseline environmental data generated at site in summer season, 2015.

The existing ship recycling yard stretches over a length of ~10 km of coastline. There are total 167 plots available for ship recycling. These plots cover a total area 39.8803 ha. It is proposed to upgrade and expand the existing Alang-Sosiya Ship recycling yard by:

A. **Upgradation of Existing Ship recycling plots:** 70 plots in Phase-I and remaining 97 plots in Phase-II.
B. **Hazardous Material Removal Pre-treatment Facility**: Constructing two nos. of Dry dock facility for ships for pre-cleaning of hazardous materials and wastes (Dimension: l×b×h = 300m × 50m 11.5m). Dry-dock 1 at southern end of existing

yard and Dry- dock 2 about 2 km further south. Both the dry docks may also be used for ship repair and ship building purposes when there are no ships available for decontamination.

C. **Additional Environmental facilities:** (1).Waste oil treatment system (2). Incinerator at the existing dedicated Treatment Stabilization and Disposal Facility (TSDF) site located within Alang-Sosiya Notified Area.

D. **Improvement of Labour welfare infrastructure**: Housing including hospital facilities, community centre and community school to be developed for welfare of labourer's working at the Yard (Total built up area around: 94,700 m^2).

E. **Additional Plots: 15 nos. 100 x 90 m plots between two proposed dry-docks.**

The proposed dry-docks & associated infrastructure and new plots will come up in intertidal zone, over barren sea beach and the area immediately beyond. This area is owned by the Govt. of Gujarat and does not include any Forest Land. The labour welfare infrastructure too is being constructed on non-forest government land. A new effluent treatment plant (capacity same as that of existing one) and a waste incinerator (of capacity five times that of the existing one) will be constructed within existing Alang Waste Treatment Storage and Disposal Facility (which is located within Alang Notified Area).

A number of benefits are inherently ingrained in the upgraded and expanded ship recycling project as follows:

- The project recycles high quality steel and other materials. This reduces the pressure on limited natural resources and leads to significant energy savings.
- Machinery and various equipment on board the ships are salvaged to the maximum extent possible
- The project has generated direct as well as indirect employment and opened up opportunities for new businesses and industries which have led to economic growth.

GMB along with Ship Recycling Industries Association (representing the plot operators) will participate in improvement of the socio-economic conditions of the local people by generation direct and indirect employment, providing resources for social capital building etc in a significant way. In this regard, GMB has already set up a Safety Training and Labour Welfare Institute in 2003 at Alang to take care of training and safety needs of the workers of Alang-Sosiya SRY. It is mandatory for all workers to go through a pre-employment safety training course and refresher trainings subsequently.

Alang has a Red Cross Mission Hospital having with basic medical facilities for workers. For treatment of injuries requiring hospitalization, the injured worker is transferred by ambulance to well equipped hospitals at Bhavnagar which is about 55 km away. All the cost of treatment is borne by owner of the plot where the injured worker is employed. A well equipped hospital with trauma facilities is under construction at Alang for the SRY workers.

Most of the labourers reside in "kholi" type housing accommodation in surrounding area which do not have proper amenities. In order to provide proper housing and sanitation facilities, GMB in association with Ship Recycling Industries Association (SRIA) has taken the initiative to create a dormitory type housing facility for 1008 labourers in Phase-I, with a total cost of Rs.20.29 crores on GMB's land at Alang. More such housing with proper water supply, sanitation, community centre, schools for workers' children, playgrounds etc. will be built later. These measures will improve workers' quality of life. Proper sanitation facilities will also reduce environmental pollution.

DISCLOSURE OF CONSULTANT

11.0 DISCLOSURE OF CONSULTANT

The EIA/EMP report for upgradation and expansion of Alang-Sosiya Ship Recycling Yard of Gujarat Maritime Board (GMB) has been prepared by MECON Limited, a Public Sector undertaking under the Ministry \iof Steel, Government of India.

11.1 STATUS OF ACCREDITATION

MECON Limited is accredited by QCI/NABET for preparing EIA/EMP reports in 17 major sectors, including "**All Ship breaking yards including Ship breaking units**" vide their certificate no. NABET/EIA/1417/SA/007. This certificate is valid up to 04th February, 2017. (Copy Enclosed as **Annexure 11.1**).

Table 11.1: Details of sectors accorded to MECON under the QCI-NABET scheme for accreditation of EIA consultant organization

Sr. No.	Sector Number		Name of the Sector	Category
	As per MoEFCC Notification	As per NABET Scheme		
1.	1 (a) (i)	1	Mining of minerals including Opencast / Underground mining	A
2.	1 (b)	2	Offshore and onshore oil and gas exploration, development & production	A
3.	1 (c)	3	River valley, hydel, drainage and Irrigation projects	A
4.	1 (d)	4	Thermal Power Plants	A
5.	1(e)	5	Nuclear Power Projects and processing of Nuclear Fuel	A
6.	2 (a)	6	Coal washeries	A
7.	2 (b)	7	Mineral beneficiation	A
8.	3 (a)	8	Metallurgical industries (ferrous & non ferrous) – both primary and secondary	A
9.	3 (b)	9	Cement plants	A
10.	4 (b)	11	Coke oven plants	A
11.	6 (a)	27	Oil & gas transportation pipeline (crude and refinery / petrochemical products), passing through national parks / sanctuaries / coral reefs / ecologically sensitive areas including LNG terminal	A
12.	6 (b)	28	Isolated storage & handling of Hazardous chemicals (as per threshold planning	B

Sr. No.	Sector Number		Name of the Sector	Category
	As per MoEFCC Notification	As per NABET Scheme		
			quantity indicated in column 3 of schedule 2 & 3 of MSHIHC Rules 1998 amended 2000	
13.	7 (b)	30	All ship breaking yards including ship breaking units	A
14.	7 (c)	31	Industrial estates / parks / complexes / areas export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes	A
15.	7 (e)	33	Ports, harbours, jetties, marine terminals, break waters and dredging	A
16.	7 (f)	34	Highways, railways, transport terminals, mass rapid transport systems	A
17.	8 (b)	39	Township and Area development projects	B

MECON has also been accredited for functional areas. Details of the Functional Area Experts of MECON working in Environmental area are given in **Table 11.2.**

Table 11.2: Brief description of the Functional Area Experts of MECON

Sr. No.	Functional area code	Functional Area Approved
1.	AP	Air Pollution Prevention, Monitoring & Control
2.	WP	Water Pollution Prevention, Control & Prediction of Impacts
3.	SHW	Solid and Hazardous Waste Management
4.	SE	Socio-Economics
5.	EB	Ecology and Biodiversity
6.	HG	Hydrology, Ground Water & Water Conservation
7.	GEO	Geology
8.	SC	Soil Conservation
9.	AQ	Meteorology, Air Quality Modeling & prediction
10.	NV	Noise & Vibration

Sr. No.	Functional area code	Functional Area Approved
11.	LU	Land Use
12.	RH	Risk Assessment & hazard Management

All EIA coordinators and Functional area experts are in-house experts of MECON.

Baseline environmental data generation covering micro-meteorology, air quality, water quality, soil quality and noise levels were carried out by a NABL accredited laboratory, M/s Mitra S.K. Private Limited, Kolkata, whose accreditation certificate is attached as **Annexure 11.2**.

Marine ecological studies were carried out by M/s Terracon Ecotech Pvt. Ltd. under the supervision of MECON Ltd. Copy of M/s Terracon Ecotech Pvt. Ltd.'s NABET certificate is enclosed as **Annexure 11.3**.

11.1 PROFILE OF EIA/EMP CONSULTANT

MECON Limited - a Government of India Enterprise Mini Ratna company under Ministry of Steel (established in 1959), is a premier multi-disciplinary consultancy organisation in the country. MECON's corporate Office is at Ranchi and has branches at Bengaluru, New Delhi, Bhubaneshwar, Kolkata, Burnpur, Vishakhapatnam, Bhilai, Durgapur, Rourkela, Bokaro, Mumbai etc. and also has its establishment at Lagos, Nigeria etc. MECON has till date completed ~5000 consultancy and EPC assignments covering wide range of field and services. The company is registered with International financial Institutions like World Bank (WB), Asian Development Bank (ADB), EBRD, ADB, UNIDO etc. MECON is the first engineering and consulting organization in the country to be accredited with ISO 9001 (now ISO 9001: 2000) by RWTUV of Germany.

There are about 36 specialized disciplines to cater to the various technical needs of the industries and infrastructural development. MECON's services include the whole range of work relating to setting up of industrial projects in the field of Environment, power, metallurgy and mining, ferrous and non-ferrous, chemicals/petrochemical and allied engineering complexes including specialized fields, such as, Defence Projects, mints/currency note presses. Services for Environmental engineering are provided to industries through MECON's Environmental Engineering Division.

MECON entered the business of Environmental Consultancy during the mid 1980s i.e. at the inception of this field in India. MECON also set up its own environmental engineering laboratory to undertake micro-meteorological, air quality, water quality, noise levels, soil quality and soil quality monitoring. By the time the EIA Notification came into force, MECON had already prepared a number of Environmental Impact Assessment and Environmental Management Plan (EIA/EMP) reports for various industries covering Integrated Steel Plants, Thermal Power Plants, Cement Plants, nuclear fuel processing complexes, Ship Recycling projects, open-cast / underground Mines (Uranium, Coal, Iron, Manganese, copper) etc. MECON is also called upon to perform the task of being a consultant-adviser to the Government of India and foreign governments on the technical front.

With this unique back up from independent specialized sections, MECON's consultancy services in the field of Environmental Engineering & Management includes but not limited to Project Specific EIA/EMP study, Regional EIA Study, ISO:14000 Consultancy, Environmental Audit, Ground water contamination study, Preparation of industry specific norms for CPCB, ETP/STP/Tailing disposal (FR/DPR/DE/Turnkey execution), Socio-Economic study, Rehabilitation & Resettlement study, Environmental Baseline data generation, Environmentally compatible land use zoning, Air Pollution (Dust Suppression & Dust Extraction Systems) /Water Management, Ecological study (Terrestrial & Aquatic/Marine), Effluent Treatment Plant, Sewage Treatment Plant and Rainwater Harvesting. The Environmental Engineering section of MECON has provided services for more than 350 numbers of projects.

Total manpower strength of MECON is more than 1700. MECON's Environmental Engineering Section is a multi-disciplinary group of about 25 engineers, specialists and scientists whose services are backed up by a sophisticated Environmental Engineering Laboratory.

MECON's Environmental Engineering Section is well equipped with various computerized predictive tools required for carrying out environmental studies and participates regularly in inter laboratory quality assessment exercise conducted by CPCB.

Table 11.3: List of Computer models for Environmental Studies

Developed in-house

- Multisource Dispersion Model based on Gaussian Model
- Screening Model to determine Max. GLC at most unfavorable meteorological condition
- Determination of Atmospheric stability
- Noise Propagation Model
- Subsidence Model (Coal)
- Coastal Zone Dispersion Model
- Model for preparation of Wind Rose

Procured

- USEPA approved models
    - Industrial Source Complex Short Term (ISCST)
    - AERMOD for Air Quality prediction
    - Industrial Point Source Complex Long Term (ISCLT)
    - Multiple Point Source Model With Terrain Adjustments (MPTER)
    - Fugitive Dust Model (FDM)
    - Qual 2E River Model
    - CALINE – 3 (Highway Model)
    - Complex Terrain Dispersion Model (CTDM PLUS)
    - Groundwater Modeling System (GMS)
    - Surface Water Modeling System (SMS)
    - Watershed Modeling System (WMS)
- Green Belt Model
- Phast Model for Risk Assessment

Environmental division has a sophisticated environmental engineering laboratory equipped with modern state of the art apparatus/instruments for carrying out pysico-chemical and biological analysis of environmental parameters. The equipment list is shown as **Table 11.4.**

Environmental Engineering laboratory of MECON is certified with BS OSHAS: 18001: 2007 with Occupational Health and safety management.

Table 11.4: List of Major Equipment at Environmental Laboratory

Name of Equipment	**Model/type**
High Performance Liquid Chromatograph (HPLC) with UV – Vis.	YL-9100
Microwave Plasma Atomic Emission Spectrophotometer	Agilent MPAES-4200
Atomic Absorption Spectrophotometer	ECIL, A AS - 4141
Gas Chromatograph with ECD, NPD and FID	Model – Trace Ultra Thermo make
Orion autochemistry system with 10 ion selective electrodes	ORION-960 ORION Research USA
HACH, Portable Laboratory System with DR-2000 Spectrophotometer	HACH, USA
Oil analyser	Wilks - USA
Spectrophotometers a) UV – Visible Spectrophotometer b) UV – Visible Spectrophotometer c) Spectrophotometer (Systronics) d) Colorimeter (Systronics)	 Make – ECIL Model- UV5704SS Make – Themo Fisher Model-Evolution 201 Sys – 106 Sys – 112
Mercury Analyser	MA 5840 E ECIL
NDIR based CO analyser	Make- Eco Tech, Model Serinus30C0
Flame Photometer	AIMIL Indigenous
Turbidity Meter	HACH- 2000
Conductivity Meter	HACH - 2000
pH Meter	Lab India-PHAN
TKN analyser	Pellican
Benzene sampler	Ecotech
Balance a) Top loading macro balance	 Mettler, PE – 3600

Name of Equipment	**Model/type**
b) Top loading microbalance	Mettler, AE – 240
Water Double distillation unit	Make- Bhanu Scientific
Autoclave	ADCO make Indigenous
Autoclave	SICO make
Ovens a) Mechanically hot air oven (Air convention type) b) Drying oven	 SICO ADCO
Muffle Furnace	Lab-equipment
Aquarium	Indigenous
Refrigerator	Godrej
Water distillation assembly (Ordinary)	Indigenous
High Speed Refrigerator Centrifuge	Seval RC5C Sorvall, USA
High Speed Research centrifuge	TC – 4100D Eltek
Eltek medico centrifuge	TC – 4155
BOD incubator	(Indigenous)- 3 nos.
Incubator cum shaker	Vikram Scientific (Indigenous)
Vacuum filtration pump	Indigenous
Stop Watch	Indigenous
Rotary sieve shaker	Indigenous
Water bath	Indigenous
Whatman filtration assembly	Whatman, UK
Laminar air flow system	Model–HL-62 Horizontal Laminar Flow, YSI-188
Heating Mantle	Indigenous
Hot Plate (Different sizes)	Indigenous
Magnetic Stirrer with hot plate	Indigenous
Glass thermometer (different ranges)	Indigenous
Phenol distillation unit	Borosil
Gutziet generator for Arsenic	Borosil
Fluoride distillation assembly	Borosil
Sox let extraction assembly	Borosil
Kjeldahl Nitrogen Assembly	Borosil
Semi-micro nitrogen assembly	Borosil
Cyanide distillation unit	Borosil
Fume chamber	Modern Lab Interio
Flocculator (Jar testing apparatus)	Lab equipments Pvt. Ltd.

Annexure 11.1: NABET Accreditation Certificate of MECON Ltd.

Quality Council of India

National Accreditation Board for Education & Training

CERTIFICATE OF ACCREDITATION

This is to certify that

M/s Mecon Limited, Ranchi

is hereby accorded accreditation under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations (Version 3)

Scope of Accreditation

Sl.No.	Name of the Sector	Cat.
1.	Mining of minerals including Open cast/ Underground mining	A
2.	Offshore and onshore oil and gas exploration, development & productions	A
3.	River Valley, Hydel, Drainage & Irrigation projects	A
4.	Thermal power plants	A
5.	Nuclear power projects and processing of nuclear fuel	A
6.	Coal Washeries	A
7.	Mineral beneficiation including pelletisation	A
8.	Metallurgical industries - (ferrous &nonferrous) - both primary & secondary	A
9.	Cement plants	A
10.	Coke oven plants	A
11.	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive Areas including LNG terminal	A
12.	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)	B
13.	All ship breaking yards including ship breaking units	A
14.	Industrial estates/ parks/ complexes/ Areas, export processing zones(EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	A
15.	Ports, harbours, jetties, marine terminals, break waters and dredging	A
16.	Highways, Railways, transport terminals, mass rapid transport systems	A
17.	Townships and Area development projects	B

Name of approved EIA Coordinators and Functional Area Experts are mentioned in SAAC minutes and RAAC minutes published on website dated March 2, 2016 and Oct 14, 2015 respectively.

Accreditation to the above is subject to the EIA reports being prepared by the experts (EIA Coordinators and Functional area Expert) mentioned in the above minutes and compliance to the Terms and Conditions of Accreditation

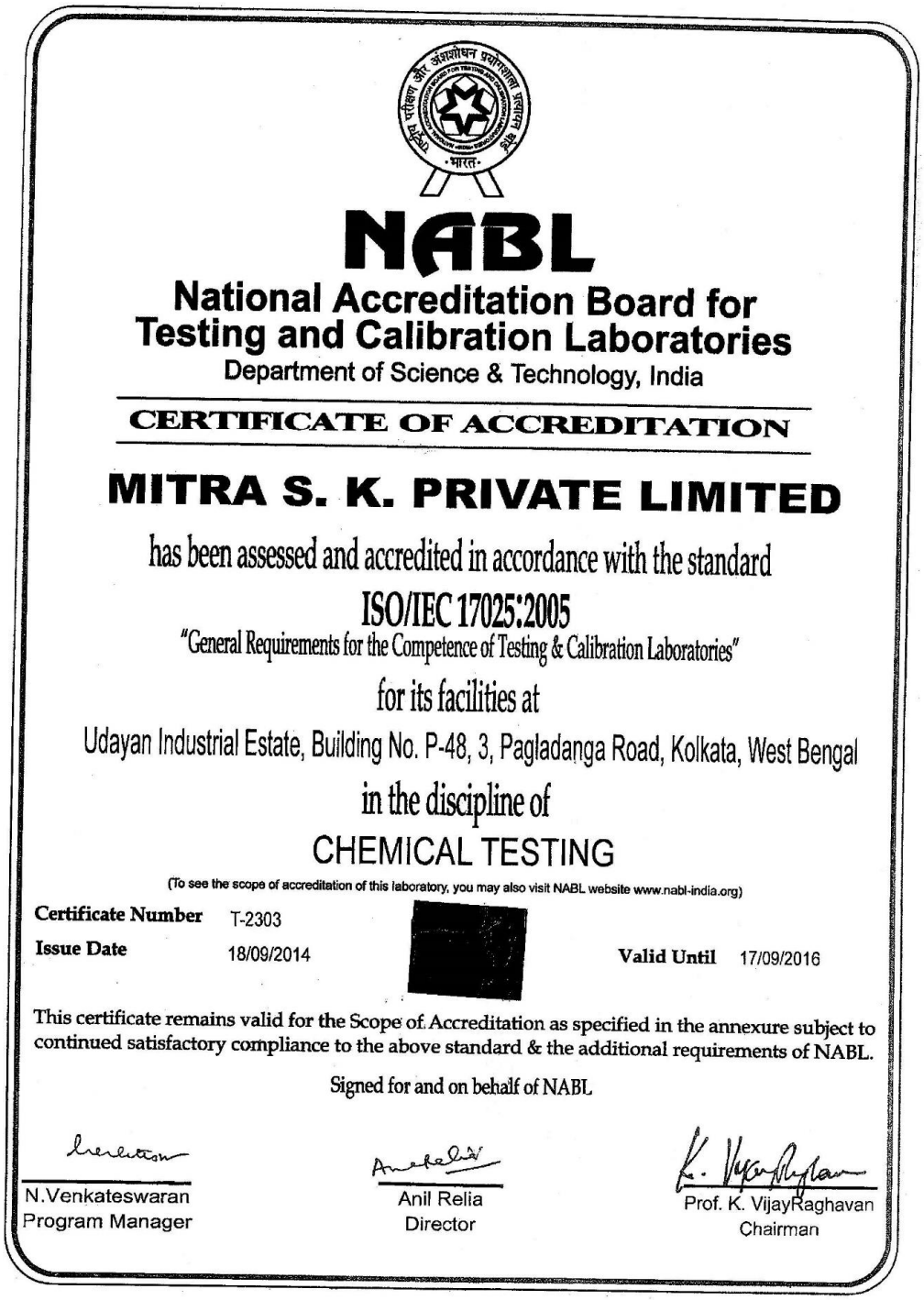
Certificate No: NABET/ EIA/1417 / SA 007

Valid Up to: February 4, 2017

(Subject to continual compliance to NABET scheme)

C.E.O - NABET

Annexure 11.2: NABL Accreditation Certificate of M/S Mitra S.K. Pvt. Ltd.



NABL

National Accreditation Board for Testing and Calibration Laboratories

Department of Science & Technology, India

CERTIFICATE OF ACCREDITATION

MITRA S. K. PRIVATE LIMITED

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2005

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

Udayan Industrial Estate, Building No. P-48, 3, Pagladanga Road, Kolkata, West Bengal

in the discipline of

CHEMICAL TESTING

(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Certificate Number T-2303

Issue Date 18/09/2014

Valid Until 17/09/2016

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the additional requirements of NABL.

Signed for and on behalf of NABL

N.Venkateswaran
Program Manager

Anil Relia
Director

Prof. K. VijayRaghavan
Chairman

Page 1 of 1

Annexure 11.3: NABET Accreditation Certificate of M/s Terracon Ecotech Pvt. Ltd.

National Accreditation Board
for Education and Training

June 17, 2013

The Director
Terracon Ecotech Private Limited
6th Floor, 'Swagat', Shraddhanand Road,
Vile Parle (East), Mumbai – 400057
(Kind Attention: **Dr. Ramesh Madav**)

Dear Sir,

QCI – NABET Scheme for Accreditation of EIA Consultant Organization

This is with reference to your application to QCI – NABET for Accreditation as EIA Consultant Organization.

We are pleased to inform you that based on Document & Office Assessments, the Accreditation Committee has recommended provisional accreditation of your organization as per the scope given in **Annexure I and II.** Also find attached herewith the following:

a. Detailed terms & conditions of accreditation **(Annexure III).**
b. Results of various aspects of assessment of your organization **(Annexure IV).**
c. The format which is to be followed for mentioning the names of the experts involved in the EIA reports prepared by you **(Annexure V).**

Please confirm the correctness of spellings of the names of the experts mentioned in Annexure II. Please check the QCI website for the Minutes of the Accreditation Committee Meetings held on February 18 and May 28, 2013 for observations related to your application for compliance. You are also advised to visit QCI website to check clarifications on the Scheme issued from time to time for necessary actions at your end.

The accreditation of your organization will be for a period of three years starting January 19, 2013. The annual renewal of the accreditation will be confirmed after surveillance assessment. Surveillance assessments will be conducted to ensure compliance with NABET Scheme including the details mentioned in your Quality Manual and the terms & conditions mentioned in Annexure III.

May we request you for an early payment of the annual fees and your confirmation of acceptance of the terms and conditions attached. This will enable us to issue you the requisite accreditation certificate.

We thank you for your esteemed support in making this scheme successful and for your participation in this national cause.

Thanks and best regards,

Yours sincerely,

(Vipin Sahni)
C.E.O.

Institution of Engineers Building, 2nd Floor, Bahadur Shah Zafar Marg, New Delhi - 110 002, India
Tel. : +91-11-2337 9321, 2337 8057 Fax : +91-11-2337 8678 e-mail : nabet@qcin.org Website : www.qcin.org

QUESTIONNAIRE FOR ENVIRONMENTAL APPRAISAL

QUESTIONNAIRE FOR ENVIRONMENTAL APPRAISAL

(INDUSTRY SECTOR PROJECTS)

Note 1 :	All information given in the form of annexures should be part of this file itself. Annexures as separate files will not be accepted.
Note 2 :	Please enter x in appropriate box where answer is Yes/No

I. General Information

A. Name of the Project : *Alang – Sosiya Ship Recycling Yard*

1. Existing project/proposed project/ expansion project/modernization project : *Upgradation and Expansion*

2. If Existing/expansion/ modernization project, whether environmental clearance has been obtained : *Applying for Environmental Clearance from MoEFCC for 1st time*

B. Plant Capacity (TPA) :

Existing: ~400 ships per year. Recovery - ~4 Mt/yr
Proposed: ~600 ships per year. Recovery - ~5.5 Mt/yr

C. Location

Villages	Tehsil	District	State
Alang, Sosiya, Mathavda, Manar	*Talaja*	*Bhavnagar*	*Gujarat*

D. Geographical Information

1. Latitude

Existing: 21°26'26" N to 21°22'36.4"N.
Proposed: Will be extended southwards to 21°21'40.5"N

2. Longitude

Existing: 72°13'31.2" E to 72°10'01.2"N.
Proposed: Will be extended westwards to 72°09'23.3"E

3. Elevation above Mean Sea Level (metres) — At Sea Level

4. Total Area envisaged for setting up of project (in ha.) — *~210*

5. Nature of terrain (hilly, valley, plains, Coastal plains etc.) — *Beach & Coastal Plain*

6. Nature of Soil (sandy, clayey, sandy loam etc.). — *Sandy*

7. Permeability (cm/sec) — *0.0073*

E. Alternate sites considered

1. *2 sites considered for location of dry-dock; At southern end of existing yard & and at northern end of existing yard. Southern end of existing yard selected .*
2. _____

F. Reasons for selecting the proposed site based on comparative evaluation of environmental considerations.

	Northern End of Existing Yard	**Southern End of Existing Yard**
Advantages	*(i) 10 m contour near shore* *(ii) Not prone to wave actions* *(iii) Small Dredging Required* *(iv) Cost effective*	*(i) Not prone to wave actions due to the presence of Sultanpur / Gopnath shoals* *(ii) Not prone to siltation* *(iii) Less maintenance dredging* *(iv) The shoreline is wider and flatter*
Disadvantages	*(i) Site in the vicinity of River Manari* *(ii) Any structure in the river mouth itself is vulnerable location to flood/ erosion/siltation and obstructing the natural flow during monsoon*	*(v) Considerable Capital Dredging Required*

II. Environmental Setting

A. Current land usage of the proposed project site Area (in hectares) .

1. Notified Industrial Area/Estate	*~210*
2. Agricultural	
Irrigated	*Nil*
Unirrigated	*Nil*
3. Homestead	*Nil*
4. Forest	*Nil*
5. Grazing	*Nil*
6. Fallow	*Nil*
7. Marshy	*Nil*
8. Mangroves	*Nil*

9. Others (Pl. specify)	*Nil*
Total	*~210*

B. Please indicate area earmarked for each of the following (in ha.)

1.	Plant Facilities	*Existing : 39.8809* *Additional: 24.588*
2.	Ash Disposal	*Included In TSDF area*
3.	Storage (Fuel)	*Included*
4.	Storage (Water)	
5.	Storage (Hazardous Waste)	*Included*
6.	Storage (Hazardous Chemicals)	*Included*
7.	Storage (Others)	*Included*
8.	Approach Road(s)	*19.33*
9.	Township	*9,470*
10.	Green Belt	*6*
11.	Others (Please specify)	*TSDF: 7 ha* *Hospital:*
	Total	

C. Is the proposed site located in a low-lying area ?

Yes ☐ No

If yes,

1. Level before filling (above MSL, in metres) *0 m*
2. Level after filling (above MSL in metres) *3m max.*

Quantity of Fill Material required (in cum.)	Source
	Dredge spoils generated from construction of offshore dry-docks with necessary approach channels

D. Proximity to sea/water bodies :

	Sea	Other Water bodies like River/creek/lake etc. (Please specify)
Distance of site* boundary (in m)	*The ship recycling yard is located on the sea beach*	*Pasvivali Creek and Manari Creek cross the existing ship recycling yard*
Distance of plant facilities (in m)		

*** From highest flood line/high tide line**

E. Whether any of the following exist within 7 km. of the periphery of the project site. If so, please indicate aerial distance and the name of the eco-system as given under the Table.

S.No.		Name	Area falling within 7 km periphery of project (ha.)	Aerial Distance (in km.)
1	National Park/Wildlife Sanctuary	*None*		-
2	Tiger Reserve/Elephant Reserve / Turtle Nesting Ground	*None*		-
3	Core Zone of Biosphere Reserve	*None*		-
4	Habitat for migratory birds	*None*		-
5	Lakes/Reservoir/Dams	*None*		-
6	Stream/Rivers	*Pasvivali Manar*		*Both these cross the yard*
7	Estuary/Sea	*Gulf of Khambat*	1609690 ha (~160.97 km^2)	*Project located on sea-shore*
8	Mangroves	*None*		-
9	Mountains/Hills	*None*		-
10	Notified Archaeological sites	*None*		-
11	Any other Archaeological sites	*None*		-
12	Industries/Thermal Power Plants	*None*		-
13	Defence Installation	*None*		-
14	Airports	*None*		-
15	Railway Lines*	*None*		-
16	National / State Highways*	*NH-8E SH-37*		*7.9 km 1.2 km*

*** 0.5 km from Railway lines/National / State Highway should be maintained.**

F. Description of the flora/vegetation within 7 km under following headings.

1. Agricultural crops : *Wheat, Grams, Sorghum, Pigeon peas*

2. Commercial crops : *Cotton, Sugarcane, ground-nut, chillies, onions, garlic*

3. Plantation : *Banana, Mango, Sapota*

4. Natural Vegetation/Forest Type : *Open Scrub*

5. Grass Lands : *Present*

6. Endangered species : *None*

7. Endemic species : *None*

8. Others (Please Specify) : *Refer Annexure 1 for detailed list of study area flora*

G. Description of fauna (non-domesticated) within 7 km under following headings.

1. Total listing of faunal elements: *Refer Annexure 2*

2. Endemic fauna species: *None*

3. Endangered Species: *None*

4. Migratory species: *Painted storks, ibises*

5. Route of migratory species of birds and mammals:

6. Details of aquatic fauna (if applicable): *Refer Annexure 2*

III. Meteorological Parameters

A. Seasonal – Monitoring Data (continuous monitoring for one full season except monsoon should be carried out)

1. Temperature (in ^{0}C)
(a) Maximum: *36.7^{0}C* (b) Minimum: *22.0^{0}C* (c) Mean: *29.7^{0}C*

2. Rain fall (in mm): *4.8 mm*
(a) Maximum: *3.8 mm* (b) Minimum_____ (c) Mean_____

3. Mean value of humidity (in %): *61.3%*

4. Inversion occurrence

(a) In percentage (b) Height in meters

5. Seasonal Wind-rose pattern (16 points on compass scale): *Refer Annexure 3*

6. Hourly Mean Meteorological data (based on one full season data collected at site required as input for air quality modeling)

Hour	Low/Medium Cloud amount (in OCTAS)	Wind Speed in (Km/h)	Predominant wind direction (*in Degrees*)	Ambient air temperature (in deg K)	Hourly stability	Mixing depth (in m)	Relative humidity (%)
0100		*4*	*96*	*32.9*			*31.6*
0200		*1*	*142*	*31.1*			*59.2*
0300		*0*	*194*	*30.1*			*55.3*
0400		*1*	*39*	*29.4*			*72.8*
0500		*1*	*173*	*29*			*73.6*
0600		*0*	*194*	*27.6*			*72.8*
0700		*1*	*196*	*26.6*			*61.2*
0800		*1*	*206*	*26.4*			*56.6*
0900		*3*	*177*	*28*			*53.2*
1000		*1*	*127*	*30.9*			*39.5*
1100		*1*	*134*	*32.2*			*45.4*
1200		*1*	*120*	*33.7*			*33.5*
1300		*8*	*111*	*34.3*			*38.1*
1400		*9*	*224*	*33.4*			*56.3*
1500		*4*	*125*	*33.8*			*51.9*
1600		*4*	*131*	*34.4*			*51.7*
1700		*6*	*160*	*33.4*			*51.2*
1800		*4*	*146*	*33.5*			*54.3*
1900		*6*	*152*	*32.8*			*52.9*
2000		*3*	*132*	*32.2*			*54.7*
2100		*3*	*120*	*31.4*			*65.2*
2200		*4*	*141*	*30.7*			*71.5*
2300		*4*	*160*	*30.4*			*76.1*
2400		*1*	*149*	*29.9*			*82.1*

Attach additional sheet as required.

IV. Ambient Air Quality Data

[Frequency of Monitoring should be as per guidelines of CPCB and monitoring should cover one full season (excluding monsoon)]

A. Season and period for which monitoring has been carried out: *Summer (March – May) 2015*

B. Frequency of sampling: *24 hourly samples, twice a week for 12 weeks*

C. Number of samples collected at each site.: *24*

Date, Time & Location	Wind direction & Speed	24 hourly Concentration as monitored (in $\mu g/m^3$.) SPM, RPM, SO_2,Nox,CO	Permissible Standard(As per EPA/SPCB consent)	Remarks (Name of the instrument and sensitivity)

D. 24 hourly concentrations (in $\mu g/m^3$)

Pollutant(s)	Maximum	Minimum	Mean	98%
SPM				
RPM				
SO_2				
NOx				
CO				

Summarised Ambient Air Quality Monitoring Results

Name of monitoring equipment used	**PM_{10} ($\mu g/m^3$)**			**$PM_{2.5}$ ($\mu g/m^3$)**			**SO_2 ($\mu g/m^3$)**			**NOx ($\mu g/m^3$)**			**CO (mg/m^3)**		
	Respirable Dust Sampler (RDS)			**$PM_{2.5}$ Dust Sampler**			**RDS & Spectro-photometer**			**RDS & Spectro-photometer**			**NDIR Method**		
Equipment sensitivity	**Detection Limit: 1 $\mu g/m^3$**			**Detection Limit: 1 $\mu g/m^3$**			**Detection Limit: 4 $\mu g/m^3$**			**Detection Limit: 10 $\mu g/m^3$**			**Detection Limit: 0.057 mg/m^3**		
AAQ monitoring stations	**Max.**	**Min.**	**C_{98}**	**Max.**	**Min.**	**C_{98}**	**Max.**	**Min.**	**C_{98}**	**Max.**	**Min.**	**C_{98}**	**Max.**	**Min.**	**C_{98}**
Alang Fire Station	114	56	98	63	26	58	11.2	4.5	9.6	45.5	20.2	44.0	1.32	0.08	1.06
Alang Village	111	48	98	66	22	58	10.5	4.5	10.2	32.2	12.2	32.2	0.99	0.08	0.80
Sosiya Village	98	45	97	56	23	55	9.6	4.2	9.6	34.5	12.2	31.2	0.88	0.07	0.82
Mathavda	94	31	87	45	14	44	9.2	4.2	8.5	34.8	13.1	31.2	0.99	0.06	0.75
Kathava Village	97	48	96	52	22	50	8.5	4.5	7.9	30.2	14.2	27.5	0.92	0.06	0.75

Detailed Date-wise AAQ data given in Annexure - 4

E. Specific air pollution issues in the project area.

- *Fugitive emissions of dust and NOx.*
- *Emissions on account of incineration of wastes.*

V. Manufacturing Process details

A. Raw materials (including process chemicals, catalysts, & additives).

List of raw materials to be used at all stages of manufacture	**'Physical and chemical nature of raw material**	**'Quantity (tonnes/month) full production capacity**	**Source of materials**	**Means of transportation (Source to storage site) with justification**
LPG	*Flammable Gas liquefied under pressure*	*1835 t*		*In 19 kg cylinders. By trucks from source to site.*
Oxygen	*Compressed gas*	*8.25×10^6 Nm^3*		*In cylinders. By trucks from source to site.*

B. Brief description of the process :

Ships are grounded on the beach (i.e. beached) during high tides usually with the bows forward. The grounded ships are lightened by discharge of water ballast. The lightened ships are winched towards shore during subsequent high tides. After removal of fuel, lubricants and detachable / removable items the ships are cut up into large pieces using LPG-Oxygen torches. The large pieces are winched on to dry land and cut up into smaller marketable pieces sorted and despatched to the market. As the ship is cut up it gets lighter and is further winched shore-wards. The engine room is cut up last.

After upgradation of the yard, it is expected that about 10% of the ships will be docked in the 2 dry-docks which will be constructed for removal of fuel, lubricants and hazardous materials. These decontaminated ships will be undocked, beached and cut up like other ships.

C. Details of process technology know how/collaboration :

D. Production profile (tonnes/year)

Name of Products, Byproducts and Intermediate Products	Existing	Proposed activity (new / modernization / expansion)	Total
A. Main Products 1. *Steel Scrap*	*~3,600,000*	*~1,800,000*	*~5,400,000*
B. By-Products 1. *Refer Annexure - 5*	*~400,000*	*~200,000*	*~600,000*
C. Intermediate Products 1.			

D. Means of transportation of raw material and final products

Means of Transport	Raw material (in TPA)	Final Product (in TPA)
1. Road	*LPG: 22000 t* *Oxygen: 99 x 10^6 Nm^3*	*~6,000,000*
2. Rail	*Nil*	*Nil*
3. Pipeline	*Nil*	*Nil*
4. Others, (*Sea**)	*~6,000,000**	*Nil*

**Ships which will be recycled will come by sea*

VI. Water

A. Water Requirement (cum/day)

Purpose	Avg. Demand	Peak Demand	Source	Type Treated / untreated/Fresh/ Recycled	Remarks
1. Project					
(i) Process	*294*	*305*	*Public Supply + Recycled*	*Fresh (41) + Recycled (264)*	
(ii) Cooling water	*N.A.*	*N.A.*	*N.A.*	*N.A.*	
(iii) DM water	*N.A.*	*N.A.*	*N.A.*	*N.A.*	
(iv) Dust Suppression	*1400*	*1665*	*Sea water / ETP*	*Untreated / Recycled*	
(v) Drinking	*2000*	*2400*	*Public Supply*	*Fresh*	
(vi) Green Belt	*5*	*10*	*STP*	*Treated sewage*	
(vii) Fire Service	-	*2000*	*Sea / STP*	*Untreated*	
(viii) Others	-	-	-	-	
2. Township					
(i) Green Belt	*11*	*30*	*STP*	*Treated sewage*	
(ii) Drinking	*3250*	*3750*	*Public Supply*	*Fresh*	
(iii) Others (Please specify)					
TOTAL	*7060*	*8190 + 2000*			

B. Source of Raw Water Supply

S.No.	Source	Cu.m./hr	Cu.m./day
1	Sea		1729
2	River		
3	Groundwater		1400
4	Other surface water bodies (*Supplied by Gujarat Water Supply & Sewerage Board*)		4991

C. Lean Season flow in case of surface water source (cusecs/cumecs) : *Not Applicable*

D. Groundwater (a) Recharge Rate/Withdrawal rate

1. Ground water level (metres)

(i) Premonsoon

(ii) Postmonsoon

(to be obtained from Central/State Ground water authorities)

E. Competing Users of the Water Source :

S.No.	Usage	Present Consumption (cu.m/day)		Addition Proposed as per local plan		Total	
		Surface	Ground	Surface	Ground	Surface	Ground
1	Irrigation						
2	Industry						
3	Drinking						
4	Others (Please specify)						
	Total						

E. Physico- chemical analysis of Raw Water at intake point:

F. Physico- c hemical analysis of treated water to be used in project/township.

Will conform to limits specified in IS:10500 (2012)

H. Waste Water Management

1. Description of waste water treatment plan with flow chart
2. Characteristics of discharge stream(s) before and after treatment

Item	Characteristics	
	Before	After
	Refer Annexure 6	

3. Daily discharge (m^3/day) from different sources

(a) Plant operation	*65*
(b) Workshop	*Not Applicable*
(c) D.M. Plant effluent	*Not Applicable*
(d) Domestic	*4900*
(e) Other (specify)	*Quantity of effluent discharged from ships varies greatly from few hundred m^3 to several thousand m^3 depending on the size and type of ship.*
Total	*4965*

4. Quantity of water recycled

(a) (in %)	*~22%*
(b) (in cum/day)	*~1100*

5. Details of recycling mechanism

6. Mode of final discharge/disposal of treated effluent :

Mode	Length (in m.)	Quantity(in m^3/day)
(i) Open Channel		-
(ii) Pipeline		*1940*
(iii) Others (*Sep*tic tanks & *Soak pits*)		*1925*
Total		*3865*

7. Point of final discharge :

Final Point	Quantity discharged (in m^3/day)
(i) Green belt within the plant/township	*32*
(ii) Agricultural land	
(iii) Fallow Land	*1000*
(iv) Forest Land	*Not Applicable*
(v) River/Stream	
(vi) Lake	*Not Applicable*
(vii) Estuary	*Not Applicable*
(viii) Sea	*1000 m^3/day unutilised treated sewage + effluents from ships (Quantity of effluent discharged from ships varies greatly from few hundred m^3 to several thousand m^3 depending on the size and type of ship).*
Total	*2032 m^3/day + effluents from ships*

8. Lean season flow rate in case of discharge in a river/stream (cusecs)

Not Applicable

9. Downstream users of water (in case of river, reservoir, lake(cusecs)

Not Applicable

(a) Human
(b) Irrigation
(c) Industry
(d) Others (Pl. specify)

10. Analysis of river water 100 metres upstream of discharge point and 100 metres downstream of discharge point (except in rainy/monsoon season) along with details of aquatic life.

Not Applicable

11. What is the predicted impact on water quality of the receiving body due to discharge ? (Briefly state the prediction tool adopted)

VII. Solid Waste Management

1. Details

S.No	Source	Qty(TPM)	Form (Sludge/Dry/Slurry etc.)	Composition
.1	Raw water treatment plant	*Not Applicable*		
2	ETP		Sludge	Biomass
3	Process	*1370*	*Dry*	*Refer Annexure 7*
4	Spent Catalyst	*Not Applicable*		
5	Oily Sludge	*Variable*	*Sludge*	*Furnace oil sludge*
6	Others (Pl. Specify)			

B. If waste(s) contain any hazardous/toxic substance/radioactive materials or heavy metals, provide data and proposed precautionary measures.

Hazardous wastes generated from the ship recycling yard include Asbestos & asbestos containing material (ACM), paint chips (containing lead, chromium, copper, cadmium, zinc, tin & poly chlorinated biphenyls), waste electrical cable insulation (containing poly chlorinated biphenyls), damaged (unsalvageable) electrical and / or electronic components (e-wastes), sludge from fuel tanks & oil sumps, glass wool, instruments containing radioactive isotopes etc.

Before beaching, the ship's captain has to submit a detailed list of wastes remaining on board. This list also gives the list of instruments containing radioactive isotopes.

Instruments containing radioactive isotopes are dismantled and disposed off as per Atomic Energy Regulatory Board guidelines under the supervision of GMB's Radiological Safety Officer.

Asbestos and ACM are removed after thorough wetting by team(s) of specially trained workers wearing full body protective clothing with breathing apparatus. The

removed asbestos and ACM are packed in leak proof labeled containers which are then taken to the dedicated TSDF attached to the yard, dumped in a special masonry pit and cemented over.

All wastes are segregated at the plots and packed in labeled containers. The wastes are transported to the dedicated TSDF for disposal. At the TSDF wastes suitable for incineration are incinerated in a dual chamber high temperature incinerator. Other wastes are dumped in landfills. There are separate landfills for hazardous wastes (70,000 m^3 capacity) and non hazardous wastes (30,000 m^3 capacity). The landfills have impervious lining. There are also arrangement for collection of leachates which are treated in the TSDF's ETP.

C. What are the possibilities of recovery and recycling of wastes?

The project recycles decommissioned ships. Only materials which cannot be reused or recycled as discarded as wastes.

D. Possible users of Solid Waste (s).: *Refer VII C above*

E. Method of disposal of solid waste (s)

	Method	Qty(TPM)
1.	Landfill	*~1192**
2.	Incineration	*~178**
3.	Recovery	*Refer VII C above*
4.	Downstream users	*Refer VII C above*

**Estimated on the basis waste characteristics during 2006 – 2013. During this period ~87% of wastes dumped in landfills & ~13% incinerated.*

F. In case of landfill

1. Is solid waste amenable for landfill YES ☐ NO ☐
2. Dimensions of landfill ☐ ☐ ☐

There are 2 separate landfill; 1 for hazardous wastes (cap. 70000 m^3) and 1 for non-hazardous wastes and municipal solid wastes (cap. 30000 m^3).

3. Life of landfill *15 yrs.* years
4. Proposed precautionary and mitigative measures along with design features

Both the landfills have a bottom liner as well as side liner.

For the MSW landfill the Bottom Liner is a single layer system comprising of:

- *300 mm thick drainage layer of permeability 1 x 10^{-2} cm/second.*
- *1.5 mm thick HDPE liner*
- *900 mm thick compacted clay / amended soil of permeability 1 x 10^{-7} cm/second.*

For the hazardous waste landfill the Bottom Liner comprises of:

- *2 nos. 300 mm thick drainage layer of permeability 1 x 10^{-2} cm/second.*
- *2 layers of 1.5 mm thick HDPE liner*
- *2 layers of 450 mm thick compacted clay / amended soil of permeability 1 x 10^{-7} cm/second.*

The cross section of the bottom liner of hazardous waste landfill is as follows:

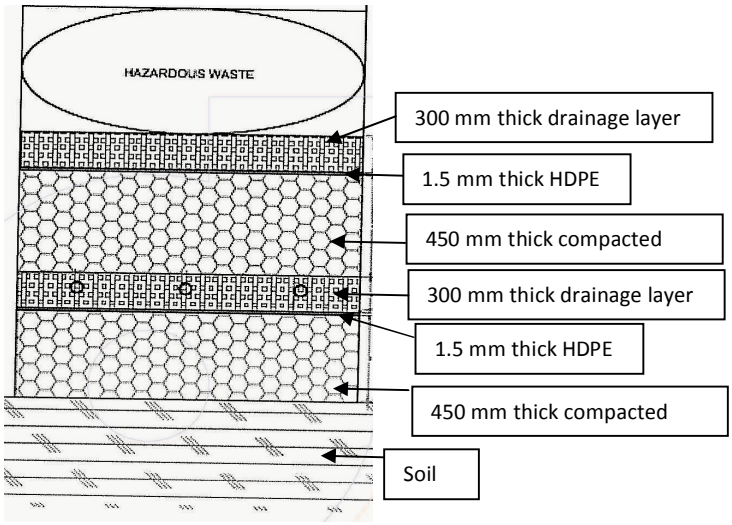


Fig.: Section of Bottom Liner of Hazardous Waste Landfill

The side liner comprises of 300 mm thick compacted clay and 1.5 mm thick HDPE. The bottom liner also has 150 mm diameter perforated pipes for collection of leachates. The pipes are sloped towards a collection well where the leachates collect and are pumped to the ETP.

At the end of the landfill's life the wastes will be covered with a layer of HDPE followed by a thick layer of soil. Grasses and shrubs will be planted on the soil.

G In case of incineration:

1. Details of incinerator

(i) Type: *Dual Chamber Type*

(ii) Size: *Existing 5 t/day cap. New 25 t/day cap. incinerator proposed*.

(iii) Capacity: *Existing 5 tonnes per day. New Incinerator of 25 tonnes per day proposed.*

(iv) Fuel: *LDO (for start-up)*

2. Likely composition and quantum of emissions

S.No.	Composition	Quantity (in cu.m/hr)
1	*PM_{10} – 50 mg/Nm^3; SO_2 – 75.5 mg/Nm^3 NOx – 140 mg/Nm^3*	*37490*

VIII. Noise Pollution Control and Management

Operation of diesel powered winches, cranes & other material handling equipment, handling of pieces of heavy metal some weighing several tonnes, movement of trucks

A. Source

B. Level at Source (dB) — *90 dB(A) max.*

C. Level at project boundary Capacity (dB) — *85 dB(A) at plot boundary*

D. Abatement measures (give source-wise details)

- *Diesel powered machinery, which are major source of noise in scrap yards, will be properly maintained as per maintenance schedule to prevent undesirable noise. Attention shall be paid towards rigorous maintenance of the silencers of diesel engines*
- *Static diesel engines will be housed as far as possible (not made of sheet metals) or surrounded by baffles. Wherever possible they will be placed on vibration isolators.*
- *Crane operators and winch operators are issued earmuffs. Wearing personal protective equipment is compulsory and the Safety Officer / Supervisor of each plot shall carry out regular inspections to this effect. Duty hours of operators of noisy machinery may be regulated to keep their noise exposure levels within limits.*
- *Dispatch of materials by trucks will be regulated such that, the traffic is evenly distributed. This will avoid congestion and consequent excessive noise and vehicular emissions.*

IX. Fuel/Energy Requirements

A. Total Power Requirement (MW)

	Project	Township	Other(pl.specify)	Total
Present (in existing)	*1.35*	-	-	*1.35*
Proposed	*1.65*	*3.0*	-	*4.0 #*
Total	*3.0*	*3.0*	-	*4.0 #*
# Most work at project during day time only. Dry docks may function round the clock.				

B.. Source of Power (MW)

	SEB/Grid	Captive power plant	DG Sets
Present	*1.35*	*Nil*	*Emergency power only on each plot*
Proposed	*4.0*	*Nil*	
Total	*4.0*	*Nil*	

C. Details of Fuel used

Sl. No.	Fuel	Daily Consumption (TPD)		Calorific value (Kcals/kg)	% Ash	% Sulphur
		Existing	Proposed			
1	Gas *(LPG)*	*54 **	*74 **	*11900*	*Nil*	*0.015 max.*
2	Naptha	*Nil*	*Nil*			
3	HSD	*6.7 #*	*9.2 #*	*10600 - 11300*	*0.10 max.*	*0.25*
4	Fuel Oil *(LDO)*	*0.01*	*0.02*	*10700*	*0.02 max.*	*1.5 max.*
5	Coal	*Nil*	*Nil*			
6	Lignite	*Nil*	*Nil*			
7	Other (Pl. specify	*Nil*	*Nil*			

**Present annual LPG consumption 16000 t/yr; Expected to increase to 22000 t/yr.*
#Present HSD consumption 2000 KL/yr; Expected to increase to 2750 KL/yr.
$Present LDO Consumption 3.36 KL/yr; Expected to increase to 7 KL/yr.

D. Source of Fuel (Distance in km)

1. Port	
2. Mine	
3. Refinery	
4. Storage depot/Terminal	*~60*

E. Mode of Transportation of fuel to site

1. Trucks (numbers/day)	*~12 at present.*
2. Pipeline(length in km.)	*Nil*
3. Railway Wagons (numbers/day)	*Nil*

X. Atmospheric Emissions

A. Flue gas characteristics(SPM, SO_2, NO_x, CO)

S.No.	Pollutant	Source of Emission	Emission rate (kg/hr)	Concentration in flue gas (g/m^3)
1	SPM	*Existing 5 t/d incinerator*		*Results obtained from on-line flue gas monitoring system installed on incinerator stack enclosed as Annexure 8.*
2	RPM			
3	SO_2			
4	NOx			
5	CO			

B. Size distribution of SPM at the top of the stack

S.No.	Range	% by weight

1	Micron	
2	1-10 Micron	
3	10-20 Micron	
4	<20 Micron	

C. Stack emission Details (All the stacks attached to process units, Boilers, captive power plant, D.G. Sets, Incinerator both for existing and proposed activity).

Plant section & units*	Stack No.	Height from ground level (m)	Internal Diameter (Top) (m)	Emission Rate (kg/hr)*	Temp. of Exhaust Gases (deg K)	Exit Velocity (m/sec)	Exhaust Gas			
							Temp	Density	Specific Heat	Volumetric Flow (m^3/hr)
Incinerator	*1*	*32*	*0.5*	*Dust – 0.1* *SO_2 – 0.34* *NOx – 1.12* *Cl_2- 0.006*	*301*	*10.6*	*301*			*7500*

*Note: Please indicate the specific section to which the stack is attached. For e.g.: Process section, D.G. Set, Boiler, Power Plant, incinerator etc.
Emission rate (kg/hr.) for each pollutant (SPM, SO_2, NO_x etc. should be specified.

D. Details of fugitive emissions (Indicate the points of fugitive emissions and quantities estimated)

- *Fugitive dust from roads.*
- *Fugitive emissions of NOx from LPG burning from entire yard (87230 kg/yr = ~290.8 kg/d avg.)*
- *Fugitive emissions of NOx from diesel powered machinery from entire yard*

E. Predicted impact on air quality (as per CPCB Guidelines for conducting the air quality modelling)

The prediction of Ground level concentrations (GLC) of pollutants emitted from all the sources have been carried out using AERMOD Air Quality Simulation model released by USEPA. The impact has been predicted over a 10 km X 10 km area with the proposed location of the stack as the center. GLCs have been calculated at every 500 m grid point. In the present study, GLCs are predicted for 24hrs averages. The anticipated emissions from the proposed incinerator have been computed based on the present performance of the existing actual stack monitoring results. For estimating SO_2 and NOx emission rate from the proposed incinerator, max values of emissions as per the audit report (July-Dec, 2014) have been taken. The Isopleths of PM_{10}, SO_2 and NOx for the future scenario are presented in Annexure - 8. Maximum values of the background concentration are taken and added to the predicted values at the respective stations to predict future scenario are also given in Annexure - 9.

XI. Pollution load statement (Applicable to Expansion and Modernization Projects only)

Parameter	Existing Plant	Proposed Expansion/Modernization	Total	Remarks
1. Land area (ha)				
2. Raw water (m^3/day)	*4000*	*4190*	*8190*	
3. Power (MW)	*1.35*	*2.65*	*4.0*	*Max. Demand*
4. Waste water (effluent generation) (m^3/day)				
a. Process	*30*	*35*	*65*	
b. Domestic	*1600*	*3300*	*4900*	
5. Air emissions (gms/hr.)				
a. SPM	*~340*	*~1700*	*~2040*	
b. CO				
c. SO_2	*~511*	*~2556*	*~3067*	
d. NOx	*~27400*	*~14660*	*~42050*	
e. Others (like HC, Cl_2, NH_3 etc.)				
6. Hazardous Chemical Storage (*LPG*)	*160 t*	*60 t*	*220 t*	
7. Solid waste (TPD)				
a. Non- Hazardous	*~3.5*	*~1.7*	*~5.2*	
b. Hazardous	*~33.0*	*~17.0*	*~50.0*	

XII. Storage of chemicals (inflammable/explosive/hazardous/toxic substances)

S. No	Name	Number of Storage's	Capacity (TPD)	Physical and Chemical Composition	Consumption (in TPD)	Maximum Quantity of storage at any point of time	Source of Supply	Means of transport-ation
1	*LPG*	*1 or 2 on each plot*	*Existing - ~160 t Proposed - ~220 t*	*Gas liquified under pressure; Propane + Butane*	*Existing - ~53 t/d Proposed - ~73 t/d*	*Existing - ~160 t Proposed - ~220 t*	*LPG bottling plants*	*By trucks in 19 kg cylinders*

XIII. Occupational Health and Industrial Hygiene. :

A. What are the major occupational health and safety hazards anticipated. (Explain briefly).

The principal occupational risks in ship recycling are:

- *Failure of winches and / or snapping of winching lines during ship-winching*
- *Asbestos exposure*

- ❖ *Fire and explosion*
- ❖ *Inhalation of toxic gasses*
- ❖ *Working in confined spaces where suffocating / toxic / inflammable gases may be present*
- ❖ *Accidents involving falling of material from height*
- ❖ *Accidents involving fall from height*
- ❖ *Accidents during metal cutting*
- ❖ *Diseases due to dust inhalation*
- ❖ *Hearing loss*
- ❖ *Accidents involving material handling equipment during*
  - *Carrying of big pieces of ship to the plot*
  - *Separating parts other than metals from the ship*
  - *While loading and unloading of LPG and Oxygen Cylinders*
  - *Carrying of heavy material from one place to another*
  - *While removing furniture from the ship*
  - *While sorting the scrap*

B. What provisions have been made/propose to be made to conform to health/safety requirements. (Explain briefly).

Refer Annexure 10

C. Details of personal protective equipment provided/to be provided to the workers.

- *No worker carries mobile phone to his work place lest he be distracted by attending to phone calls while working.*
- *All workers and visitors wear safety helmets in working areas*
- *All workers wear safety boots.*
- *All workers engaged in gas cutting wear welders' goggles, gloves and masks*
- *Workers engaged in abrasive work, wear goggles and masks*
- *Workers engaged in handling heavy items and glass wear gloves.*
- *Operators of heavy diesel powered machinery are issued ear plugs / ear muffs.*
- *Enclosed spaces on board the ships are MADE free of flammable, suffocating and toxic gases / vapours. If any such gases are present in concentrations which may pose a threat to workers' safety, the spaces shall be purged with air till they are safe for entry of workers and for working.*
- *Nobody is smoking or there is any open flame nearby when fuel is being unloaded from ships.*
- *There are adequate number of fire fighting systems on the plots and they are in working order.*
- *Heavy material handling machinery give audio-visual warnings while moving heavy loads.*
- *Life buoys are kept on ships for use during emergency evacuation in case of major fire*

- *Workers working at heights are provided with safety belts / harnesses.*
- *All other general safety rules and guidelines are followed.*
- *Asbestos removal shall be carried out by workers wearing full body clothing with facemasks and breathing apparatus under the supervision of a trained Asbestos Removal Supervisor.*

D. Details of proposed measures for control of fugitive emission/odour nuisance from different sources.

E. Details of fire protection and safety measures envisaged to take care of fire and explosion hazards.

At the project, it is mandatory that all tankers' / gas carriers' cargo tanks and pipelines are purged with inert gas, using on-board inert gas generating systems, prior to the ship being allowed to be beached. Prior to cutting, Hot Work Certificate has to be obtained from the concerned authorities who ensure that no flammable gases or liquids are remaining on board.

On board the ships, sufficient numbers of portable fire extinguishers are kept ready near operations involving flammable materials.

GMB has a dedicated FireFighting Department atAlang-Sosiya SRY equipped with following fire-fighting equipment:

- *2 nos. water browsers (each of 16 kl capacity)*
- *1 no. high pressure mini fire tender*
- *4 nos. multipurpose fire tenders*
- *2 nos. water tankers (each of 10 kl capacity)*
- *4 nos. fire proximity suits*
- *2 nos. breathing apparatus*
- *1 no. foam generator (small)*
- *2 nos. portable combined water-cum-foam monitors of 1700 l/minute capacity*

The Fire Fighting Department is headed by the Station Officer. At present 16 fire crew are on duty. 17 additional vacancies are being filled.

Individual plots have sufficient numbers of portable fire extinguishers. Major incidents will be dealt by GMB's fire department.

Workers engaged in cutting cargo tanks of oil / gas / chemical tankers may be exposed to flammable and / or toxic gases. To prevent the same, all such areas have to be made gas free prior to the ship being granted permission for beaching. Hot work certificate has also to be taken as part of the prior to cutting (Refer Chapter 2, Clause 2.6.3 and Annexure 2.3). Nevertheless, the atmosphere inside enclosed spaces is tested with gas meters for presence of explosive and toxic gas mixtures prior to workers entering such areas. This is especially important in cases where the spaces:

- *That have been sealed*
- *Spaces and adjacent spaces that contain or have contained combustible or flammable liquids or gases.*

- *Spaces and adjacent spaces that contain or have contained corrosive / toxic / irritant solids, liquids or gases.*
- *Spaces and adjacent spaces that have been fumigated.*
- *Confined spaces that have been freshly coated or painted.*

Workers are not allowed to work in confined spaces where the atmospheric oxygen content is less than 19.5% (by volume) or more than 22% (by volume) except for emergency rescue or for a short duration for installation of ventilation equipment necessary to start work in the space, provided:

- *No ignition sources are present*
- *The atmosphere in the space is monitored continuously*
- *Atmospheres at or above the Upper Explosive Limit (10% hydrocarbon content by volume) are maintained*
- *The workers are provided with respirators and other personal protective equipment*

If an enclosed space, whose atmosphere is considered unsafe, is found, the same is prominently labeled warning workers to stay away. The space is ventilated till:

- *Flammable vapour is maintained below 10% of lower explosive limit(1% hydrocarbon content by volume)*
- *Toxic, corrosive or irritant vapours are maintained within permissible exposure limits and below IDLH levels.*

While workers are working in enclosed spaces, heavy duty blowers may be used to ventilate the work areas and prevent buildup of gases generated due to LPG burning.

XIV. Pollution Control Aspects

A. Details of Pollution Control Systems :

S. No		Existing	Proposed to be installed
i)	Air	• *High temperature dual chamber incinerator* • *Venturi scrubber & wet scrubber for incinerator's flue gas system.* • *Fugitive dust suppression by water sprinkling.* • *Administrative measures to prevent open burning of wastes.* • *Special enclosure for dismantling of asbestos*	• *New High temperature dual chamber incinerator* • *Venturi scrubber & wet scrubber for new incinerator's flue gas system.* • *Fugitive dust suppression by water sprinkling* • *Administrative measures to prevent open burning of wastes*
ii)	Water	• *System for collection of effluents from ships* • *Effluent treatment plant* • *Soak pits for toilets* • *System for collection of leachates from landfills. Leachates pumped to ETP.* • *Recycling of scrubbing liquor from*	• *Paving of plots.* • *Plots' pavement to be sloped towards drains leading to settling pits provided with oil & grease traps.* • *Dry-docks for decontamination of ships* • *Additional effluent treatment plant.* • *Sewage treatment plant for workers'*

S. No		Existing	Proposed to be installed
		incinerator's flue gas scrubbing system.	*colony*
Iii)	Noise	*Ear plugs and ear-muffs for operators of noisy machinery*	
iv)	Solid Waste	• *Dedicated TSDF with incinerator and land-fills for hazardous and non-hazardous wastes.*	• *New incinerator for handling additional load*

B. Efficiency of each pollution control equipment/system installed.

1. Existing Units

Sl. No.	**Name of the System Equipment**	**Design Efficiency %**	**Present Working efficiency %**
1	Incinerator Flue gas scrubbing system		
2	Effluent Treatment Plant		

2. Proposed Project

Sl. No.	**Name of the System Equipment**	**Design Efficiency %**
1	Incinerator Flue gas scrubbing system	
2	Effluent Treatment Plant	

XV. Green Belt Plan

A. Total area of project/township (in ha.) — *210*

B. Area already afforested (for existing projects), in ha. — *10*

C. Area proposed to be afforested (in ha.) — *6*

D. Plant species proposed

1. Indigenous — *Acacia nilotica, Salvadora persica, Azadirachta indica, Ailanthus excelsa, Zizyphus spp., Ficus bengalensis, Ficus religiosa, Bombax ceiba, Pongamia pinnata, Syzigium cuminii,*

2. Exotic — None

E. Width of green belt (minimum, in m.)

1. Along plant boundary — *5*
2. Roads and avenues within the plant — -
3. Ash Dike — -
4. Township — *10*
5. Other-ornamental, garden spaces, —
6. Commercial plantations etc. — -

F. Trees planted & proposed

		Nos.
1.	Planted	
2.	Survival rate	
3.	List of species planted	
4.	Proposed	*~6000*
5.	List of Species	*Acacia nilotica, Salvadora persica, Azadirachta indica, Ailanthus excelsa, Zizyphus spp., Ficus bengalensis, Ficus religiosa, Bombax ceiba, Pongamia pinnata, Syzigium cuminii,*

XVI. Construction Phase Management Aspects

A. Estimated duration of construction in months: *35*

B. Number of persons to be employed for construction

1. Peak
2. Average

C. What provision has been made for the sewage treatment for the construction workers?

Construction workers will come from nearby villages and towns. Some public sanitary toilets blocks have already been built. More are being built.

D. How the fuel (kerosene/wood, etc.) requirement of labour force will be met to avoid cutting of trees from the adjoining areas.

Construction workers will be residents of nearby villages and towns

E. Proposed Health care Measures with emphasis on protection from endemic diseases.

- *Supply of clean drinking water at work place*
- *Availability of first aid facilities and ambulances round the clock*
- *Improvement of health-care facilities (detailed in XVI F below)*
- *Construction of rest shelters and sanitary toilet blocks for construction workers also*

F. Educational and other social welfare measures proposed.

It is proposed to construct a Primary School for 1000 children. The proposed school will have 20 nos. class-rooms, library, administrative office, common amenities such as hall, toilets, kitchen & canteen, indoor sports rooms etc. At this school, the medium of instruction is likely to be Hindi, as most of the children's parents will be from Hindi-speaking regions of the country. The built-up area will be 3200 m^2; gardens and playground will cover another 10,000 m^2.

It is planned to construct a Community Centre having capacity for 500 people. Members of the SRY's worker community may gather at this community centre for group activities, social support, public information and other purposes. They may also organize other functions such as celebration of various occasions and traditions, open meetings, social gatherings, volunteer activities etc.. Officials / political leaders may come to meet the workers and seek their views. Such community functions will definitely help the workers to prosper, flourish and endure. The Community Centre will have multi-purpose hall, gymnasium, indoor sports room, library, sanitation facilities, kitchen office etc. The total built-up area will be 1500 m^2; gardens, prayer ground / religious function area shall cover another 7500 m^2.

Ship Recycling Industries Association (SRIA), the association of the plot owners is constructing a Trauma Centre, Health Care Centre and Welfare Centre for the workers at Alang itself, which is at an advanced stage of completion. In addition a building owned by Justice Dewan Charitable Trust is being taken over by Gujarat Maritime Board which will be converted into a full fledged hospital for the SRY workers. SRIA will bear the cost of all medical facilities.

XVII. Human Settlement

Sl. No.		Aerial distance from the periphery of the site		
		Upto 500m from periphery	500m to 3000 m from the periphery	3000m to 5000m from the periphery
1	Population	*8309*	*28704*	*19959*
2	Number of Houses	*1443*	*6803*	*3510*
3	Present occupational Pattern	*Wage labour, service, business, agriculture*	*Wage labour, service, business, agriculture*	*Wage labour, service, business, agriculture*

XVIII. Rehabilitation & Resettlement Plan (Wherever applicable): *Not Applicable*

A. Village(s) affected by the project:

S. No.	Village (Tribal/Others)	Population	Occupation	Average Income per annum

B. Population to be displaced

Sl. No	**Name of Village**	**Population**		
		Landoustees only	**Homestead oustees only**	**Land and Homestead oustees**
	No private land will be acquired. Hence no Land or Homestead Oustees			

C. Salient features of Rehabilitation Plan.: *Not Applicable*

(i) Site where the people are proposed to be resettled

(ii) Facilities proposed at the resettlement site
(iii) Compensation package
(iv) Agency/Authority responsible for their resettlement.

XIX. Expenditure on Environmental Measures

A. Capital cost of the project (as proposed to approved by the funding agency/financial Institutions

(Rs. Lakhs) *114000*

B. Cost of environmental protection measures (Rs. Lakhs)

S.No.		Recurring Cost per annum		Capital Cost	
		Existing	Proposed	Existing	Proposed
1	Air Pollution Control	-	*830 - 957*	*Included in Project Cost*	*47075.6**
2	Water Pollution Control	*3*	*215.5 - 444*	*22*	*17526**
3	Noise Pollution Control	-	-	-	-
4	Environment Monitoring and Management	*3*	*100*		
5	Reclamation borrow/mined area	*Not Applicable*			
6	Occupational Health	*1000*	*2000*		
7	Green Belt	*1*	*3*	*5*	*2 addl.*
8	Others • *Solid waste Management (Landfills)* • *Solid waste Management (Incinerator)* • *Dry Docks* • *Upgradation of existing plots*	*62* *35* *Not Applicable* *Not Applicable*	- *546** *152 – 406**	*617* *350* *Nil* *Nil*	- *5464** *4281** *76813**
Total					*86558*
**Exchange rate of Rs.67=1 US $ considered*					

3. Details of organizational set up/cell for environmental management and monitoring.

GMB has a dedicated Environmental Cell (EC) at its Head Office. This unit deals with all environment related issues and works of GMB's ports and ship recycling yards. The EC is headed by the Dy. General Manager, Environment who is an environmental engineer. He is assisted by two Environment Managers, one of whom is an environmental engineer and the other an environmental scientist. At GMB's Alang Office there is a dedicated team of 10 (ten) Safety Officers for looking after Health Safety and Environment (HSE) related matters.

Manager (Planning) has been deputed as In-charge Director-Safety to impart health and safety related training to workers at the SRY. GEPIL, who operate and maintain the TSDF have their own dedicated HSE personnel.

GMB arranges for accredited laboratories for undertaking environmental monitoring as and when required. However the environmental monitoring of the TSDF is carried out by the TSDF's own quality control laboratory. GMB is contemplating to augment the resources of this laboratory to carry out regular environmental monitoring for the entire yard.

For development and maintenance of jobs like drainage, clearing settling pits etc. individual plot owners utilize their own resources. Plantation works are undertaken by GMB as well as individual plot owners. CSR activities are looked after by GMB as well as by the plot owners through Ship Recycling Industries Association (SRIA), the association of the plot owners. SRIA is looking after occupational safety and health of workers of Alang-Sosiya SRY.

4. Details of community welfare/peripheral development programmes envisaged / being undertaken by the project proponent :

The proposed upgradation project includes amongst others construction of housing facilities for workers with proper water supply & sanitation, a community centre (for 500 people), a primary school for 1000 children, children's playground and other civic amenities.

Ship Recycling Industries Association (SRIA) – the association of the plot owners and GMB are developing a hospital at Alang with comprehensive facilities for the workers. GMB provides financial assistance for celebration of festivals and cultural events. GMB organizes medical camps for villagers. GMB arranges for distribution of books & stationary, school bags, uniforms, shoes & socks amongst village school children.

XX. Public Hearing details :

A. Date of Advertisement: *19th Sept.20115*

B. Newspapers in which the advertisement appeared (with copies)

English: "Western Times", Ahmedabad edition
Gujrati: "Sandesh" (સંદેશ), Bhavnagar edition

C. Date of Hearing *20 Oct., 2015*

D. Panel Present

- *Shri Banchhanidhi Pani, IAS, Collector, Bhavnagar*
- *Shri R.R. Vyas, Regional Officer, Gujarat Pollution Control Board, Bhavnagar*

E. List of public present along with address and occupation : *Refer Annexure 11*

The data and information given in this Performa are true to the best of my knowledge and belief

Date: 02-05-2016

Place: Gandhinagar

Signature of the Applicant with full name & address.

DEPUTY GENERAL MANAGER (ENV)
ENVIRONMENT CELL
GUJARAT MARITIME BOARD
GANDHINAGAR.

Given under the seal of organization on behalf of whom the applicant is signing.

OFFICE OF THE VICE CHAIRMAN & CHIEF EXECUTIVE OFFICER
G.M.B.

LIST OF DOCUMENTS TO BE ATTACHED WITH THE QUESTIONNAIRE
(Industry Sector Projects)

S.No	Documents to be Attached
1.	Topographic map of the site indicating contours (1:2500 scale)
2.	Topographic map covering 7 kms radius from the periphery of the site indicating main features
3.	Wind rose diagram of the site (Seasonal)
4.	Wind rose diagram of the site (Artificial)
5.	Site map indicating the positions of ambient air quality monitoring stations vis-à-vis wind direction
6.	Flow sheet of the process adopted indicating mass input/output, brief description of the process including technological and engineering details
7.	Alternative technologies considered along with details of criteria used for selecting the technology and results of evaluation
8.	Approval of ground water board/ irrigation department/ Municipality etc. for supply of water
9.	Mass balance for water used by the project in a flow chart
10.	Flow chart for waste water treatment with mass balance
11.	Site map indicating solid waste disposal facilities
12.	Approval of electricity connection and supply of electricity
13.	Lay out map of the plant showing the position of stacks for deciding the inter stack distance
14.	Site map indicating the storage facilities
15.	Approval of Chief controller of explosives for lay out and storage of hazardous substances
16.	Layout of green belt indicating width on all sides, trees, lawns and bushes
17.	Copy of advertisement issued in respect of public hearing
18.	No objection certificate from the pollution control board
19	In case of proposals for expansion copies of renewals of consent from SPCB / PCC
20.	In case of expansion proposal copy of approval of factory inspector
21.	Copy of the application submitted to the State Government for the forest clearance in case diversion of forest land is involved
22.	Comments/Observations/Recommendation of Chief Wildlife Warden in case wildlife habitat/ migration path exists within 25 kilometers of the project site
23.	Hydrogeological report in case ground water is to be used and/or the area is drought prone or the waste water is likely to be discharged on land
24.	Environmental Audit report for the previous two years in case of expansion of existing undertaking
25.	In case the proposal involves installations in coastal zone, copy of the application forwarded by the State Government

ANNEXURE 1: FLORA FOUND IN STUDY AREA

Table 1.1: Plants Found in Project Site

Sl. No.	Scientific Name	Local Name	Habit	Family
1.	*Acacia nilotica*	Bhaval	Tree	Mimosaceae
2.	*Agave americana*	Ketki	Under-shrub	Agavaceae
3.	*Calotropis procera*	Ankado	Shrub	Asclepiadaceae
4.	*Cynodon dactylon*	Dhroknad	Grass	Poaceae
5.	*Commelina benghalensis*	Shishmuliyan	Herb	Commelinaceae
6.	*Leucaena leucocephala*	Subabul	Tree	Fabaceae
7.	*Parthenium hysterophorus*	-	Herb	Asteraceae
8.	*Paspalum spp.*	-	Grass	Poaceae
9.	*Pergularia daemia*	Chamar dudheli	Climber	Asclepiadaceae
10.	*Prosopis juliflora*	Gando baval	Small tree	Mimosaceae
11.	*Suaeda maritima*	Alur	Herb	Chenopodiaceae
12.	*Tribulus terrestris*	Gokhru	Climber	Zygophyllaceae

Table 1.2: List of Plants Found Naturally in the Study Area

Sl. No.	Scientific Name	Local Name	Habit	Family
1.	*Abrus precatorius*	Chanothi	*Climber*	*Papilionaceae*
2.	*Abutilon glaucum*	Makamali	*Under-shrub*	*Malvaceae*
3.	*Abutilon indicum*	Khapat	*Under-shrub*	*Malvaceae*
4.	*Acacia leucophloea*	Harmo-baval	Tree	Mimosaceae
5.	*Acacia nilotica*	Bhaval	Tree	Mimosaceae
6.	*Acacia tortillis*	-	Tree	Mimosaceae
7.	*Achyranthes aspera*	Aghedo	Herb	Amaranthaceae
8.	*Agave americana*	Ketki	Under-shrub	Agavaceae
9.	*Ailanthus excelsa*	Araduso	Tree	Simarubiaceae
10.	*Albizzia lebbeck*	Siris	Tree	Mimosaceae
11.	*Alhagi pseudalhagi*	Javaso	Under-shrub	Papilionaceae
12.	*Alysicarpus longifolius*	Moto-samarvo	Herb	Papilionaceae
13.	*Alysicarpus vaginalis*	Zinko-samarvo	Herb	Papilionaceae
14.	*Amaranthus spinosus*	Kantalo-dambho	Herb	Amaranthaceae
15.	*Amaranthus viridis*	Dhimdo	Herb	Amaranthaceae
16.	*Anagallis arvensis*	Ratifudardi	Herb	Primulaceae
17.	*Apluda mutica*	Fulari ga	Grass	Poaceae
18.	*Argemone mexicana*	Darudi	Herb	Papavaraceae
19.	*Aristida adscensionis*	Lapdo	Grass	Poaceae
20.	*Aristida funiculate*	Laso lambh	Grass	Poaceae
21.	*Aristolochia bractcolata*	Kidamari	Herb	Aristolochiaceae
22.	*Asparagus dumosus*	Satavari	Climber	Liliaceae
23.	*Azadirachta indica*	Neem, Limdo	Tree	Meliaceae

Sl. No.	Scientific Name	Local Name	Habit	Family
24.	*Balanites aegyptica*	Ingoriyo	Small tree	Simarubiaceae
25.	*Barleria prionitis*	Kanthselio	Under-shrub	Acanthaceae
26.	*Boerhavia diffusa*	Punamava	Herb	Nyctaginaceae
27.	*Boerhavia verticillata*	Punamava	Herb	Nyctaginaceae
28.	*Borreria articularis*	Madhuri-jadi	Herb	Rubiaceae
29.	*Borreria stricta*	-	Herb	Rubiaceae
30.	*Brachiaria racemosa*	Kanzeru	Grass	Poaceae
31.	*Butea monosperma*	Kesudo	Small tree	Papilionaceae
32.	*Caesalpinia crista*	Kachaka	Shrub	Caesalpiniaceae
33.	*Calotropis procera*	Ankado	Shrub	Asclepiadaceae
34.	*Capparis decidua*	Kerdo	Shrub	Capparaceae
35.	*Capparis sepiaria*	Kanthar	Shrub	Capparaceae
36.	*Cardiospermum halicacabum*	Kagdolio	Climber	Sapindaceae
37.	*Cassia auriculata*	Aval	Shrub	Caesalpiniaceae
38.	*Cassia pumila*	Nani-chimed	Herb	Caesalpiniaceae
39.	*Cassia siamea*	Kesia	Tree	Caesalpiniaceae
40.	*Cassia tora*	Kuvandio	Herb	Caesalpiniaceae
41.	*Celosia argentata*	Lampdi	Herb	Amaranthaceae
42.	*Celosia cristata*	Mor-shikha	Herb	Amaranthaceae
43.	*Cenchus biflorus*	-	Grass	Poaceae
44.	*Cenchus ciliaris*	Anjan	Grass	Poaceae
45.	*Cenchus setigerus*	Dhaman gha	Grass	Poaceae
46.	*Chenopodium album*	Chilni-bhaji	Herb	Chenopodiaceae
47.	*Chenopodium murale*	Barelo	Herb	Chenopodiaceae
48.	*Chloris varigata*	Punjaniu ga	Grass	Poaceae
49.	*Chrysopogon fulvus*	Kharalu	Grass	Poaceae
50.	*Cicer arietimum*	Chana	Herb	Papilionaceae
51.	*Cissus quadrangularis*	Hadsankal	Climber	Vitaceae
52.	*Cleome simplicifolia*	Talwani	Herb	Capparaceae
53.	*Clitoria teurnatea*	Bibari	Herb	Papilionaceae
54.	*Coccinia grandis*	Tindora	Climber	Cucurbitaceae
55.	*Cocculus hirsutus*	Vagval, Asipal	Straggling shrub	Menispermaceae
56.	*Cocculus pendulus*	Vevadi	Semi-erect under-shrub	Menispermaceae
57.	*Commelina benghalensis*	Shishmuliyan	Herb	Commelinaceae
58.	*Commelina diffusa*	Shishmuliyan	Herb	Commelinaceae
59.	*Convolvulus arvensis*	Phudardi	Herb	Convolvulaceae
60.	*Convolvulus auricomus*	Ruchhadi-veldi	Climbing Herb	Convolvulaceae
61.	*Convolvulus microphyllus*	Shankhavali	Herb	Convolvulaceae
62.	*Corchorus aestuans*	Chhaunch	Under-shrub	Tiliaceae

Sl. No.	Scientific Name	Local Name	Habit	Family
63.	*Corchorus depressus*	Zinki Chh	Under-shrub	Tiliaceae
64.	*Corchorus fascicularis*	Chhunch	Under-shrub	Tiliaceae
65.	*Corchorus trilocularis*	Chhunch	Under-shrub	Tiliaceae
66.	*Cordia gharaf*	Liyar gundi	Tree	Ehretiaceae
67.	*Cressa cretica*	Paliyo	Herb	Convolvulaceae
68.	*Crotalaria burhia*	Shan	Under-shrub	Papilionaceae
69.	*Ctenolepis cerasiformis*	Aankh-phutamani	Climber	Cucurbitaceae
70.	*Cynodon dactylon*	Dhroknad	Grass	Poaceae
71.	*Cyperus rotundus*	Moth	Sedge	Cyperaceae
72.	*Dactyloctenium aegypticum*	Kagatango gha	Grass	Poaceae
73.	*Dactyloctenium sindicum*	Chund gha	Grass	Poaceae
74.	*Dalbergia sissoo*	Shisham	Tree	Papilionaceae
75.	*Dalechampia scandens*	Khijavani-vel	Climber	Euphorbiaceae
76.	*Datura metel*	Dhaturo	Under-shrub	Solanaceae
77.	*Desmostachya bipinnata*	Dhab	Grass	Poaceae
78.	*Derris indica*	Karang	Tree	Papilionaceae
79.	*Dichanthium annulatum*	Jinjavo	Grass	Poaceae
80.	*Digera muricata*	Kanejaro	Herb	Amaranthaceae
81.	*Echinops echinatus*	Utkantho	Herb	Asteraceae
82.	*Eclipta alba*	Bhangro	Herb	Asteraceae
83.	*Eragrostis ciliare*	Mamar	Grass	Poaceae
84.	*Eragrostis inella*	Lamar	Grass	Poaceae
85.	*Eragrostis unioloides*	Chakaladum	Grass	Poaceae
86.	*Eragrostis viscosa*	-	Grass	Poaceae
87.	*Euphorbia hirta*	Rati-dudheli	Herb	Euphorbiaceae
88.	*Euphorbia nelvulia*	Nad thor	Shrub	Euphorbiaceae
89.	*Euphorbia prostrata*	-	Herb	Euphorbiaceae
90.	*Euphorbia pulcherimma*	Lal-patti	Under-shrub	Euphorbiaceae
91.	*Euphorbia thymifolia*	Nani-dudheli	Herb	Euphorbiaceae
92.	*Euphorbia tirucalli*	Kharsani	Herb	Euphorbiaceae
93.	*Evolvulus alsinoides*	Kali-sankhavali	Herb	Convolvulaceae
94.	*Fagonia cretica*	Dhamaso	Under-shrub	Zygophyllaceae
95.	*Ficus bengalensis*	Vad	Tree	Moraceae
96.	*Ficus racemosa*	Umbaro-guler	Tree	Moraceae
97.	*Ficus religiosa*	Piplo	Tree	Moraceae
98.	*Fluggea leucopyra*	Thumari	Shrub	Euphorbiaceae
99.	*Gloriosa superba*	Kankasani	Herb	Liliaceae
100.	*Goniogyna hirta*	Adadiyo	Herb	Fabaceae
101.	*Grewia tenax*	Gangeti	Shrub	Tiliaceae
102.	*Hewittia sublobata*	-	Herb	Convolvulaceae

Sl. No.	Scientific Name	Local Name	Habit	Family
103.	*Hibiscus cannabinus*	Amboi	Under-shrub	Malvaceae
104.	*Hibiscus micranthus*	Chanak-bhindo	Under-shrub	Malvaceae
105.	*Indigofera cordifolia*	Gadar gari	Herb	Fabaceae
106.	*Indigofera linnaei*	Bhoigali	Herb	Fabaceae
107.	*Indigofera obligifolia*	Ziladi	Under-shrub	Fabaceae
108.	*Indigofera otinctoria*	Gali	Under-shrub	Fabaceae
109.	*Ipomea carica*	Moti-fudard	Climber	Convolvulaceae
110.	*Ipomea fistulosa*	-	Under-shrub	Convolvulaceae
111.	*Ipomea pes-caprae*	Arvel	Straggling herb	Convolvulaceae
112.	*Jatropha curcas*	Ratan jyot	Shrub	Euphorbiaceae
113.	*Jatropha gossypifolia*	Vilayti aranda	Shrub	Euphorbiaceae
114.	*Justicia simplex*	-	Herb	Acanthaceae
115.	*Lantana camara*	Indradhanu	Shrub	Verbenaceae
116.	*Launea procumbens*	Moti	Herb	Asteraceae
117.	*Launea sarmentosa*	Bhoipatri	Herb	Asteraceae
118.	*Lepidognathis cuspidata*	Paneru	Under-shrub	Acanthaceae
119.	*Lepidognathis trinervis*	Paneru	Under-shrub	Acanthaceae
120.	*Leptadenia pyrotechnica*	Khip	Under-shrub	Asclepiadaceae
121.	*Leptadenia reticulate*	Nani-dedi	Twiner	Asclepiadaceae
122.	*Leucaena leucocephala*	Subabul	Tree	Fabaceae
123.	*Luffa acutangula*	Turiyon	Climber	Cucurbitaceae
124.	*Mangifera indica*	Keri	Tree	Anacardiaceae
125.	*Melanocenchrus spp.*	-	Grass	Poaceae
126.	*Merremia gangetica*	Undat-kani	Herb	Convolvulaceae
127.	*Mimosa hamata*	Kaibaval	Under-shrub	Fabaceae
128.	*Mucuna prurita*	Kuvech	Herb	Fabaceae
129.	*Mukia maderaspatana*	Chimbhadi	Climber	Cucurbitaceae
130.	*Ocimum basilicum*	Tak-maria	Under-shrub	Labiateae
131.	*Ocimum sanctum*	Tulsi	Under-shrub	Labiateae
132.	*Opuntia elatior*	Fafdo thor	Shrub	Cactaceae
133.	*Parthenium hysterophorus*	-	Herb	Asteraceae
134.	*Paspalum spp.*	-	Grass	Poaceae
135.	*Pedalia murex*	Gokharum	Under-shrub	Pedaliaceae
136.	*Penatropis spiralis*	Shingroti	Twiner	Asclepiadaceae
137.	*Pergularia daemia*	Chamar dudheli	Climber	Asclepiadaceae
138.	*Peristrophe bicalyculata*	Kali ghadhedi	Herb	Acanthaceae
139.	*Phoenix sylvestris*	Khajuri	Tree	Arecaceae
140.	*Phyllanthus niuri*	Bhoi ambli	Herb	Euphorbiaceae
141.	*Phyllanthus maderaspatensis*	-	Herb	Euphorbiaceae
142.	*Physalis longifolia*	-	Herb	Solanaceae

Sl. No.	Scientific Name	Local Name	Habit	Family
143.	*Physalisminima*	Popati	Herb	Solanaceae
144.	*Polycarpaea corymbosa*	Ful-chagaro	Herb	Caryophyllaceae
145.	*Polycarpaea spicata*	Vajradanti	Herb	Caryophyllaceae
146.	*Portulaca oleracea*	Luni	Herb	Portulacaceae
147.	*Polygala chilensis*	Pili-bhoyasan	Herb	Polygalaceae
148.	*Polygala erioptera*	Bhoyasan	Herb	Polygalaceae
149.	*Prosopis juliflora*	Gando baval	Small tree	Mimosaceae
150.	*Prosopis cineraria*	Khijdo	Tree	Mimosaceae
151.	*Pulicaria wightiana*	Sonosaliya	Herb	Asteraceae
152.	*Pupalia lappacea*	Zipto	Herb	Amaranthaceae
153.	*Rhynchosia minima*	Nani-kamalvel	Twiner	Fabaceae
154.	*Rivea hypocrateriformis*	Fang	Climbing Shrub	Convolvulaceae
155.	*Rivea ornata*	Fang	Climbing Shrub	Convolvulaceae
156.	*Salvadora persica*	Piludi	Shrub	Salvadoraceae
157.	*Sesamum laciniatum*	Vagadau-tal	Herb	Pedliaceae
158.	*Sesbania bispinosa*	Ikad	Herb	Fabaceae
159.	*Saccharum officinarum*	Wad	Grass	Poaceae
160.	*Scirpus articulatus*	-	Grass / Herb	Cyperaceae
161.	*Sida acuta*	Bala	Under-shrub	Malvaceae
162.	*Sida alba*	Kantali-bala	Under-shrub	Malvaceae
163.	*Sida cordata*	Bhoibala	Herb	Malvaceae
164.	*Sida cordifolia*	Mahabala	Under-shrub	Malvaceae
165.	*Sida ovata*	Bala	Under-shrub	Malvaceae
166.	*Solanum melongena*	Ringana	Herb	Solanaceae
167.	*Solanumnigrum*	Piludi	Herb	Solanaceae
168.	*Solanumsurattense*	Bhoi-ringani	Herb	Solanaceae
169.	*Suaeda maritima*	Alur	Herb	Chenopodiaceae
170.	*Syzigium cuminii*	Jambu	Tree	Myrtaceae
171.	*Tamarindus indica*	Ambli	Tree	Caesalpiniaceae
172.	*Tephrosia purpurea*	Sarpankho	Under-shrub	Fabaceae
173.	*Tephrosia strigosa*	Zinko-Sarpankho	Herb	Fabaceae
174.	*Thespesia populnea*	Paras-piplo	Tree	Malvaceae
175.	*Tinospora cordifolia*	-	Shrub	Menispermaceae
176.	*Trianthema portulacastrum*	Satodo	Herb	Aizoceae
177.	*Tribulus terrestris*	Gokhru	Climber	Zygophyllaceae
178.	*Trichodesma indicum*	Undha-fuli	Herb	Boraginaceae
179.	*Trichodesma zeylanicum*	Undha-fuli	Herb	Boraginaceae
180.	*Tridax procumbens*	Pardeshi bhangro	Herb	Asteraceae
181.	*Triumfetta rhomboidea*	Zipti	Under-shrub	Tiliaceae
182.	*Triumfetta rotundifolia*	Zipto	Under-shrub	Tiliaceae

Sl. No.	Scientific Name	Local Name	Habit	Family
183.	*Typha angustifolia*	Gha-bajarium	Sedge	Typhaceae
184.	*Vernonia cinerea*	Shahadevi	Herb	Asteraceae
185.	*Vitex negundo*	Nagod	Shrub	Verbenaceae
186.	*Xanthium indicum*	Gadarivum	Herb	Asteraceae
187.	*Xeromphis uliginosa*	Ganjeda	Shrub	Rubiaceae
188.	*Zizyphus globerrima*	-	Tree	Rhamnaceae
189.	*Zizyphus glabrata*	-	Tree	Rhamnaceae
190.	*Zizyphus mauritiana*	Khareki bor	Small Tree	Rhamnaceae
191.	*Zizyphus nummularia*	Chani-bor	Shrub	Rhamnaceae
192.	*Zornia gibbosa*	-	Herb	Fabaceae

Table 1.3: Composition of Phytoplankton Community in Sea Water

Stations 0.1 km, 0.5 km, ~2 km		Phytoplankton genera			Shannon Weaver Index
Station A	0.1 km offshore	*Navicula spp.*	*Coscinodiscus spp*	*Nitzschia spp.*	0.99
	0.5 km offshore	*Navicula spp.*	*Coscinodiscus spp*	*Nitzschia spp.*	0.99
	~2 km offshore	*Navicula spp.*	*Coscinodiscus spp*	*Nitzschia spp.*	0.90
Station B	0.1 km offshore	*Navicula spp.*	*Coscinodiscus spp*	*Nitzschia spp.*	0.96
	0.5 km offshore	*Navicula spp.*	*Coscinodiscus spp*	*Nitzschia spp.*	0.96
	~2 km offshore	*Navicula spp.*	*Coscinodiscus spp*	*Nitzschia spp.*	0.68
Station C	0.1 km offshore	*Navicula spp.*	*Coscinodiscus spp*	*Nitzschia spp.*	0.80
	0.5 km offshore	*Navicula spp.*	*Coscinodiscus spp*	*Nitzschia spp.*	0.80
	~2 km offshore	*Navicula spp.*	*Coscinodiscus spp*	*Nitzschia spp.*	0.68
Station D	0.1 km offshore	*Navicula spp.*	*Coscinodiscus spp*		0.69
	0.5 km offshore	*Navicula spp.*	*Coscinodiscus spp*		0.69
	~2 km offshore	*Navicula spp.*	*Coscinodiscus spp*	*Surirella spp.*	0.68
Station E	0.1 km offshore	*Navicula spp*	*Coscinodiscus spp*		0.50
	0.5 km offshore	*Navicula spp*	*Coscinodiscus spp*		0.50
	~2 km offshore	*Navicula spp*	*Coscinodiscus spp*		0.45

ANNEXURE 2: FAUNA FOUND IN STUDY AREA

Table 2.1: Fauna Found in Project Site

Sl. No.	Common Name	Scientific Name	Schedule of Wild Life Protection Act in Which Listed
Mammals			
1.	Common Mongoose	*Herpestres edwardsii*	IV
2.	Jackal	*Canis aureus*	II
3.	Indian Fox	*Vulpes bengalensis*	II
4.	Common house rat	*Rattus rattus*	V
5.	Nilgai	*Boselaphus tragocamelus*	III
6.	Squirrel	*Funambulus pennanti*	IV
Birds			
1	Red Wattled Lapwing	*Vannelus indica*	IV
2	Indian Reef Heron	*Egretta gularis*	IV
3	Whimbrel	*Numenius phaeopus*	IV
4	Common Sandpiper	*Tringa hypoleucos*	IV
5	Pariah Kite	*Milvus migrans*	-
6	Common Crow	*Corvus splendens*	V
7	Grey Partridge	*Francolinus pondicerianus*	IV
8	Black Ibis	*Pseudibis papillosa*	IV
9	White Ibis	*Theskiornis aethiopica*	IV
10	Painted Stork	*Mycteria leucocephala*	IV
11	Little Egret	*Egretta garzetta*	IV
12	Drongo	*Dicrurus adsimilis*	IV
13	Koel	*Eudynamis scolopacea*	IV
14	House Swift	*Apus affinis*	IV
15	White Breasted Kingfisher	*Halcyon smyrnensis*	IV
16	Jungle Babbler	*Turdoides striatus*	IV
17	Large Grey Babbler	*Turdoides molcolmi*	IV
18	Green Bee-eater	*Merops orientalis*	IV
19	Chestnut Headed Bee-eater	*Merops leschenaulti*	IV
20	Shrike	*Lanius spp.*	IV
21	Common Tern	*Sterna hindo*	IV
22	Brahminy Kite	*Haliastur indus*	IV
23	Brahminy Mynah	*Sturnus pagodarum*	IV
24	Red Vent Bulbul	*Pycnonotus cafer*	IV
25	Small Indian Cormorant	*Phalacrocorax niger*	IV

Sl. No.	Common Name	Scientific Name	Schedule of Wild Life Protection Act in Which Listed
26	Kentish Plover	*Charadius alexandrinus*	IV
27	Black Winged Stilt	*Himantopus himantopus*	IV

Table 2.2: List of Terrestrial Animals found in the Study Area

Sl. No.	Common Name	Scientific Name	Schedule of Wild Life Protection Act in Which Listed
Mammals			
1.	Common Mongoose	*Herpestres edwardsii*	IV
2.	Jackal	*Canis aureus*	II
3.	Indian Fox	*Vulpes bengalensis*	II
4.	Common house rat	*Rattus rattus*	V
5	Nilgai	*Boselaphus tragocamelus*	III
6	Squirrel	*Funambulus pennanti*	IV
8	Fulvous fruit bat	*Rousettus leschnaulti*	
Reptiles			
1.	Wall Lizard	*Hemidactylus spp.*	-
2.	Cobra	*Naja naja*	II
3.	Yellow Rat Snake	*Ptyas mucosus*	II
4.	Common Skink	*Mabuya carinata*	II
5	Garden Lizard	*Calotes versicolor*	-
Birds			
1	Pariah Kite	*Milvus migrans*	-
2	Common Crow	*Corvus splendens*	V
3	Grey Partridge	*Francolinus pondicerianus*	IV
4	House Sparrow	*Passer domesticus*	-
5	White Wagtail	*Motacilla alba*	IV
6	Grey Wagtail	*Motacilla cineara*	IV
7	Common Tailorbird	*Orthotomus sutorius*	IV
8	Drongo	*Dicrurus adsimilis*	IV
9	Crow Pheasant	*Centropus sinensis*	IV
10	Blue Jay / Indian Roller	*Coracias benghalensis*	IV
11	White eared Bulbul	*Pycnonotus leucotis*	IV
12	Red Vent Bulbul	*Pycnonotus cafer*	IV
13	Koel	*Eudynamis scolopacea*	IV
14	Pegion	*Columba livia*	IV
15	Indian Ring Dove	*Streptopelia decacto*	IV
16	Red Turtle Dove	*Streptopelia tranquebarica*	IV
17	Black Winged Kite	*Elanus caeruleus*	IV
18	Jungle Babbler	*Turdoides striatus*	IV
19	Common Babbler	*Turdoides caudatus*	IV

Sl. No.	Common Name	Scientific Name	Schedule of Wild Life Protection Act in Which Listed
20	Large Grey Babbler	*Turdoides malcolmi*	IV
21	Hoopoe	*Upupa epops*	IV
22	White Throated Munia	*Lonchura malabarica*	IV
23	Indian Robin	*Saxicoloides fulicata*	IV
24	Ashy Wren warbler	*Prinia socialis*	IV
25	Franklin's Wren warbler	*Prinia hodgsonii*	IV
26	Shikra	*Accipiter badius*	IV
27	House Swift	*Apus affinis*	IV
28	Green Bee-eater	*Merops orientalis*	IV
29	Blue Cheeked Bee-eater	*Merops persica*	IV
30	Bay-backed Shrike	*Lanius vittatus*	IV
31	Magpie Robin	*Copsychus saularis*	IV
32	Grey Shrike	*Lanius excubitor*	IV
33	Barn Swallow	*Hirindo rustica*	IV
34	Wire Tailed Swallow	*Hirundo smithii*	IV
35	Painted Stork	*Mycteria leucocepahala*	IV
36	Little Tern	*Sterna albifrons*	IV
37	Common Tern	*Sterna hindo*	IV
38	Booted Warbler	*Hippolais caligata*	IV
39	Paddyfield warbler	*Acrocephala agricola*	IV
40	Crested Lark	*Galerida cristata*	IV
41	Malabar Crested Lark	*Galerida malabarica*	IV
42	Ashy Crowned Finch Lark	*Eremopterix grisea*	IV
43	Sand Lark	*Calandrella raytal*	IV
44	Red Wattled Lapwing	*Vannelus indica*	IV
45	Black Winged Stilt	*Himantopus himantopus*	IV
46	White Breasted Kingfisher	*Halcyon smyrnensis*	IV
47	Intermediate Egret	*Egretta intermedia*	IV
48	Cattle Egret	*Bubulcus ibis*	IV
49	Little Egret	*Egretta garzetta*	IV
50	Indian Reef Heron	*Egretta gularis*	IV
51	Pond Heron	*Ardeola grayii*	IV
52	Small Indian Cormorant	*Phalacrocorax niger*	IV
53	Whimbrel	*Numenius phaeopus*	IV
54	Common Sandpiper	*Tringa hypoleucos*	IV
55	Stone Curlew	*Burhinus oedicnemus*	IV
56	Black Ibis	*Pseudibis papillosa*	IV
57	White Ibis	*Theskiornis aethiopica*	IV
58	Spoonbill	*Palatea leucocordia*	IV
59	Grey Heron	*Ardea cinerea*	IV
60	River Tern	*Sterna aurantia*	IV

Sl. No.	Common Name	Scientific Name	Schedule of Wild Life Protection Act in Which Listed
61	Brahminy Kite	*Haliastur indus*	IV
62	Brahminy Mynah	*Sturnus pagodarum*	IV
63	Kentish Plover	*Charadius alexandrinus*	IV

Table 2.3: Composition of Zooplankton Community in Sea Water

Stations 0.1 km, 0.5 km, ~2 km		Zooplankton Groups		
Opposite Jaspara	0.1 km offshore	-	-	-
	0.5 km offshore	-	-	-
	~2 km offshore	Foramenifera	-	-
Yard Off Sosiya	0.1 km offshore	-	-	-
	0.5 km offshore	-	-	-
	~2 km offshore	Copepods	Decapods	-
Yard Near Alang Fire Station	0.1 km offshore	Copepods	-	-
	0.5 km offshore	Copepods	-	-
	~2 km offshore	-	-	-
Yard off existing southern most plot	0.1 km offshore	Copepods	Foramenifera	-
	0.5 km offshore	Copepods	Foramenifera	-
	~2 km offshore	Copepods	-	-
Near Proposed Dry-Dock-2 Site	0.1 km offshore	Copepods	Polychaeta	Gastropods
	0.5 km offshore	Copepods	Polychaeta	Gastropods
	~2 km offshore	Copepods	Polychaeta	Foramenifera

Table 2.4: Composition of Zooplankton Community in Sea Water

Stations 0.1 km, 0.5 km, ~2 km		Benthic Groups	
Opposite Jaspara	0.1 km offshore	-	-
	0.5 km offshore	Polychaeta	Bivalves
	~2 km offshore	-	-
Yard Off Sosiya	0.1 km offshore	Polychaeta	-
	0.5 km offshore	Polychaeta	-
	~2 km offshore	Polychaeta	-
Yard Near Alang Fire Station	0.1 km offshore	Polychaeta	-
	0.5 km offshore	Polychaeta	-
	~2 km offshore	Polychaeta	-
Yard off existing southern most plot	0.1 km offshore	-	-
	0.5 km offshore	-	-
	~2 km offshore	Polychaeta	Crabs
Near Proposed Dry-Dock 2 Site	0.1 km offshore	-	-

Stations 0.1 km, 0.5 km, ~2 km		Benthic Groups	
	0.5 km offshore	-	-
	~2 km offshore	Polychaeta	Crabs

Table 2.5: Fauna of Intertidal Zone

Station	***Fauna Present***
Opposite Jaspara	Neries, *Gastropods (*Trochus spp., Telescopium spp *), *Bivalve (*Donax spp.*,* Sunetta spp.**), Rock Oyster*, Fiddler Crab, Hermit Crabs*
Yard Off Sosiya	*Gastropods (*Trochus spp., Pseudomoris spp., Clavus spp.*) Acorn Barnacles (*Balanus spp.*), Rock Oyster, Pistol Shrimp, Goby fish (*Parachaeturichthy spp.*)*
Yard Near Alang Fire Station	*Gastropods (*Cerithidae spp.**), Bivalve (*Donax spp.*), Polychaete colonies*
Yard off existing southern most plot	*Polychaete colonies, Gastropods (*Trochus sps, Clavus spp*, Cerithium spp* , Clypeomorus spp.* *), Sea Slugs (*Sedadoris sps*), Crabs (*Matuta lunaris, Graspus spp, Macropthalamus spp.*)*
Near Proposed Dry-Dock 2 Site	*Polychaete colonies, Gastropods (*Trochus sps, Cerithium spp* *), Bivalve (*Donax spp.*)*
*Dead / Empty shells only	

Table 2.6: Fisheries statistics of Bhavnagar District (2009 – 2014)

Name of Fish	2009	2010	2011	2013	2014	Total	%
Shrimp	647.086	605.560	169.290	166.130	524.508	2112.574	33.16
Prawns (M)	88.411	117.116	38.628	35.648	97.303	377.106	5.92
Prawns (J)	0	0	1.488	0	0	1.488	0.02
Bombay Duck	326.411	148.319	53.194	103.149	147.772	778.845	12.22
Hilsa	235.800	201.790	53.250	85.500	173.724	750.064	11.77
Other Clupeids	180.310	159.620	29.495	62.800	93.655	525.88	8.25
Mullet	190.106	184.380	34.321	34.164	68.851	511.822	8.03
Levta	76.252	78.791	32.166	14.612	33.220	235.041	3.69
Cat fish	71.914	57.478	21.626	11.887	63.067	225.972	3.55
Shark	83.302	51.454	15.910	10.815	53.381	214.862	3.37
Crab	48.875	51.354	15.185	11.916	16.369	143.699	2.26
TOTAL	1948.467	1655.862	464.553	536.621	1271.85	5877.353	
All figures in t							
Source: State Fisheries Deptt., Bhavnagar							

ANNEXURE 3: SEASONAL WIND ROSE PATTERN AT ALANG

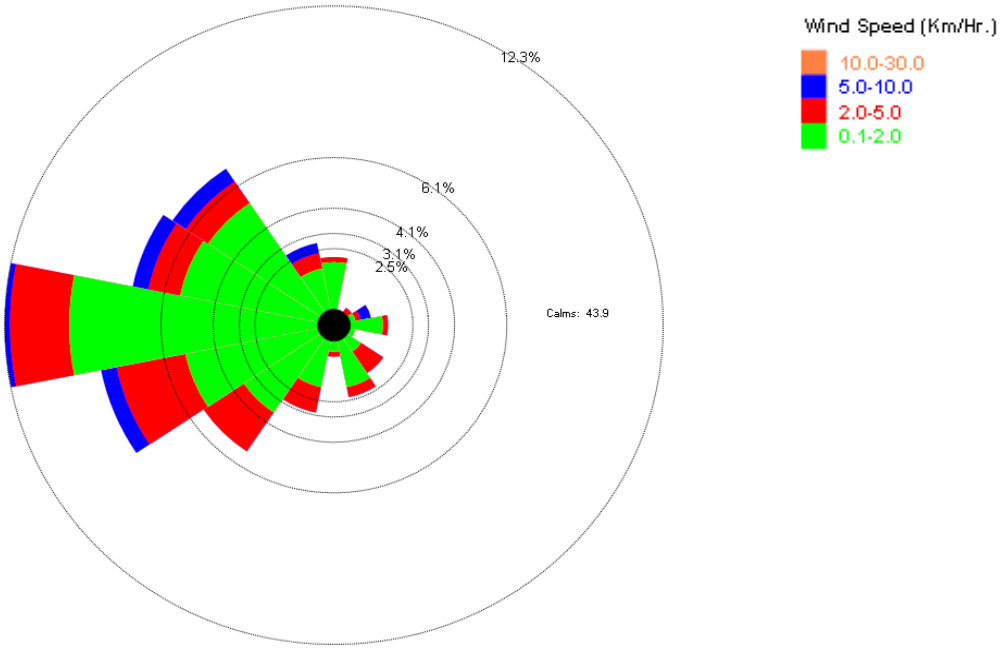


Fig. 3.1: Day Time Wind Rose at Alang-Sosiya SRY (Summer Season, 2015)

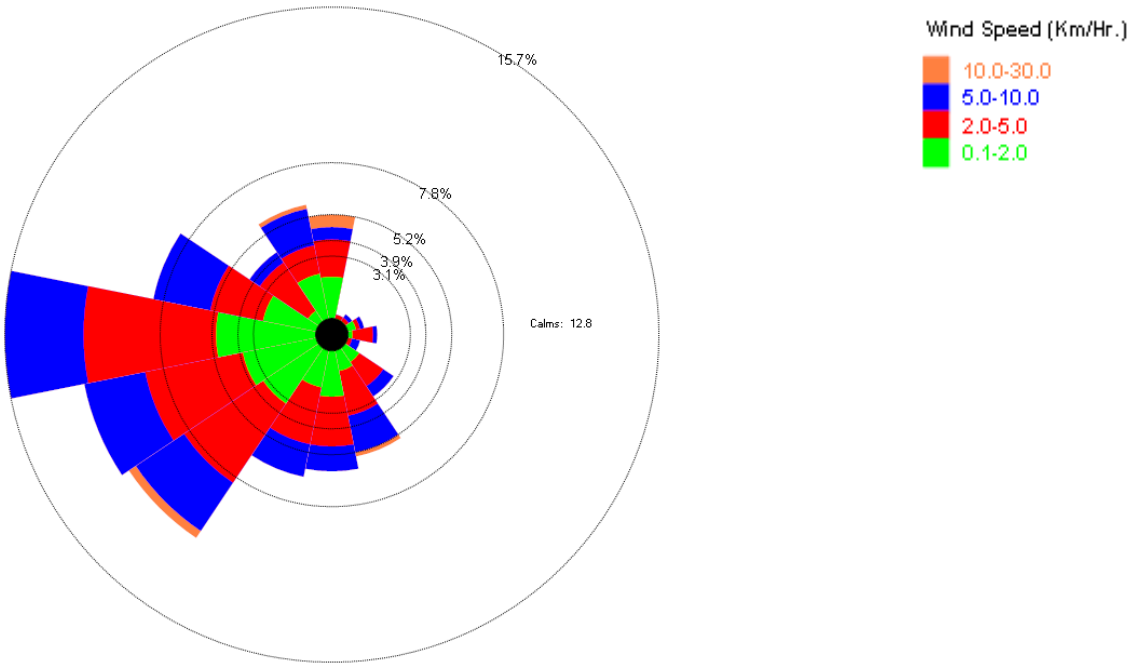


Fig. 3.2: Night Time Wind Rose at Alang Sosiya SRY (Summer Season, 2015)

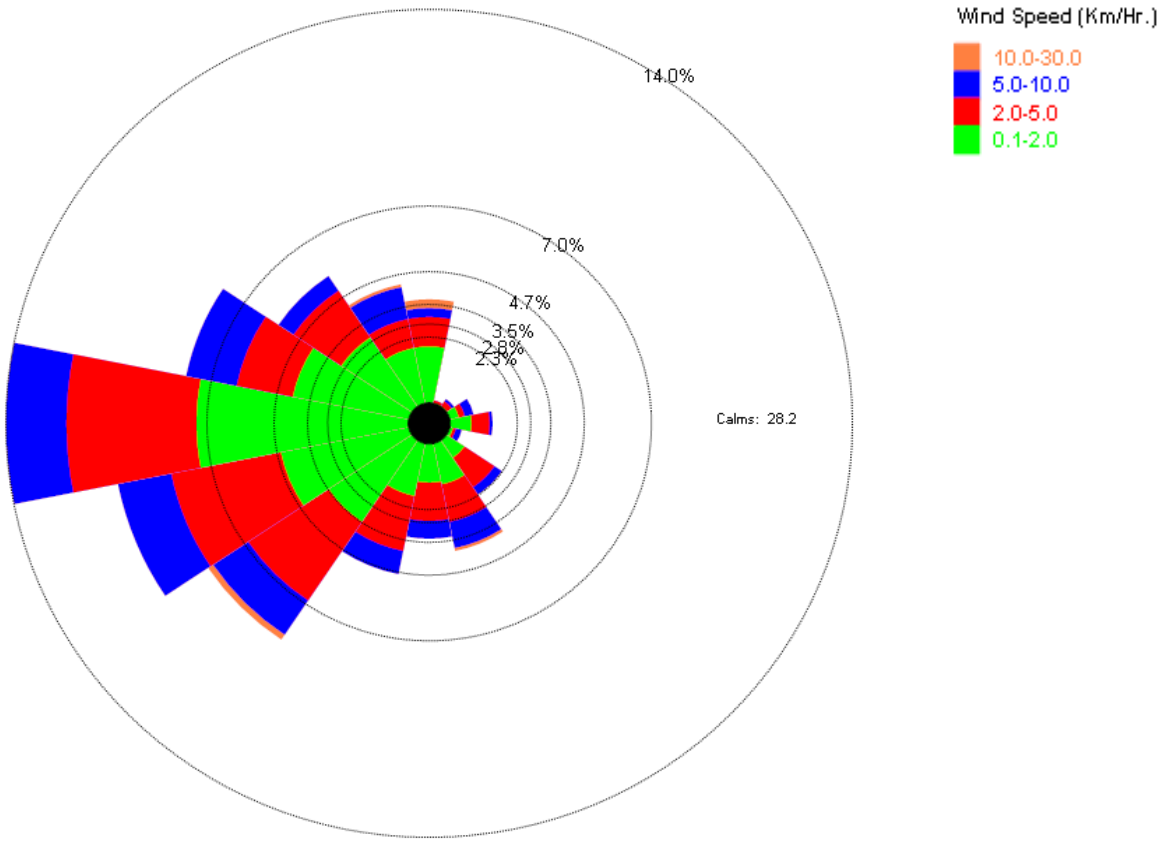


Fig. 3.3: Overall Wind Rose at Alang-Sosiya SRY (Summer Season, 2015)

Annexure – 4: DATE-WISE AAQ MONITORING RESULTS

Table 4.1 : Detailed Ambient Air Quality results for Opp. Alang Fire Station, Summer 2015

Sample No.	Date	Results in µg/m^3				CO Results in mg/m^3		
		PM_{10}	$PM_{2.5}$	SO_2	NOx	Max.	Min.	Avg.
1	03-03-15	77	50	9.5	45.5	0.98	0.15	0.44
2	08-03-15	71	48	9.6	34.5	0.99	0.13	0.41
3	12-03-15	84	58	8.5	30.2	0.88	0.16	0.38
4	15-03-15	114	63	11.2	36.6	1.022	0.15	0.53
5	19-03-15	66	41	6.2	44.0	1.02	0.15	0.46
6	22-03-15	66	46	7.8	35.6	1.06	0.15	0.47
7	25-03-15	65	37	8.5	32.2	1.11	0.15	0.52
8	28-03-15	88	54	8.2	20.2	1.22	0.15	0.55
9	01-04-15	98	56	4.5	36.6	1.05	0.12	0.39
10	05-04-15	63	27	6.2	24.2	1.22	0.12	0.40
11	08-04-15	73	47	8.5	30.2	1.20	0.18	0.53
12	11-04-15	95	46	7.2	29.6	0.88	0.11	0.40
13	15-04-15	87	55	5.3	30.2	1.32	0.11	0.51
14	20-04-15	84	51	4.5	42.2	0.99	0.19	0.54
15	23-04-15	80	45	7.2	36.6	1.05	0.11	0.48
16	27-04-15	86	37	6.6	30.2	1.22	0.15	0.42
17	02-05-15	98	56	8.5	21.2	1.20	0.08	0.48
18	06-05-15	75	35	9.5	32.2	1.11	0.13	0.53
19	09-05-15	84	41	6.3	29.6	1.30	0.12	0.46
20	13-05-15	87	36	5.5	26.6	0.99	0.12	0.46
21	18-05-15	75	35	7.5	32.2	1.05	0.10	0.48
22	22-05-15	56	26	6.2	30.2	0.99	0.09	0.48
23	26-05-15	61	32	5.2	22.2	0.95	0.15	0.43
24	30-05-15	83	42	7.5	28.3	1.08	0.14	0.45

Table 4.2 : Detailed Ambient Air Quality results for Alang Village, Summer 2015

Sample No.	Date	Results in µg/m^3				CO Results in mg/m^3		
		PM_{10}	$PM_{2.5}$	SO_2	NOx	Max.	Min.	Avg.
1	03-03-15	82	56	7.5	20.2	0.77	0.08	0.33
2	08-03-15	59	30	8.5	16.6	0.99	0.08	0.34
3	12-03-15	66	40	5.5	32.2	0.85	0.11	0.37
4	15-03-15	98	58	10.5	30.2	0.68	0.15	0.32
5	19-03-15	81	52	10.2	20.2	0.85	0.08	0.31
6	22-03-15	69	40	6.3	25.2	0.88	0.11	0.30
7	25-03-15	97	51	4.5	18.5	0.65	0.08	0.29
8	28-03-15	98	54	8.6	25.2	0.85	0.15	0.33
9	01-04-15	88	32	5.8	20.2	0.88	0.19	0.37
10	05-04-15	81	35	6.4	30.2	0.77	0.22	0.38
11	08-04-15	80	34	6.8	21.2	0.78	0.11	0.38
12	11-04-15	111	66	9.2	32.2	0.78	0.14	0.34
13	15-04-15	48	22	4.5	28.5	0.82	0.15	0.36
14	20-04-15	65	26	6.6	30.2	0.78	0.15	0.33
15	23-04-15	76	29	7.2	18.5	0.82	0.14	0.38
16	27-04-15	75	26	5.6	13.2	0.88	0.11	0.39
17	02-05-15	68	38	8.4	19.6	0.61	0.13	0.36
18	06-05-15	71	38	9.5	15.5	0.74	0.17	0.36
19	09-05-15	80	42	7.2	16.6	0.70	0.10	0.21
20	13-05-15	65	34	5.5	18.5	0.61	0.13	0.34
21	18-05-15	75	38	6.5	12.2	0.80	0.11	0.36
22	22-05-15	55	26	5.4	28.5	0.74	0.11	0.36
23	26-05-15	70	33	6.2	27.5	0.87	0.08	0.35

24	30-05-15	95	58	5.2	26.6	0.88	0.10	0.33

Table 4.3 : Detailed Ambient Air Quality results for Sosiya Village, Summer 2015

Sample No.	Date	Results in µg/m^3				CO Results in mg/m^3		
		PM_{10}	$PM_{2.5}$	SO_2	NOx	Max.	Min.	Avg.
1	03-03-15	83	45	5.6	20.2	0.84	0.08	0.30
2	08-03-15	77	45	9.6	16.6	0.75	0.08	0.28
3	12-03-15	98	55	4.8	19.5	0.75	0.08	0.30
4	15-03-15	66	37	7.6	30.2	0.88	0.08	0.33
5	19-03-15	92	56	5.2	21.2	0.78	0.08	0.29
6	22-03-15	68	39	4.8	15.5	0.74	0.09	0.33
7	25-03-15	81	40	5.1	17.3	0.84	0.09	0.33
8	28-03-15	75	44	9.5	31.2	0.78	0.13	0.33
9	01-04-15	66	34	5.5	26.6	0.82	0.10	0.34
10	05-04-15	97	52	6.2	15.5	0.65	0.11	0.30
11	08-04-15	85	44	4.2	16.6	0.62	0.08	0.24
12	11-04-15	97	42	5.5	20.2	0.80	0.08	0.27
13	15-04-15	66	31	6.2	18.5	0.82	0.09	0.35
14	20-04-15	58	28	6.3	16.6	0.88	0.09	0.33
15	23-04-15	87	41	4.5	26.2	0.85	0.08	0.33
16	27-04-15	56	29	5.5	16.5	0.85	0.07	0.26
17	02-05-15	48	23	8.5	34.5	0.75	0.08	0.26
18	06-05-15	58	27	9.6	30.2	0.82	0.08	0.24
19	09-05-15	75	30	6.5	16.2	0.56	0.08	0.21
20	13-05-15	45	26	5.2	12.2	0.84	0.11	0.35
21	18-05-15	68	31	4.5	16.6	0.88	0.11	0.31
22	22-05-15	70	37	5.2	15.2	0.78	0.09	0.31
23	26-05-15	87	44	6.2	21.2	0.85	0.12	0.35
24	30-05-15	66	32	4.5	16.2	0.62	0.08	0.29

Table 4.4 : Detailed Ambient Air Quality results for Mathavda Village, Summer 2015

Sample No.	Date	Results in µg/m^3				CO Results in mg/m^3		
		PM_{10}	$PM_{2.5}$	SO_2	NOx	Max.	Min.	Avg.
1	03-03-15	80	41	5.2	20.2	0.75	0.09	0.31
2	08-03-15	70	33	4.8	16.2	0.85	0.09	0.30
3	12-03-15	52	27	6.2	31.2	0.75	0.09	0.26
4	15-03-15	31	14	4.6	15.5	0.75	0.09	0.28
5	19-03-15	94	41	8.5	34.2	0.66	0.12	0.31
6	22-03-15	87	44	7.2	20.2	0.71	0.09	0.30
7	25-03-15	66	31	6.2	18.5	0.66	0.09	0.31
8	28-03-15	74	38	8.3	17.0	0.75	0.09	0.29
9	01-04-15	70	40	4.2	21.2	0.66	0.09	0.30
10	05-04-15	65	32	6.6	28.5	0.88	0.09	0.29
11	08-04-15	84	41	5.2	30.2	0.66	0.07	0.30
12	11-04-15	74	36	4.5	15.5	0.88	0.09	0.32
13	15-04-15	56	27	6.2	13.1	0.68	0.09	0.23
14	20-04-15	48	22	7.5	20.2	0.75	0.09	0.30
15	23-04-15	77	38	6.2	26.6	0.99	0.09	0.29
16	27-04-15	58	29	5.5	25.5	0.88	0.08	0.39
17	02-05-15	78	38	5.5	20.2	0.62	0.09	0.29
18	06-05-15	56	27	4.5	16.6	0.85	0.09	0.31
19	09-05-15	57	27	7.2	18.5	0.90	0.09	0.29
20	13-05-15	64	34	8.5	16.2	0.66	0.09	0.25
21	18-05-15	74	36	9.2	18.5	0.77	0.09	0.26
22	22-05-15	54	28	7.5	20.2	0.75	0.06	0.23
23	26-05-15	58	27	6.2	30.2	0.55	0.08	0.22

24	30-05-15	81	45	5.5	19.5	0.64	0.11	0.24

Table 4.5 : Detailed Ambient Air Quality results for Kathava Village, Summer 2015

Sample No.	Date	Results in µg/m^3				CO Results in mg/m^3		
		PM_{10}	$PM_{2.5}$	SO_2	NOx	Max.	Min.	Avg.
1	03-03-15	97	52	5.2	21.6	0.72	0.11	0.33
2	08-03-15	68	35	6.2	16.5	0.78	0.12	0.36
3	12-03-15	94	50	7.8	14.2	0.88	0.19	0.29
4	15-03-15	78	42	5.2	23.2	0.92	0.08	0.30
5	19-03-15	88	50	4.6	25.5	0.54	0.09	0.20
6	22-03-15	63	30	6.8	26.2	0.61	0.09	0.30
7	25-03-15	73	46	7.9	18.5	0.77	0.09	0.33
8	28-03-15	60	32	4.5	24.5	0.55	0.09	0.28
9	01-04-15	56	26	6.2	21.2	0.74	0.15	0.35
10	05-04-15	72	38	5.5	16.2	0.66	0.11	0.30
11	08-04-15	68	35	4.5	15.5	0.56	0.09	0.28
12	11-04-15	85	45	5.6	26.2	0.66	0.09	0.27
13	15-04-15	48	41	<4.0	20.2	0.66	0.09	0.23
14	20-04-15	54	45	6.2	18.5	0.63	0.06	0.29
15	23-04-15	62	36	5.5	21.2	0.65	0.07	0.22
16	27-04-15	67	28	4.5	30.2	0.88	0.08	0.26
17	02-05-15	81	31	5.2	16.6	0.75	0.09	0.29
18	06-05-15	87	22	<4.0	27.5	0.62	0.08	0.27
19	09-05-15	86	41	<4.0	15.5	0.75	0.08	0.29
20	13-05-15	96	48	<4.0	18.5	0.75	0.08	0.32
21	18-05-15	55	29	<4.0	23.2	0.74	0.09	0.30
22	22-05-15	48	26	6.3	24.2	0.85	0.08	0.30
23	26-05-15	73	34	6.2	15.5	0.90	0.09	0.29
24	30-05-15	88	48	8.5	26.6	0.68	0.09	0.33

ANNEXURE - 5: LIST OF ITEMS (OTHER THAN STEEL) RECOVERED FROM SHIPS

A. Petroleum Products & Chemicals				
Diesel	Fuel Oil	Lubricants	Hydraulic fluids	Pesticides
Refrigerants	Anti-freeze / Anti seize chemicals	Sacrificing anodes	Boiler additives	Electrolytes
Detergents	Cleaning chemicals & solvents	Industrial Gases		
B. Industrial Materials				
Paints	Asbestos & Asbestos Containing Materials	PVC tubes / sheets	Dunnage wood	Cardboard
Cotton rags	Rubber packing and tubes	Window panes	Glass sheets	Gas cylinders
Drums	Miscellaneous metallic items	Polystyrene sheets	Metal pipes and valves	Steel wool
Nuts & Bolts	Fibre glass / reinforced plastic items	Poly-urethane foam	Glass wool	
C. Electrical Machinery and Appliances				
Generators	Motors	Fans and Blowers	Circuit Breakers	Cables
Contactors	Electrical welding equipment	Transformers	Fuses and Fuse boxes	Batteries
Switches	Lighting equipment	Portable lights	Panel boards	Accumulators
D. Machinery				
Winches	Pumps	Compressors	Lathes	Cranes
Grinders	Ships' Main & Auxiliary engines	Engine Spares	Machinery Spares	Boilers
Bearings	Air conditioning plants	Water treatment plants	Gears & Gear Boxes	Oil sumps
E. Tools and Tackle				
Gas cutters	Leather gloves	Ships' anchors	Polypropylene Ropes	Brushes
Wire ropes	Pulleys & pulley blocks	Hand tools	Compressed air tools	Chains
Electrical tools	Rubber fenders			
F. Safety Equipment / Appliances				
Life boats	Survival suits	Floatation rings	Life jackets & belts	Helmets
Safety Boots	Fire fighting suits and equipment	Welding goggles	Fire extinguishers	Gas masks
	Breathing apparatus	Safety goggles		
G. Communication Equipment & Accessories				
Telephones	Marine trans-receiver sets (*Smashed by Customs soon after beaching)*	PA systems	FAX Machines	
H. Navigation Equipment & Accessories				
Compasses	GPS systems	Radar sets	Navigation Charts	Flags
Chronometers	Signaling and Navigation lights	Distress signals & flares	Search-lights	Fog Horns
I. Domestic Wares and Electro-mechanical appliances				
Photo-copiers	TVs, Music systems, Video Players	Refrigerators	Washing Machines	Buckets
Furniture	Personal Computers & accessories	Vacuum Cleaners	Mattresses & linen	Dish washers
Food items	Kitchen utensils & Crockery	Carpets & Linoleum	Books & magazines	
Cabin fittings	Cooking & food processing appliances	Bathroom Fittings	Water coolers	
Ceramic tiles	Show pieces & decorative items	Gymnasium eqpt.		
J. Miscellaneous				
Stationery	Technical Documents & Books	Ships' Documents	Domestic Detergents	

(Source: Report "Pollution Potential of Ship Breaking Activities" prepared by MECON Ltd. for CPCB in 2001)

ANNEXURE 6: RESULTS OF EFFLUENT ANALYSIS

Sl. No.	Characteristics	Norms	Results		
			E1 (Ballast Water)	E2 (Bilge Water)	E3 (Treated Effluent)
1	Colour, Hazen units	All efforts should be made to remove colour and unpleasant odour as far as practicable	<1.0	<1.0	<1.0
2	Odour		Unobjectionable	Unobjectionable	Unobjectionable
3	Suspended Solids, mg/l	100	223.9	435.8	14.2
4	Temperature, ^{O}C	Shall not exceed 5 ^{O}C above receiving water temperature	29 (+ 2)	30 (+ 3)	29
5	pH	5.5-9.0	7.34	7.27	7.03
6	Oil & Grease, mg/l	20 #	<1.4	5.6	<1.4
7	Ammoniacal nitrogen (as N), mg/l, Max	50	0.16	17.1	4.4
8	Total Kjeldahl nitrogen (as N), mg/l,	100	0.19	26.7	13.4
9	Free ammonia (as NH_3), mg/l	5	<0.1	14.2	0.58
10	Biochemical oxygen demand (3 days at 27ºC), mg/l	100	37.6	133	38.2
11	Chemical Oxygen Demand	250	129	439.5	161.3
12	Arsenic (as As), mg/l	0.2	<0.01	<0.01	<0.01
13	Mercury (as Hg), mg/l	0.01	<0.001	<0.001	<0.001
14	Lead (as Pb), mg/l	2.0	0.11	<0.005	<0.005
15	Cadmium (as Cd), mg/l	2.0	0.062	0.099	<0.001
16	Hexavalent chromium (as Cr^{+6}), mg/l, Max	1.0	<0.01	<0.01	<0.01
17	Total chromium (as Cr), mg/l	2.0	<0.01	0.017	<0.01
18	Copper (as Cu), mg/l	3.0	0.1	0.195	<0.02
19	Zinc (as Zn), mg/l	15	0.04	3.09	0.02
20	Selenium (as Se), mg/l	0.05	0.009	0.012	<0.005
21	Nickel (as Ni), mg/l	5.0	0.19	0.35	<0.02
22	Cyanide (as CN), mg/l	0.2	<0.001	<0.001	<0.001
23	Fluoride (as F), mg/l	15	1.36	1.14	1.23
24	Nitrate Nitrogen, mg/l	20	<0.1	<0.1	0.47
25	Sulphide (as S), mg/l	5.0	<0.1	<0.1	<0.1
26	Phenolic compounds (as C_6H_5OH), mg/l	5.0	<0.001	<0.001	<0.001
27	Dissolved Phosphate (as P), mg/l	-	0.17	<0.05	<0.05
28	Manganese (as Mn), mg/l	2	0.14	7.82	0.12
29	Iron (as Fe), mg/l	3	1.8	6.99	0.13
30	Vanadium (as V), mg/l	0.2	<0.2	<0.2	<0.2
31	Total resiudual chlorine, mg/l	1.0	<0.1	<0.1	<0.1
	# Regulation 9 of Annex I of MARPOL 73 / 78 stipulates maximum limit of 15 mg/l in undiluted effluent				

ANNEXURE 7: COMPOSITION OF WASTES

Table: Wastes, Substances of Concern and Disposal Options

Main items of ship	Substances of concern	Appropriate Disposal Option of substances of concern
Gaseous Wastes		
AC Systems, Chilling systems	Refrigerants (CFCs), Ammonia	Recovery by authorized agencies
Firefighting systems	CO_2 cylinders, halons	Recovery by authorized agencies
Cargo tanks and pipelines of oil / chemical tankers, gas carriers	Hydro-carbon gases / chemical fumes	Usually the tanks are purged with inert gas (normally nitrogen) and made gas free when the ship is still far off-shore
Liquid wastes		
Cargo tanks of oil tankers	Residual cargo, oily sludge	Re-use / re-refining / recycling by authorized agencies
Ballast water tanks	Invasive organisms, Oil	Ballast water exchange in high seas, shore based oily water treatment facilities
Bilge spaces	Oil	On-board or shore based oily water treatment facilities
Slop tanks of tankers	Oil, chemicals mixed with water	Shore based oily water treatment facilities
Fuel tanks, Oil sumps, Hydraulic systems	Fuel oil, lubricants, oils	Re-use / re-refining / recycling by authorized agencies
	Sludge	Incineration, disposal in secured land fill
	Wash water	Shore based oily water treatment facilities
Solid Wastes		
Bulk-heads	Asbestos and Asbestos Containing Material (ACM)	Re-use, Disposal in secured land fill after solidification / stabilization
Heat exchangers		
Insulated pipes, valves, gaskets		
Paint chips	PCBs, Lead, Chromium, Copper, Tributyl tin (TBT)	Disposal in secured land fill
Electrical equipment	PCBs, Lead, Beryllium, PVCs, Copper, Cadmium, Mercury, Antimony, Hexavalent Chromium, Octabromodiphenyl ether (OBDE), Tetrabromo-bisphenol A (TBBPA) etc.	Incineration at high temperature (~1650^{o}C). Disposal in secured land fill after solidification / stabilization. Recycling of lead through authorized recyclers.
Cargo holds	Residual cargo	Disposal in secured land fill
Instruments	Mercury, radioactive materials in smoke detectors	Recovery by distillation; residues disposed off in secured landfills. Radioactive sources disposed as per AERB guidelines

ANNEXURE 8: ONLINE MONITORING RESULTS OF ANALYSIS OF GASES OF INCINERATOR STACK

ONLINE GAS ANALYSER READING NOVEMBER 2014

Date	O2 (%)	CO2 (%)	CO (mg/Nm3)	SO2 (mg/Nm3)	NO (mg/Nm3)	NO2 (mg/Nm3)	HCL (mg/Nm3)	HF (mg/Nm3)	HC (mg/Nm3)	CL2 (mg/Nm3)	DUST (mg/Nm3)
01-11-2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02-11-2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
03-11-2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04-11-2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
05-11-2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
06-11-2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
07-11-2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
08-11-2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
09-11-2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10-11-2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11-11-2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12-11-2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13-11-2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14-11-2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15-11-2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16-11-2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17-11-2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18-11-2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19-11-2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20-11-2014	12.47	3.97	13.83	55.17	30.04	129.38	0.00	0.00	2.33	0.79	16.21
21-11-2014	12.88	3.86	15.04	49.38	29.00	146.75	0.00	0.00	2.67	0.88	15.88
22-11-2014	12.83	3.90	14.92	48.92	26.79	149.96	0.00	0.00	2.42	0.88	18.04
23-11-2014	12.27	3.86	14.67	47.71	27.20	132.25	0.00	0.00	2.33	0.75	15.20
24-11-2014	12.36	4.00	15.21	56.46	28.54	144.37	0.00	0.00	2.41	0.79	15.70
25-11-2014	12.37	3.88	15.17	51.75	29.50	143.58	0.00	0.00	2.37	0.75	15.05
26-11-2014	12.89	3.91	15.83	39.17	27.29	144.45	0.00	0.00	2.66	0.66	14.55
27-11-2014	12.82	3.70	15.71	51.54	27.50	145.87	0.00	0.00	2.62	0.70	15.12
28-11-2014	12.94	3.79	15.42	48.54	28.50	141.12	0.00	0.00	2.83	0.87	16.66
29-11-2014	13.02	3.90	15.00	49.08	30.17	139.66	0.00	0.00	2.66	0.83	15.45
30-11-2014	12.80	3.92	15.11	36.67	24.96	135.62	0.00	0.00	2.71	0.79	15.79

OPERATION DAYS : 11

ONLINE GAS ANALYSER READING DECEMBER 2014

Date	O2 (%)	CO2 (%)	CO (mg/Nm3)	SO2 (mg/Nm3)	NO (mg/Nm3)	NO2 (mg/Nm3)	HCL (mg/Nm3)	HF (mg/Nm3)	HC (mg/Nm3)	CL2 (mg/Nm3)	DUST (mg/Nm3)
01-12-2014	12.93	4.00	15.25	50.79	25.79	139.71	0.00	0.00	2.88	0.83	15.67
02-12-2014	13.13	3.82	15.92	51.04	29.00	140.11	0.00	0.00	2.71	0.89	15.90
03-12-2014	13.47	4.07	15.66	50.92	29.07	141.06	0.00	0.00	2.83	0.87	15.78
04-12-2014	13.01	3.98	15.78	50.67	28.66	140.22	0.00	0.00	2.80	0.83	15.83
05-12-2014	12.87	3.66	15.51	50.98	28.79	140.97	0.00	0.00	2.89	0.88	15.66
06-12-2014	12.49	3.42	15.24	51.07	28.5	140.29	0.00	0.00	2.66	0.81	15.41
07-12-2014	13.04	3.71	14.98	50.99	28.65	140.81	0.00	0.00	2.65	0.88	15.6
08-12-2014	12.15	3.49	14.89	50.68	28.41	139.62	0.00	0.00	2.71	0.83	15.32
09-12-2014	12.48	3.9	15.04	50.17	27.97	139.47	0.00	0.00	2.92	0.87	14.98
10-12-2014	12.67	4.01	15.22	49.99	27.79	139.78	0.00	0.00	2.66	0.69	14.71
11-12-2014	13.00	4.15	15.17	49.87	26.7	140.23	0.00	0.00	2.60	0.72	14.6
12-12-2014	12.6	4	15.42	50.13	27.42	140.6	0.00	0.00	2.44	0.79	14.87
13-12-2014	12.87	3.92	15.11	50.91	27.07	139.01	0.00	0.00	2.32	0.72	14.99
14-12-2014	13.11	3.88	15.03	50.77	27.63	138.66	0.00	0.00	2.50	0.77	15.07
15-12-2014	13.49	4.03	15.07	50.49	27.42	138.82	0.00	0.00	2.57	0.9	15
16-12-2014	13.15	4.18	14.88	51.00	27.77	138.97	0.00	0.00	2.90	0.88	14.78
17-12-2014	12.4	3.57	14.93	50.94	26.9	138.42	0.00	0.00	2.81	0.84	14.91
18-12-2014	12.89	3.84	14.66	51.61	26.13	138.6	0.00	0.00	2.75	0.68	14.66
19-12-2014	12.98	3.72	15.09	50.88	25.66	139.09	0.00	0.00	2.79	0.75	14.5
20-12-2014	12.66	3.91	15.91	49.32	24.58	137.97	0.00	0.00	2.50	0.87	14.24
21-12-2014	12.41	4.07	15.62	48.68	24.8	136.73	0.00	0.00	2.63	0.81	14.17
22-12-2014	12.75	4.21	15.21	47.88	25.09	137.21	0.00	0.00	2.91	0.83	14.39
23-12-2014	13.00	4.1	15.03	47.6	25.47	137.49	0.00	0.00	2.66	0.83	14.58
24-12-2014	12.67	3.77	14.9	47.91	25.59	138	0.00	0.00	2.84	0.87	14.01
25-12-2014	12.95	3.59	14.73	47.06	26.04	137.91	0.00	0.00	2.88	0.92	13.99
26-12-2014	13.09	3.68	14.97	45.99	25.99	138.07	0.00	0.00	2.80	0.9	14.18
27-12-2014	13.42	3.79	15.39	42.56	25.69	138.51	0.00	0.00	2.74	0.96	14.97
28-12-2014	13.98	3.57	15.63	39.50	25.48	138.69	0.00	0.00	2.70	0.87	15.02
29-12-2014	14.52	3.78	15.51	40.97	25.11	138.55	0.00	0.00	2.92	0.79	15.79
30-12-2014	13.46	3.8	15.29	41.29	24.54	140.05	0.00	0.00	2.59	0.88	16.46
31-12-2014	12.38	3.89	15.96	41.88	25.02	140.37	0.00	0.00	2.54	0.83	15.17

OPERATION DAYS : 31

ONLINE GAS ANALYSER READING JANUARY 2015

Date	O2 (%)	CO2 (%)	CO (mg/Nm3)	SO2 (mg/Nm3)	NO (mg/Nm3)	NO2 (mg/Nm3)	HCL (mg/Nm3)	HF (mg/Nm3)	HC (mg/Nm3)	CL2 (mg/Nm3)	DUST (mg/Nm3)
01-01-2015	12.38	3.92	13.83	55.17	30.04	134.75	0.00	0.00	2.25	0.83	16.21
02-01-2015	12.49	4.02	15.04	49.29	29.00	146.42	0.00	0.00	2.75	0.88	15.88
03-01-2015	12.53	3.94	14.92	47.00	27.21	144.00	0.00	0.00	2.42	0.88	17.08
04-01-2015	12.55	3.69	15.71	37.63	24.88	138.33	0.00	0.00	2.33	0.83	16.73
05-01-2015	12.84	3.96	15.71	38.33	24.88	140.21	0.00	0.00	2.67	0.82	15.79
06-01-2015	12.69	3.79	15.58	41.04	24.63	141.38	0.00	0.00	2.54	0.88	16.01
07-01-2015	13.11	3.77	15.42	39.67	25.01	143.66	0.00	0.00	2.33	0.79	18.75
08-01-2015	12.10	3.61	15.42	38.33	24.97	139.9	0.00	0.00	2.46	0.88	16.58
09-01-2015	13.00	3.74	15.96	38.91	25.13	139.83	0.00	0.00	2.67	0.83	16.9
10-01-2015	12.58	3.5	14.88	41.43	25.00	141.28	0.00	0.00	2.67	0.79	16.58
11-01-2015	12.64	3.7	15.54	40.21	25.42	141.92	0.00	0.00	2.75	0.88	17.29
12-01-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13-01-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14-01-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15-01-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16-01-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17-01-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18-01-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19-01-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20-01-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21-01-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22-01-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23-01-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24-01-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25-01-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26-01-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27-01-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28-01-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29-01-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30-01-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31-01-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

OPERATION DAYS : 11

ONLINE GAS ANALYSER READING FEBRUARY 2015

Date	O2 (%)	CO2 (%)	CO (mg/Nm3)	SO2 (mg/Nm3)	NO (mg/Nm3)	NO2 (mg/Nm3)	HCL (mg/Nm3)	HF (mg/Nm3)	HC (mg/Nm3)	CL2 (mg/Nm3)	DUST (mg/Nm3)
01-02-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02-02-2015	12.56	3.68	15.46	44.88	25.54	141.08	0.00	0.00	2.67	0.92	16.67
03-02-2015	12.98	4.01	15.21	48.83	25.08	140.83	0.00	0.00	1.83	0.88	15.71
04-02-2015	13.01	3.90	15.04	40.63	25.29	141.83	0.00	0.00	2.33	0.92	15.21
05-02-2015	13.04	3.91	15.21	46.96	25.25	142.79	0.00	0.00	1.92	0.83	14.79
06-02-2015	13.05	4.09	14.79	45.42	25.33	145.21	0.00	0.00	2.17	0.79	20.21
07-02-2015	12.98	4.07	15.42	40.96	25.38	144.17	0.00	0.00	2.17	0.79	15.71
08-02-2015	12.84	4.03	15.21	41.50	25.33	140.67	0.00	0.00	2.29	0.88	15.33
09-02-2015	13.07	4.06	14.92	46.83	25.29	145.38	0.00	0.00	2.08	0.79	16.92
10-02-2015	13.08	4.02	15.25	42.83	25.33	141.58	0.00	0.00	2.33	0.71	15.75
11-02-2015	13.19	4.05	14.67	41.83	24.88	144.79	0.00	0.00	2.04	0.83	15.17
12-02-2015	13.03	3.97	14.54	44.04	24.79	143.25	0.00	0.00	2.13	0.71	16.21
13-02-2015	12.97	4.02	15.13	46.04	25.00	142.50	0.00	0.00	2.00	0.79	17.04
14-02-2015	12.94	3.94	14.92	38.50	25.04	132.42	0.00	0.00	2.54	0.79	15.79
15-02-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16-02-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17-02-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18-02-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19-02-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20-02-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21-02-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22-02-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23-02-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24-02-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25-02-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26-02-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27-02-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28-02-2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

OPERATION DAYS : 13

ANNEXURE 9: IMPACTS ON AIR QUALITY

Table: Cumulative Impact at AAQ monitoring stations

AAQ Station	PM_{10}			SO_2			NOx		
	Monitored	Predicted	Total	Monitored	Predicted	Total	Monitored	Predicted	Total
Alang Fire Stn.	79.8	0.30	80.10	7.3	0.45	7.75	31.7	0.43	32.13
Alang Village	77.2	0.14	77.34	7	0.21	7.21	22.8	0.99	23.79
Sosiya	73.7	0.07	73.77	6.1	0.10	6.20	20.5	0.24	20.74
Mathavda	67	0.17	67.17	6.3	0.26	6.56	21.4	0.24	21.64
Kathava	72.8	1.02	73.82	5.5	1.53	7.03	21.2	0.84	22.04
All values in µg/m^3.									

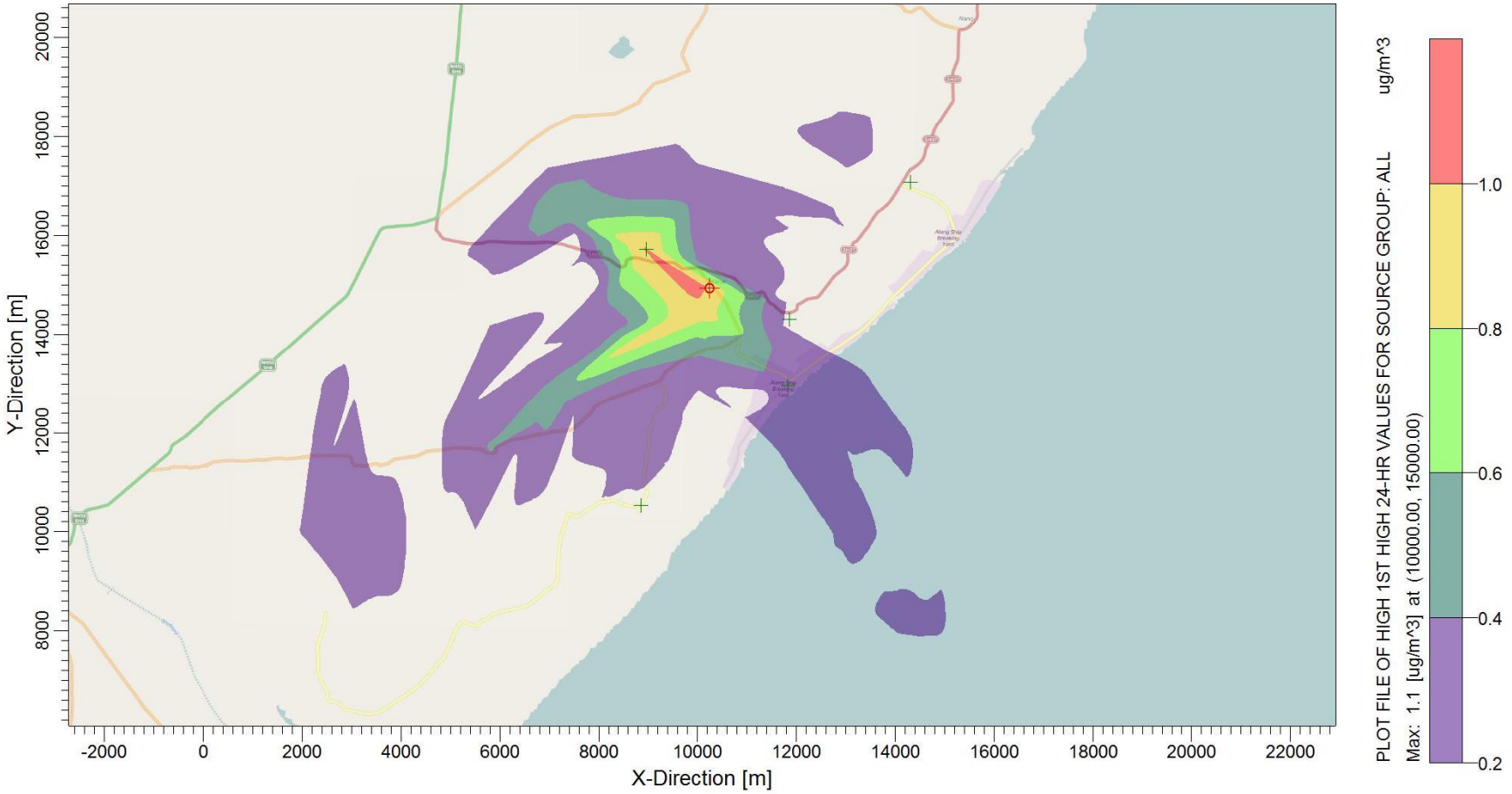


Fig. 9a: Isopleths of PM_{10} Dispersion due to Proposed New Incinerator

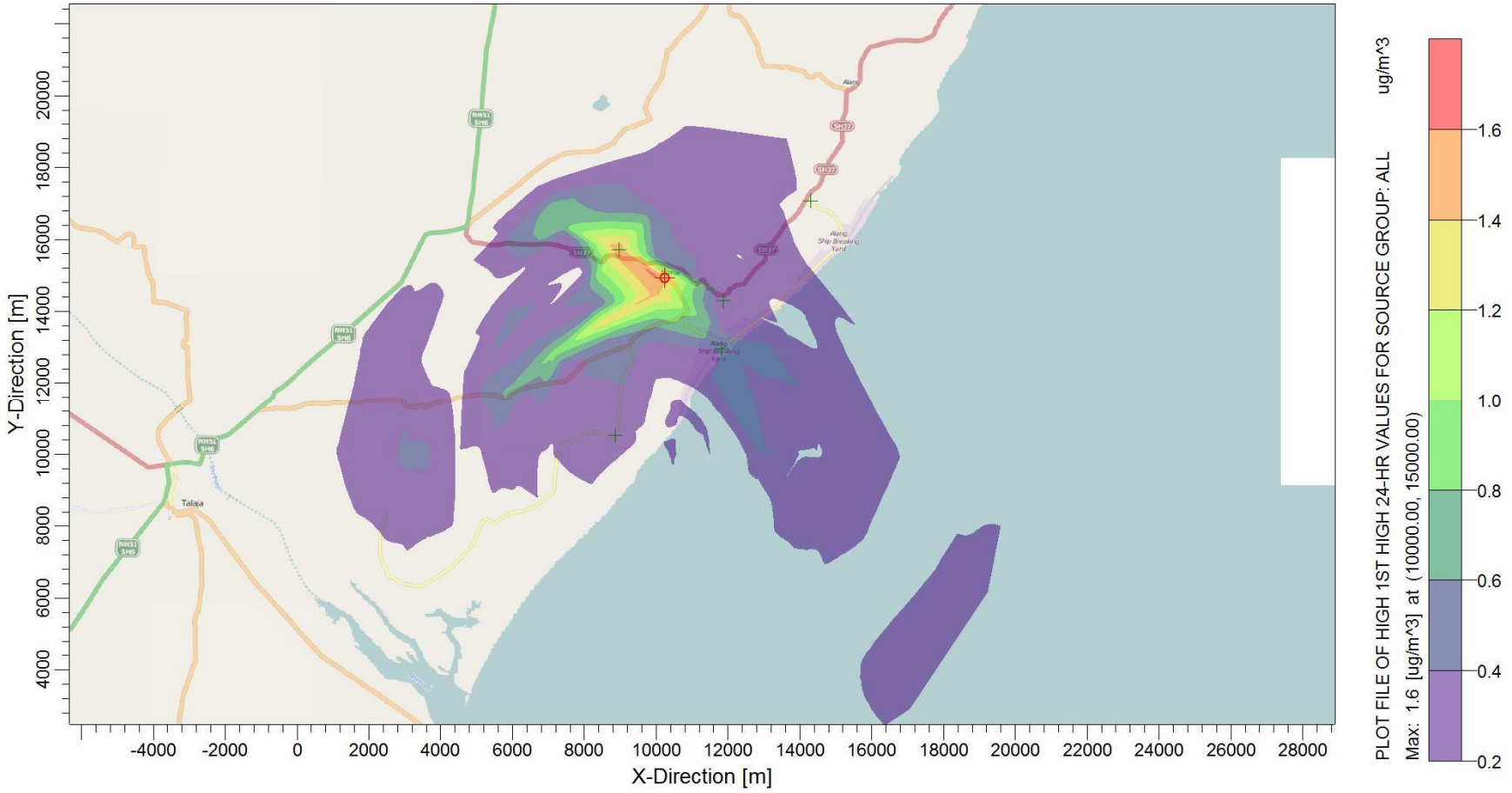


Fig. 9b: Isopleths of SO_2 Dispersion due to Proposed New Incinerator

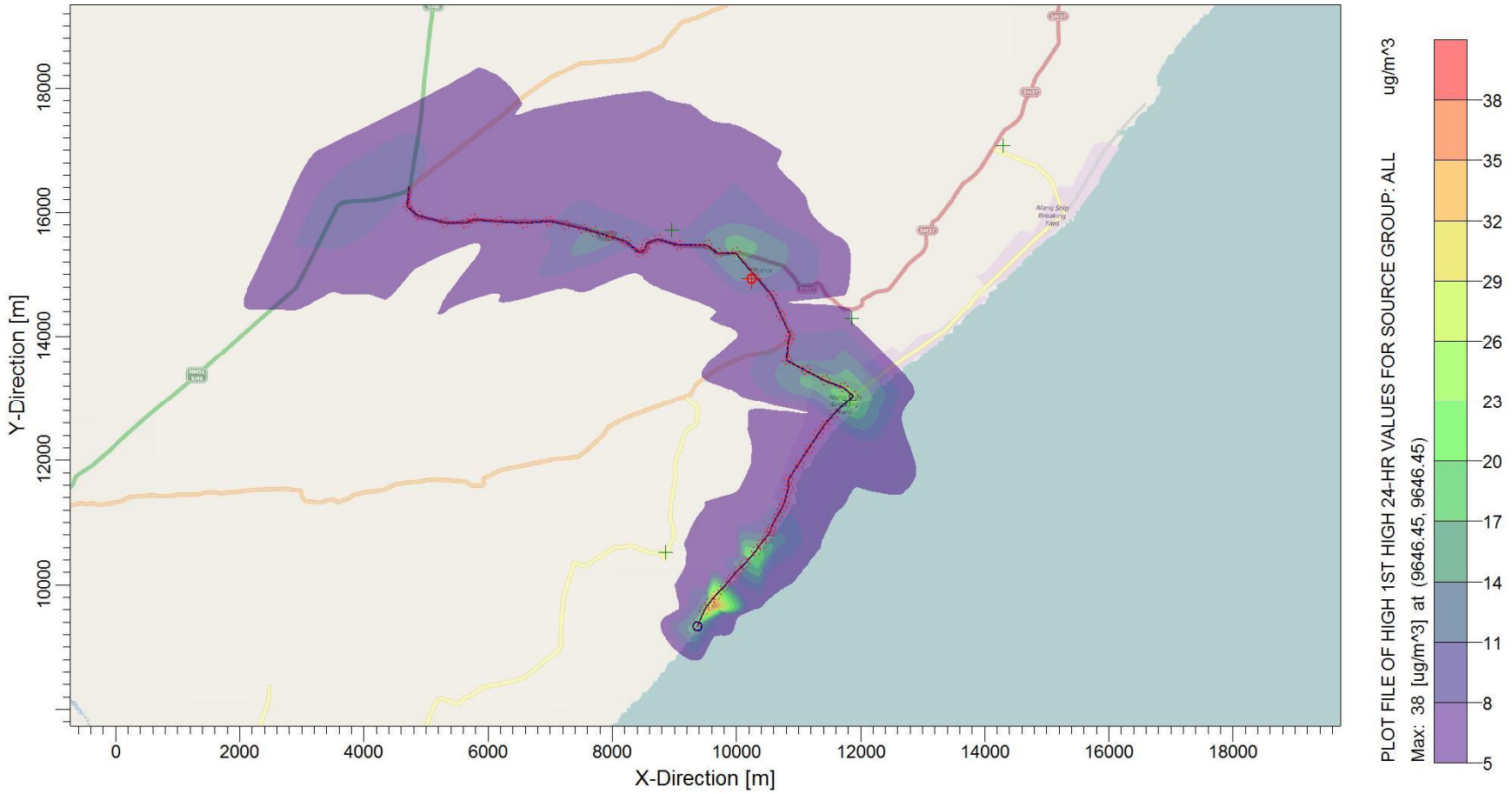


Fig. 9c: Isopleths of cumulative NOx Dispersion due to Proposed Project

ANNEXURE - 10: DETAILS OF SAFETY MEASURES

Each Plot has a dedicated Safety Officer. He is usually assisted by one or more Safety Supervisors depending on the magnitude of operations of the plot. The new plots will also have similar arrangements. GMB's Alang Office has a Safety Department whose officers supervise the plots' safety departments. Each of the new Dry Docks will have its own Safety Officer and one or more Asst. Safety Officers. The Safety Department on each plot has multi gas meters to check for presence of inflammable and toxic gases.

The Safety Officer is responsible for the purchase and issue of all personal protective equipment (PPE) e.g. shoes, helmets, various types of gloves, aprons, dust respirators, ear plugs, goggles etc. taking employee strength into consideration and distributed to both company employees and contractors' employees. The Asbestos Removal Supervisor is responsible for purchase and issue of PPEs to asbestos workers. Safety boots are issued every 6 months, helmets every 3 years and other PPEs as per requirement. If any PPEs are damaged before their scheduled replacement, fresh equipment are issued.

The Safety Officers are responsible for issue of all necessary safety equipment to the workers. The Safety Officers and their deputies ensure the following:

- No worker carries mobile phone to his work place lest he be distracted by attending to phone calls while working.
- All workers and visitors wear safety helmets in working areas
- All workers wear safety boots.
- All workers engaged in gas cutting wear welders' goggles, gloves and masks
- Workers engaged in abrasive work, wear goggles and masks
- Workers engaged in handling heavy items and glass wear gloves.
- Operators of heavy diesel powered machinery are issued ear plugs / ear muffs.
- Enclosed spaces on board the ships are free of flammable, suffocating and toxic gases / vapours. If any such gases are present in concentrations which may pose a threat to workers' safety, the spaces shall be purged with air till they are safe for entry of workers and for working.
- There are no inflammable liquids or gasses inside pipelines or across bulk-heads which are being cut with torches
- Cables, chains used for winching ships undamaged and rated for the weight of the ship concerned.
- Unconcerned personnel are at safe distance during winching of ships.
- The LPG godown is maintained as per guidelines.
- All LPG cylinders are kept in an upright position.
- All torches and LPG cylinders' regulators are put in "off" position at end of work or during work breaks.
- Nobody is smoking or there is any open flame nearby when fuel is being unloaded from ships.
- There are adequate number of fire fighting systems on the plots and they are in working order.
- All hazardous wastes are carefully documented, packed and stored in the designated area.
- Heavy material handling machinery give audio-visual warnings while moving heavy loads.
- Life buoys are kept on ships for use during emergency evacuation in case of major fire
- Workers working at heights are provided with safety belts / harnesses.
- All other general safety rules and guidelines are followed.

The ship recycling yard has its own dedicated well equipped centralised Fire Station located approximately in the middle of the yard. The existing resources of the fire-station are being augmented. Mock drill are periodically conducted under the supervision of experts.

All new recruits are given basic training on safety before being actually sent to work place. This training is conducted at GMB's Training Centre and is spread over three days. Additional safety training is given to those engaged in gas cutting, winch operations, crane operations, handling of engine room, handling of glass wool and handling of fuel oil & lubricants. All workers also undergo refresher training on safety. Certificates are issued on successful completion of training courses.

APPENDIX

REGIONAL OFFICE
GUJARAT POLLUTION CONTROL BOARD
PLOT NO: 1154/2-B, GHOGHA CIRCLE, SIR PATTANI ROAD,
BHAVNAGAR-364 002
PHONE: 2524108 FAX: 2525837

Ref. GPCB/RO/BHV-1777/ 1862 /2015. DATE: 29 OCT 2015

To,
The Member Secretary,
Gujarat Pollution Control Board,
Sector 10- A,
Gandhinagar.

Sub: Proceeding of Public Hearing for M/s Gujarat Maritime Board.

Respected Sir,

Please find enclosed herewith the proceeding of public hearing of M/s Gujarat Maritime Board has proposed for upgradation of existing Recycling Yard at Alang Sosiya, Gujarat for undertaking safe and environmentally sound ship-recycling operations which was held on 20.10.2015 at 11:00 am at Training & Welfare Complex, Gujarat Maritime Board, Alang, Ta: Talaja, Dist: Bhavnagar. This is for your perusal and necessary action please.

Thanking You,

For and on behalf of
Gujarat Pollution Control Board

(R.R.Vyas)
Regional Officer

Encl: As Above

Copy to:

1. The Collector & District Magistrate
   Collector Office, Bhavnagar...for display of the above minutes
2. The District Development Officer
   District Panchayat Office, Bhavnagar...for display of the above minutes
3. Talati cum Mantri,
   Village Panchayat of the village: **Alang**, Tal: **Talaja**, Dist: Bhavnagar...for display of the above minutes.

PUBLIC HEARING PROCEEDINGS

It is informed that as per the Ministry of Environment & Forests, Govt, of India, New Delhi vide its Notification No S.O. 1533 dated September 14, 2006 as amended. Public Hearing was fixed for the following projects covered under Category 7(B), M/s Gujarat Maritime Board has proposed for upgradation of existing Recycling Yard at Alang Sosiya, Gujarat for undertaking safe and environmentally sound ship-recycling operations at Tal: Talaja, Dist: Bhavnagar. The Public Hearing is being held on **20.10.2015** at **11:00** am at **Training & Welfare Complex, Gujarat Maritime Board, Alang, Ta: Talaja, Dist: Bhavnagar**, **Gujarat** as mentioned in their request application received.

A copy of the draft Environment Impact Assessment report and the Summary Environment Impact Assessment Report was sent to the following authorities or offices to make available the draft EIA Report for inspection to the public during normal office hours, till the Public Hearing is over.

1. The District Collector Office, Bhavnagar
2. District Development Officer, Bhavnagar
3. District Industry Centre, Bhavnagar
4. The Chief Conservator of Forests, Ministry of Environment & Forests, Government of India, Regional Office, West Zone, Kendriya Paryavaran Bhavan, E-5 Arera Colony, Link Road-3, Ravisankar Colony, Bhopal 462 016.
5. Regional Office, GPCB, Bhavnagar.

Other concerned persons having plausible stake in the environment aspects were requested to send their response in writing to the concerned regulatory authorities. They were requested to send their comments to be regulatory authorities as under:

Central Government in MoEF (Ministry of Environment & Forests, Gol, CGO Complex, Lodi Road, New Delhi 110 003) for the matter falling under Category A of schedule of aforesaid Notification.

The Public Hearing was scheduled on 20.10.2015 at 11:00 hrs at **Training & Welfare Complex, Gujarat Maritime Board, Alang, Ta: Talaja, Dist: Bhavnagar, Gujarat** an advertisement in English was published in The Western Times, dated 18.09.2015 and that in Gujarati was Sandesh dated 18.09.2015.

The District Magistrate, Bhavnagar supervised and presided over the entire public hearing process.

A statement showing participants present during the public hearing is enclosed as **Annexure-A.**

A statement showing issues raised by the participants and responded by the representative of the applicant during the public hearing is enclosed as **Annexure-B.**

A Statement showing issues raised by other concerned persons having plausible stake in the environment aspects and responded by the representative of the applicant is enclosed at **Annexure C** and **Annexure D** respectively.

Place:

Training & Welfare Complex,
Gujarat Maritime Board,
At: Alang, Ta: Talaja,
Dist: Bhavnagar, Gujarat

R R Vyas
Regional Officer, GPCB

Banchhanidhi Pani
District Magistrate & Collector, Bhavnagar

End: 1. Annexure A, B (English & Gujarati), C (C1 to C12), D (D1 to D12) & Video CD of PH

Annexure-A

A Statement showing participants present during the Public Hearing

As per the Ministry of Environment & Forest, Government of India, New Delhi vide its Notification no. S.O. 1533 dated Sept.14, 2006; Public hearing is fixed for following project covered under category 7(b). Gujarat Maritime Board has proposed for upgradation of existing Recycling Yard at Alang Sosiya, Gujarat for undertaking safe and environmentally sound ship-recycling operations. The Public Hearing is being held on 20.10.2015 at 11:00 am at Gujarat Maritime Board, Training & Welfare Complex, Alang, Ta:- Talaja, Dist:- Bhavnagar.

The list showing participants present during the Public Hearing is as follows.

ભારત સરકાર ના પર્યાવરણ અને વન મંત્રાલય, નવી દિલ્હી ના જાહેરનામા ક્રમાંક : S.O. 1533 તા: 14/09/2006 તેમજ વખતોવખત થયેલ સુધારાના અનુસંધાને મેસર્સ ગુજરાત મેરીટાઇમ બોર્ડ. કેટેગરી – 7(બી) માં સમાવિષ્ટ સલામત અને પર્યાવરણીય સુસંગત જહાજ રીસાયકલિંગ પ્રક્રિયા માટે હયાત અલગ સોસિયા જહાજ રીસાયકલિંગ યાર્ડમાં આધુનિકરણની સુચિત યોજના માટેની લોકસુનાવણી ગુજરાત મેરીટાઇમ બોર્ડ, ટ્રેઇનીંગ અને વેલ્ફેર કોમ્પ્લેક્ષ, અલંગ, તાલુકા: તળાજા, જીલ્લો: ભાવનગર ખાતે તારીખ 20.10.2015 ના રોજ, સવારે 11:00 કલાકે રાખવામાં આવેલ.

લોક સુનાવણી દરમ્યાન હાજર રહેલ લોકોની યાદી નીચે મુજબ છે.

Sr No અનુક્રમાંક નં	Name & Address નામ અને સરનામુ	Signature સહી
1	જીતેન્દ્ર કુમાર ચૌધરી ~~ગામ બલાદહી~~ → સોસિયા 127	જીતેન્દ્ર
2	જોગેન્દ્ર રામ સોસિયા 128	જોગેન્દ્ર રામ
3	રમેશભાઈ જાદવ અલંગ	—

4	S. K. Gupta	
5	Santosh Gupta	
6	Bagwat	
7	Shekh Gafgur	
8	Ukhilesh Yadav	
9	Shekhar	
10	Kunchan Parasar	
11	Ashok Kumar	
12	Shoket Gopal	
13	Pant Lal Yadav	
14	Shekh Jamal	
15	Pujan Ram	
16	Ayshan	
17	Raju	

18	Avanish H Buraiya (Samadhiyala)	[illegible]
19	[illegible] ([illegible])	[illegible]
20	[illegible] ([illegible])	[illegible]
21	Gujariya Munesh. N (Poterpura)	MGujariya
22	Kanodiya Vipul (Isora)	[illegible]
23	Devang Joshi (Manas)	Joshi
24	U.B Bhatt	[illegible]
25	Sanjay L [illegible] ([illegible])	[illegible]
26	JITENDRASHINH J. GOHIL (ALANG)	J.J.GOHIL
27	DHARMENDRASHINH D. GOHIL ([illegible])	D G GOHIL
28	[illegible] ([illegible])	[illegible]
29	[illegible] ([illegible])	[illegible]
30	Jaydip R [illegible] (Isora)	J.R[illegible]
31	[illegible] B. Gohel [illegible] ([illegible])	[illegible]

32	Solanki Lalji. B (Prithivizoli)	[signature]
33	Bavaiya Vajubhai. V (Bela)	V. V. BAVAYA
34	Sivaji Rana (Manus)	[signature]
35	Gohil Lagdhirsinh R. (Lavasinhpura)	[signature]
36	Solanki Jagdishbhai Ghelabhai	[signature]
37	Gohil Jitendrasin Manghsinh	[signature]
38	Makvana Liliben Jinabhai	[signature]
39	Bhavin Shah	[signature]
40	Parth Vora	[signature]
41	Jaydevsinh. A. Gohil	[signature]
42	[illegible]	[illegible]
43	Gohil Jaypalsinh [illegible]	[signature]
44	Parmar Haresh G - Alayand	[signature]
45	Manoj Shah.	[signature]

46	Bhadresh Shah	
47	Hiren Shah	
48	Amit Shah.	
49	Amit Dathawala	
50	Shital. V. Bhaya	S. V Bhaya
51	CHINTAN KALTHIA PLOT NO. 19.	
52	KIRAN PATEL PLOT. 46	
53	MEHUL KOTHARI PLOT No. 63 & 64.	
54	ROHIT AGARWAL	
55	Pranav. Vyas. Fire officer. Alang	
56	Sikandar	
57	Shadevram	
58	meglal mahto	
59	Prem narayan nisad	

60	कालु सिंह दीपा सोरनीया	Kalu singh Dipa
61	राजु - अलोंगा	Raju Mardai
62	मनोज - अलोगा	मनोज चौधरी
63	नागेश्वर यादव - अलोंगा	—
64	इन्द्रदेव नाथ - सोरनीया	
65	[illegible]	
66	[illegible]	
67	समसुद्दीन	समसुद्दीन अंसारी
68	S.K. Nezam	
69	[illegible] } [illegible]	
~~70~~		
~~71~~		
~~72~~		

પરીશિષ્ટ – બી

લોક સુનાવણીમાં ભાગ લેનાર સહભાગીઓ દ્વારા ઉઠાવાયેલ મુદ્દા અને પ્રોજેકટના પ્રતિનિધિ દ્વારા આપવામાં આવેલ પ્રત્યુતર.

ભારત સરકાર ના પર્યાવરણ અને વન મંત્રાલય , નવી દિલ્હી ના જાહેરનામા ક્રમાંક : S.O. ૧૫૩૩ તા: ૧૪/૦૯/૨૦૦૬ વખતો વખત સુધારા અ ન્વયે કેટેગરી - ૭ (બી) માં આવરી લેવાયેલા મેસર્સ **ગુજરાત મેરીટાઇમ બોર્ડ**. (કેટેગરી – ૭(બી) માં સમાવિષ્ટ), અલંગ (સી.ટી), ગામ: અલંગ-સોસીયા અને મથાવડા, તા: તળાજા, જી: ભાવનગર દ્વારા હયાત જહાજ રીસાયકલીંગ યાર્ડના સલામત અને પર્યાવરણીય સુસંગત આધુનીકરણની સુચિત પરિયોજનાની દરખાસ્ત કરેલ છે . લોકસુનાવણી તારીખ ૨૦.૧૦.૨૦૧૫ ના રોજ, સવારે ૧૧:૦૦ કલાકે **અલંગ (સી.ટી), ગામ: અલંગ-સોસીયા અને મથાવડા , તા: તળાજા, જી: ભાવનગર** ખાતે રાખવામાં આવેલ.

શ્રી આર.આર.વ્યાસ, પ્રાદેશિક અધિકારી, ભાવનગર, ગુજરાત પ્રદૂષણ નિયંત્રણ બોર્ડ તથા જાહેર સુનાવણી સમિતીના સભ્ય સચિવ દ્વારા સદર નોટીફીકેશન અંતર્ગત પર્યાવરણ મંજુરી મેળવવા માટેની જરૂરીયાત તથા આ સુચિત પ્રોજેક્ટની આસપાસ રહેતા લોકોને આ પ્રોજેકટ સંબંધીત રજુઆતો કરવા વિશે માહિતગાર કર્યા.

લોકસુનાવણી સમિતીના અધ્યક્ષસ્થાનેથી શ્રી . બંછાનીધી પાની , જીલ્લા કલેકટરશ્રી એ સદર નોટીફીકેશન અંતર્ગત લોકસુનાવણીની પ્રક્રિયા દરમ્યાન ઉપસ્થિત જનસમુદાયને સદર પ્રોજેક્ટ બાબતે તેમના સુચનો તથા વાંધાઓ મુક્ત રીતે રજુ કરવા જણાવ્યું તેમજ આ લોકસુનાવણીની અગત્યતા બાબતે સર્વેને માહિતગાર કર્યા.

ત્યારબાદ શ્રી આર.આર.વ્યાસે માનનીય જીલ્લા મેજીસ્ટ્રેટશ્રીની અનુમતીથી મેસર્સ **ગુજરાત મેરીટાઇમ બોર્ડ** ના પ્રતિનીધીને તેઓના સુચિત પ્રોજેકટ તેમજ તે અંગેના ડ્રાફ્ટ ઇ .આઇ.એ રિપોર્ટની વિગતો સંક્ષીપ્ત રૂપે રજુ કરવા જણાવ્યું.

મેસર્સ **ગુજરાત મેરીટાઇમ બોર્ડ** ના પ્રતિનિધિ દ્વારા હયાત જહાજ રીસાયકલીંગ યાર્ડના સલામત અને પર્યાવરણીય સુસંગત આધુનીકરણની સુચિત પરિયોજનાની વિશે સ્લાઇડ દ્વારા પ્રેઝેન્ટેશન કરીને રજૂઆત કરવામાં આવી.

કંપની દ્વારા તેમનું પ્રેઝેન્ટેશન પૂર્ણ થયા બાદ આ લોકસુનાવણીમાં હાજર રહેલ લોકોમાંથી રજુઆત કરવા ઇચ્છતા તમામને રજુઆત કરવા માટે લોકસુનાવણીની આગળની કામગીરી જાહેર જનતા માટે ખુલ્લી મુકવામાં આવી.

લોકસુનાવણી દરમ્યાન હાજર રહેલ લોકો દ્વારા પુછવામાં આવેલ પ્રશ્નો તેમજ અરજદારના પ્રતિનિધિ દ્વારા આપવામાં આવેલ પ્રત્યુતર નીચે મુજબ છે.

ક્રમ	રજુઆત કરેલ મુદ્દા અને તેનું નામ	મેસર્સ એફકોન્સ ઇન્ફ્રાસ્ટ્રક્ચર લીમીટેડદ્વારા અપાયેલ પ્રત્યુતર	રિમાર્કસ
1.	નામ:- મકાભાઇ ગભુભાઇ વરૂ ગામ:- મણાર • અલંગ અને સોસીયા વિસ્તારમાં થતી રિસાઇકલીંગની કામગીરી થી કચરો ભુગર્ભ જળ માં ભળે છે તથા આરોગ્યને નુકશાન થાય છે આથી અમારો વિરોધ છે તેમજ આરોગ્ય માટે પ્રાથમિક સુવિધાઓનો અભાવ છે.	• છેલ્લા ૧૫ વર્ષથી દરા વર્ષે સેંટ્રલ સોલ્ટ મરીન કેમિકલ્સ રીસર્ચ ઇન્સ્ટીટ્યુટ તથા અન્ય ગણનાપાત્ર સંસ્થાઓ દ્વારા ભુગર્ભ જળના નમુનાઓની ચકાસણી કરવામાં આવે છે જેમાં કચરાનું પ્રમાણ માલુમ પડેલ નથી.	
2.	નામ:- ભાવીનભાઇ શાહ (પ્લોટ ધારક નં. ૬૮) ગામ:- અલંગ • અલંગ વિસ્તારમાં આવતી શીપની સંખ્યામાં હાલ ઘટાડો નોંધાયેલ છે, જે બાંગ્લાદેશ અને પાકિસ્તાનમાં કપાવા માટે જાય છે. પ્રોજેક્ટ કોસ્ટ વધશે તેમજ કોસ્ટ ઇકોનોમીકલ સ્ટડી કરવામાં આવ્યો છે?	• ડ્રાય ડોક બનાવવાની અને સુચિત આધુનિકરણ કરવાથી OECD દેશો તેમના જહાંજો રિસાઇક્લિંગ કરવાનાં હેતુથી અલંગ મોકલી શકશે. હાલ માં આ દેશ ના કાયદાઓ તેમને આમ કરવાથી રોકે છે. સુચિત આધુનિકરણથી સ્પેશ્યલ કેટેગરીના જહાજો નુ પર્યાવરણની દ્રષ્ટિએ સાનુકુળ રીતે રિસાઇક્લિંગ કરવાની કેપેસિટી વધશે, જેનાથી આ ઉધ્યોગ ને વેગ મળશે. સ્પેશ્યલ જહાજો PESO ના કાયદાઓ અંતર્ગત આવરી લેવાય છે.	• અધ્યક્ષસ્થાને થી જણાવવામાં આવેલ કે, અહીં માત્ર પર્યાવરણીય બાબતોને લગતા જ પ્રશ્નોની રજૂઆત કરવી.

	• પ્લોટમાં એમેન્ડમેંટ કરવાની વાત કરીએ છીએ પરંતુ, હાલમાં હયાત પ્લોટો માંથી ફક્ત ૩૦% – ૪૦% પ્લોટ ચાલે છે, વિશ્વમાં અલંગનો શેર દરવર્ષે ઘટતો જાય છે, અત્યારે જેટલા પ્લોટો તેની પાસે પુરતુ કામ નથી તો શું નવા પ્લોટો ડેવલોપ કરવા જરૂરી છે ? • શિપીંગ કંપનીઓ સરકાર જોડે વાતચીત કરે છે પરંતુ શિપ ભારત માં આવશે કે કેમ? • પ્રોજેકટ ડેવલોપીંગ પ્લાન બનાવતા પહેલા શિપ રીસાયક્લર્સ એસોસીએશન સાથે બેઠક કરવામાં આવે તેવું સુચન કરેલ.	• હાલમાં, ગ્લોબલ રીસેશન છે અને બીજા દેશોની સરખામણીમા ભારત માં મંદી ઓછી છે. અને આ પ્રોજેક્ટને પુરો થતા ૭ થી ૮ વર્ષ લાગશે. જે તબક્કાવાર પુર્ણ થશે. • અપગ્રેડેશન કર્યા પછી શીપની સંખ્યામાં વધારો થશે.	
3.	નામ:- હરેશભાઇ પરમાર (શિવ કોર્પોરેશન) ગામ:- અલંગ. • હયાત પ્રોજેક્ટમાં અપગેડેશન કરવાના છો કે નવી જમીન પર? • સુચિત આધુનિકીકરણની દરખાસ્ત નાં સ્થાને અલંગ માં કામ કરતાં કામબારોનાં સ્વાસ્થ્ય-સંબંધી હોસ્પિટલ નાં આધુનિકિકરણ પર વધુ ભાર મુકાવો જોઇએ.	• હયાત પ્લોટો માંથી પ્રથમ તબક્કામાં ૭૦ પ્લોટોનું અપગ્રેડેશન કરવામા આવશે. રેવન્યુંની જમીન નથી લેવાની, ગુજરાત મેરીટાઇમ બોર્ડની જમીન પર જ અપગ્રેડેશન થશે. • હાલનાં તબક્કે સારી સુવિધાવાળી ટર્શિયરી કેર સાથેની હોસ્પિટલની બાંધકામની કામગીરી શરૂ છે, જેમાં Burns Ward , Trauma Center etc જેવી સુવિધાઓ ઉપલબ્ધ કરાવવામાં આવશે. જે હયાત	

		સુધારણા કાર્યક્રમનાં ભાગરુપે કરવામાં આવશે.	
	• ૧૫૦ કરોડ્નું બજેટ ફાળવેલ છે તે ક્યાં ખર્ચાશે અને કેવી રીતે?	• ૧૫૦ કરોડના બજેટમાંથી લેબરો માટે પ્રાથમિક તબીબી સારવાર કેન્દ્ર તેમજ પ્રાથામિક સુવિધાઓ ઉભી કરવામા આવશે.	
	• પ્રેઝેન્ટેશનમા જણાવેલ છે કે, ડેવલોપીંગના કારણે હાલનો શિપ કટીંગ વેપાર ૩૨% છે તે વધીને ૭૦% જેટલો થશે જે હાલના બજારનાં નુકશાન પાકિસ્તાન જેવા દેશોનાં હિસ્સાનાં કારણે વ્યાજબી લાગતું નથી.	• આંતરરાષ્ટ્રીયા સમજુતી પ્રમણે પર્યાવરણીય ધોરણો સુધારવા માટેનું જે દબાણ દુનિયાનાં દેશો ઉપર છે તેનો ભારત જેવા દેશોને ફાયદો થશે કે , જે પોતાના પર્યાવરણીય ધોરણોમાં સુધારા કરી રહ્યું છે.	
	• શા માટે અહિંયા સારી હોસ્પિટલ બનાવવામાં નથી આવતી? લેબરને ભાવનગર સુધી હોસ્પિટલ જવાની જરૂર શા માટે પડે?	• હાલનાં તબક્કે સારી સુવિધાવાળી હોસ્પિટલની બાંધકામની કામગીરી શરૂ છે, જેમાં Burns Ward , ટ્રોમા સેન્ટર વગેરે જેવી સુવિધાઓ ઉપલબ્ધ કરાવવામાં આવશે.	
	• બીલ્જ વોટરનો શિપ બ્રેકીંગ કોડ મુજબ TSDF Site માં નિકાલ થાય છે તો, આ વસ્તુ પ્રેઝેંટેશન ડોક્યુમેંટમાં બતાવેલ નથી. તેની જગ્યાએ તેવું દર્શાવેલ છે કે અપગ્રેડેશન કર્યા પછી બિલ્જ વોટર TSDF Site પર મોકલવામાં આવશે. હાલમાં પણ બિલ્જ વોટર TSDF Site પર જ મોકલવામાં આવે છે. આ પ્રકારના પબ્લીક ડોક્યુમેન્ટમાં આવી ભુલ ન હોવી જોઇએ.	• હાલમાં બીલ્જ વોટરનો શિપ બ્રેકીંગ કોડ મુજબ નિકાલ કરવામાં આવે છે, EIA રીપોર્ટ અને પ્રેઝેંટેશનમાં બતાવવામાં આવેલ છે કે ભવિષ્યના ડેવલોપીંગ કર્યા પછી પણ આ પ્રકારનાં નિકાલ ચાલુ રાખવામાં આવશે.	

	• JICA Project દ્વારા જાપાન સરકાર નાણાંકીય સહાય કરવાનું છે તો , જાપાન દેશ શિપ અહીં (અલંગ – સોસિયા) રીસાયક્લિંગ કરાવવા માટે મોકલશે? • આ પ્રશ્ન પર્યાવરણને લગતો નથી પરંતુ, છેલ્લે ફરીને પર્યાવરણ પર આવશે. અત્યારે આર્થિક ભારણ નથી પણ ભવિષ્યમાં આર્થિક ભારણ આવશે.	• જાપાન સરકારે આવું કોઇ કમીટમેન્ટ કરેલા નથી. • આ પૈસા JICA તરથી આવશે અને તેનું આર્થિક ભારણ રીસાયકલર પર આવશે નહિં.	• અધ્યક્ષસ્થાને થી જણાવવામાં આવેલ કે, આ આર્થિક ભારણનો પ્રશ્ન હોય જેની ચર્ચા અલગથી કરવામાં આવશે.
4.	નામ:- રવુભા ગણપતસીંહ ગોહિલ, સરપંચ ગામ:- અલંગ. • અલંગ નોટીફાઇડ એરીયામાં ઘોઘા તાલુકાના આઠ ગામનો સમાવેશ કરવામાં આવેલ છે, જેથી અમારે જમીનને જુની શરતમાંથી નવી શરતમાં ફેરવવામાં તકલીફ પડે છે તો, અમારા ગામોને નોટીફાઇડ એરયામાથી કાઢી નાંખવા વિનંતી.		• અધ્યક્ષસ્થાને થી જણાવવામાં આવેલ કે, આ બાબત પર્યાવરણીય સુનાવણીને લગતી ન હોય તેને અલગથી જેતે સંસ્થા દ્વારા સાંભળવામાં આવશે.
5.	નામ:- રમેશ અગ્રવાલ ગામ:- અલંગ. • હયાત પ્લોટ માટે Inter Tidal Zone Management નુ શું પ્રોવીઝન છે અને તેના માટે શું પ્લાન બનાવેલ છે , જેના વિશે આંતરરાષ્ટ્રીય સેમિનારોમાં પુછવામાં આવે છે.	• Inter Tidal Zone Management ફેઇઝવાઇઝ કરવામાં આવશે , જેમાં ૭૦-પ્લોટોનું પ્રથમ તબક્કામાં અભેદ્ય તળીયુ બનાવવામાં આવશે અને ત્યારબાદ , બાકીના પ્લોટોનું આધુનિકરણ કરવામાં આવશે.	

6.	નામ:- રાજેન્દ્રસીંહ ગોહિલ ગામ:- સોસીયા. • આ આધુનિકીકરણ ના કારણે વધારાનાં ઉત્પન્ન થનાર જોખમી કચરાના નિકાલ માટે શું વ્યવસ્થા કરવામાં આવશે અને જોખમી કચરાનું ઉત્પાદન વધવાનાં સંજોગોમાં તેનો નિકાલ કઇ જગ્યાએ કરવામાં આવશે ?	• હેઝાર્ડસ્ટ વેસ્ટનો નિકાલ TSDF – GEPIL માં કરવામાં આવશે જેનું આયુષ્ય 30 વર્ષ સુધીનું છે.	
7.	નામ:- રોહિત અગ્રવાલ (પ્લોટ ધારક, પ્લોટ નં. 30) ગામ:- અલંગ. • સુચિત આધુનિકીકરણની દરખાસ્ત સમયે આંતરરાષ્ટીય કક્ષાએ ભવિષ્યમાં આવનાર નવા નિયમો / કરારો ને ધ્યાને રાખેલા છે કે કેમ ? • ડ્રાય ડોકનો મોડ્સ ઓફ ઓપરેન્ડી કેવી રહેશે? અને આ અંગેના ખર્ચા કોણ ભોગવશે.	• અત્યારનાં આંતરરાષ્ટીય કાયદાઓને ધ્યાનમાં લઇ આધિનિકિકરણ કરવામાં આવી રહેલ છે. પ્રથમ ૫ થી ૭ વર્ષમાં ૭૦ પ્લોટો ડેવલોપ કરવામાં આવશે, ત્યારબાદ બીજા તબક્કામાં બાકીના પ્લોટો અપગ્રેડ કરવામાં આવશે. • ડ્રાય ડોકમાં સ્પેશ્યલ પ્રકારના જહાંજો જ આવશે, જેનું આર્થિક ભારણ આવશે. ડ્રાય ડોકના કારણે ઝીરો હેઝાર્ડસ સ્પીલ રહેશે.	
8.	નામ:- કનુભાઇ હરીભાઇ રાવ, ગામ: ચણીયાળા. • નજીકનાં વિસ્તારમાં શીપ-રીસાયક્લિંગની પ્રવૃત્તિનાં કારણે ખેતીવાડીને નુકશાન થાય છે , જેના માટે સરકાર શું કરે છે?	• અગાઉ જણાવ્યાં મુજબ સેન્ટ્રલ સોલ્ટ મરીન કેમિકલ્સ રીસર્ચ ઇન્સ્ટીટ્યુટ તથા અન્ય જવાબદાર સંસ્થાઓ દ્વારા ઘણા અભ્યાસ જેવા કે ભુગર્ભ જળ	

		નમુનાઓની ચકાસણી કરવામાં આવે છે જેમાં ખેતીવાડીને નુકશાનકારક તત્વોનું પ્રમાણ જોવા મળેલ નથી.	

સ્થળ:- અલંગ.
તારીખ: ૨૦.૧૦.૨૦૧૫

આર.આર.વ્યાસ
પ્રાદેશિક અધિકારી,
ગુજરાત પ્રદૂષણ નિયંત્રણ બોર્ડ, ભાવનગર.

બંછાનીધી પાની (IAS)
જિલ્લા કલેકટર અને મેજીસ્ટ્રેટશ્રી
ભાવનગર

Annexure-B

A Statement showing issues raised by the participants and responded by the representative of the project during the Public Hearing.

As per the Ministry of Environment & Forest, Government of India, New Delhi vide its Notification no. S.O. 1533 dated Sept. 14, 2006 as amended; Public hearing is fixed for the proposed project of M/s Gujarat Maritime Board, covered under category 7(B) for upgradation of existing Recycling Yard at Alang Sosiya, Gujarat for undertaking safe and environmentally sound ship-recycling operations at Alang (CT), Tal: Talaja, Dist: Bhavnagar, Gujarat. The Public Hearing is being held on 20.10.2015 at 11.00 am at Training & Welfare Complex, Gujarat Maritime Board, Alang, Tal: Talaja, Dist: Bhavnagar, Gujarat.

Shri R. R. Vyas, Regional Officer, GPCB, Bhavnagar & member secretary of the public hearing committee, explained about the background of the environmental clearance required by the project proponent and opportunity being provided to the people residing in and around project site as per aforesaid notification.

Shri Banchhanidhi Pani, District Magistrate, Bhavnagar and Chairman of the public hearing committee, explained about the importance of the Public Hearing and asked the people to put forward their suggestion and objections if any, about the proposed project, freely.

Shri R.R.Vyas with the permission of the District Magistrate, asked the representative of M/s Gujarat Maritime Board to make a presentation covering summary report of draft EIA prepared by the project proponent.

The representative of M/s Gujarat Maritime Board made a presentation for their Proposed up-gradation of existing Recycling Yard and also for undertaking safe and environmentally sound ship-recycling operations at Alang, Tal: Talaja, Dist: Bhavnagar, Gujarat.

After completion of presentation by the company, the forum is declared opened for representation made by the local people.

The issues raised by the participants and responded by the representative of the applicant during the public hearing are as under;

Sr. No	Issue raised	Response made by M/s GUJARAT MARITIME BOARD.	Remark
1	Name: Makabhai Gabhubhai Varu. Village- Manar. • Rise in pollution levels in the ground water and affects the health due to ship recycling activity in the Alang Sosiya region. He also raised a concern about lack of basic health amenities in the nearby villages, and opposed the project.	• The ground water quality of the region is monitored by recognized institutes like CSMCRI, Bhavnagar, and others since last fifteen years. The results of the studies not indicating Hazardous effect in the ground water quality.	
2	Name: Bhavin Shah (Ship Recycler, Plot no. 68) Village: Alang. • Number of tankers for recycling at Alang-Sosiya is on a decline which is majorly due to lack of environmental regulations for recycling in Bangladesh & Pakistan. Any economical study is carried out for the burden of additional investment to be involved in the proposed modernization?	• Owing to setting up of a dry dock and proposed modernization, ship owners from the OECD countries would send their vessels as permitted by their own regulations to send the ships for recycling to Alang. At present these countries are constrained not to send ships to Alang. This modernization of facilities will add to the capacity of sustainable recycling of special vessels which will result into better business for the region and tankers are being regulated by PESO.	
	• It is proposed to Amend plots for ship recycling but under the present scenario only 30% - 40% of existing plots are having business and the share of Alang at world level is decreasing every year. If sufficient work/business is not available with the existing plots owners then what is need to develop additional plots.	• Currently, there is a global recession; however India is affected less in comparison to other countries in this business. The project will be completed in 7 to 8 years in a phased manner.	
	• The shipping companies are in dialogue with Government, but whether the ships will come to India?	• With the up-gradation the number of ships will increase	

	• It was suggested that in any project development plan for Alang-sosiya ship recycling, GMB should take SRIA in to confidence of recyclers association.		
3	Name: Haresh Parmar (Member, SRIA of India) Village: Alang		
	• Whether GMB is proposing further land acquisition as part of the proposed modernization project.	• In first phase the existing 70 plots will be upgraded and no reclamation of land or further acquisition of land is proposed. The upgradation will be carried out in the GMB land only.	
	• Why proposal of a hospital was not part of the proposed project, since health of workers in Alang-Sosiya is a more pressing concern than environment preservation.	• GMB is already constructing hospital with tertiary care facility (including burns ward, trauma centre, etc.) as part of existing ongoing programme.	
	• What are the different budget allocations for the proposed Rs. 150 Crores ?	• Primary health centre and other primary facilities will be developed for workers from the Rs. 150 Crores budget.	
	• The projection mentions that business of Alang Sosiya will rise from 32% of world market share to 70% is not feasible in light of the current loss of market and share of countries like Pakistan.	• Due to International agreement nations are under pressure to improve its environmental standards that will benefit countries like India, which is going to improve their environmental standards.	
	• Why a good hospital is not being in Alang and Labour need to go to Bhavnagar for this purpose.	• GMB is already constructing hospital with tertiary care facility (including burns ward, trauma centre, etc.) as part of existing ongoing programme.	
	• Currently the Bilge water is been sent to the TSDF site but it is not shown in the presentation, instead, it has been mentioned that it will now be sent to the TSDF site after proposed up-	• The current practice of disposal of Bilge water is done as per the ship breaking code however it is been also mentioned that same practice will be followed under the	

	gradation. The bilge water is actually sent to TSDF even at present also. Such mistake should not be there in the report which is made public. • Since JICA is one of the sponsors of the proposed project, is there any commitment given that the Japanese ships will be sent to Alang-Sosiya for recycling of Japanese ships. • Though the question is not directly related to the environment, it is finally concerned to the environment. There is no financial burden presently, but it will be transferred on the recyclers in future.	proposed up-gradation also in EIA . • No such specific commitment has been tendered by Government of Japan as of now. • Since JICA is the sponsoring the project, the economical burden will not be on the ship recyclers.	• It is pointed by the Chairman of the committee, that this forum is to discuss on the environmental aspects due to the proposed project
4	Name: Ravubha Ganpatsinh Gohil, (Sarpanch) village : Alang • Eight villages of Ghogha Taluka, which are included in notified area due to which we have trouble in transferring from old land conditions to new land conditions, so exclude our village from the notified area.		• The Chairman of the committee stated that the matter was pertaining to revenue and outside purview of the Environmental Public Hearing.
5	Name: Ramesh Agarwal, (Secretary – SRIA) Village: Alang. • What are provisions of Inter Tidal Zone Management for existing plots, and what plans are made which is asking in international seminars.	• Intertidal Zone Management is proposed to be taken up in a phased manner. About 70 plots will be taken up for impervious floor improvement during Phase I of development. Rest of the plots will be taken up for improvement in the second phase.	

6	Rajendrasinh Gohil, Village: Sosiya • What is the arrangement made for disposal of additional Haz.Waste that would be generated and what will be the location at which hazardous waste disposal will be carried out due to the increase in waste generation.	• The disposal of Hazardous Waste will be carried out in existing GEPIL – TSDF Site and its expected life is about 30 Years.	
7	Name: Rohit Agarwal, Village: Alang • Whether any benchmark is to be considered for the proposed recycling up-gradation with possible new international rules/treaties that might come up in future ? • What will be modus-operandi of economics in providing the dry docks? Who will bear cost for that?	• The up-gradation is based on the prevailing international conventions. In first phase of 5 to 7 years, 70 plots will be upgraded and remaining will be upgraded latter in second phase. • Only ships of special concerns will come in dry Dock and to that extent cost will have to be born. Dry dock shall have zero waste spill.	
8	Name: Kanubhai Haribhai Rao, Village: Chaniyala. • Agricultural crop in the area is adversely affected due to ship recycling activity in the area. What is Govt. doing for that ?	• As stated earlier, many studies including ground water quality, soil quality etc. of the region is monitored by CSMCRI, Bhavnagar and other recognized agencies since last fifteen years. The results of the studies do not indicate any damage in agriculture activity.	

Place: Alang
Date: 20.10.2015

R. R. Vyas
Regional Officer &
Representative of Member Secretary, GPCB

Banchhanidhi Pani
District Magistrate
Bhavnagar

COVERING NOTE

Save Environment : Care for next Generation

Environment public hearing of m/s Gujarat maritime board, Ta. Talaja Dist. Bhavanagar

Serially page 01 of 10

Version 01

Date 22 September 15

From :
Pravinbhai P. Sheth, A-8, Kalindi Appartment, Chikuwadi,Ankleshwar–393001. Gujarat.
Senior citizen : Technocrat & environmentalist
cell no. : 09377958840, contact mail id – gcfastservice2@gmail.com

To,
*Member secretary GPCB, Gandhinagar, Gujarat, ms-gpcb@gujarat.gov.in
publichearing@gmail.com

*Document submitted at Annex 11.1 is not a valid accreditation certificate as, as per referred document, validity period is mentioned as 2013, & is already over and if a valid certificate was available with proponent , then, why it was not incorporated in EIA report. and other non relevant documents are submitted to misguide public.
We wonder, how it was not checked at the time of accepting the EIA report.

cc,
Chair person, environment, public hearing,
& dist. magistrate, Bhavnagar Gujarat collector-bav@gujarat.gov.in

cc
Director, (ToR issuing authority) MoEF, New Delhi, hota@nic.in
File no. 11-43/2014- IA-III, ToR issued on 22.12.14
CEO –NABET-QCI New Delhi nabet@qcin.org

SUB : Written response to Environment public hearing of, m/s Gujarat maritime Board, Ta. Talaja, dist. Bhavanagar, Gujarat, (a Govt. of Gujarat project) schedule on 20 Oct. 15, project File no. File no. 11-43/2014- IA-III, ToR issued on 22.12.14 'EIA', report prepared by m/s Macon limited, Ranchi (Govt. of India enterprise)

Respected Hardik shah saheb,

We forward here with our written response, pl. obtain a written satisfactory reply from proponent directly addressed to you with a copy to us and incorporate the same in MoM.

We wonder, what quality of EIA report is prepared by accredited consultant MACON, a Govt. of India enterprise, as preliminary basic but vital information also are MIS-LEADING ONE TO PUBLIC. We wonder, how it has 'missed' to notice at your end.

sr no.	ToR General condition	comments
	xi	ToR xi compliance. NABET QCI Accredited certificate submitted in Annex 11.1, is NOT VALID ONE!!, In that case ,what is a value addition of submitting following documents, which are just misguiding one to public, a - Proponent's undertaking, which itself is controversial. b- NABET-QCI payment reminder letter dated Oct, 14, 2014 c- NABET-QCI payment reminder letter dated June 17,2013 in name of Terracon ecotech, pvt ltd, Annex 11.3, which is a SELF CERTIFIED , IS IT A NABET ACCREDITED CERTIFICATE, WHERE IS A WORD LIKE 'CERTIFICATE'? d- NABET-QCI scope of accreditation.

Save Environment : Care for next Generation

Environment public hearing of m/s Gujarat maritime board. Ta. Talaja Dist. Bhavanagar

		ALL above DOCUMENTS , referred as a, b, c, d, in no way justify , Annex 11.1 as ACCREDITED CERTIFICATE, Every thing is very much confusing and misleading. REFERRED ToR CAN NOT BE CONSIDERED AS A COMPLIANCE
	xiii	a- NABL accreditation certificate, validity is OK. b- It is not clear in sec. 3.1 to 3.4, that WHERE (at which location) various base line studies samples were analyzed? c- Even If we take it granted, that it is analysed at 'Kolkatta based NABL lab, then is it that all the samples were analysed at Kolkatta' where by unnecessarily loading heavy financial burden on Gujarat Govt, d- Pl. provide actual date of sampling and actual date of 'starting of analysis of all base line studies samples being analysed at Kolkatta based NABL lab? e- In case, if any of sample was analysed at any other approved lab, then pl. provide it's approval details and contact details and in particular. which samples were analyzed? f- Is there not any approved lab in Gujarat?
	Additional query	On each EIA page, at header side, name of proponent is not mentioned, but 'project activity' is mentioned, core question is, why name of project proponent is not mentioned? is there any reservation on disclosing 'proponents name- a- Gujarat govt. project.-AND IF NOT, Pl. INCORPORATE NAME OF PROPONENT AT HEADER SITE ON EACH 'EIA' PAGE NUMBERS AND CONFIRM.

As a ready reference to regulatory authorities, all the desired 'EIA' pages extracted from EIA report are reproduced with this covering note.

Pl. do contact us for any more information / clarification on our query.

We do welcome all the projects in Gujarat, which are supported with a good quality & transparent 'EIA' report.

Response VERSION 02 follows with 'as applicable other ToR non compliance and likely attracted technical queries'

Tip to proponent & to accredited consultant – both are Govt. dept.
It was preferred if report would have been reviewed at least once to avoid such query OR should have hired services of external EHS expert / reviewer.

Thanks and with kind regards,

pravinbhai p sheth

file- Gujarat marytime- bhavanagar-eph- 201015 - ver 01

pl. excuse for any type / type setting / vocabulary / spelling mistakes if any.

WE ALL NEED A HELPING HAND

plant more trees

save environment

care for next generation

Sl. No.	ToR	Chapters	Pages	Remarks
xi	The status of accreditation of the EIA consultant with NABET / QCI shall be specifically mentioned. The consultant shall certify that his accreditation is for the sector for which this EIA is prepared.	11	225-236	The EIA/EMP report has been prepared by MECON Limited, a Public Sector undertaking under the Ministry of Steel Government of India. MECON Limited is accredited by QCI/NABET for preparing EIA/EMP reports in 16 major sectors, including *"All Ship-breaking Yards including Ship-breaking Units"* vide their certificate no. NABET / EIA / 1013 / 031. This certificate is valid up to 7th February, 2017. Copy of certificate enclosed in Chapter 11 (as Annexure 11.1) of Report.
xii	The front page of EIA / EMP Reports, the name of the consultant / consultancy firm along with their complete details induding their accreditation, if any, shall be indicated. The consultant while submitting the EIA / EMP Report shall give an undertaking to the effect that the prescribed TORs (TOR proposed by the project proponent and additional TOR given by the MoEF) have been complied with and the data submitted is factually correct (Refer MoEF office memorandum dated 4th August, 2009).		Page- B, C	Noted and complied. Front page of EIA Report gives necessary details of M/s MECON Ltd. the EIA Consultant firm . Signed undertaking by EIA Co-ordinator and involved Functional Area Experts of MECON on company letter-head enclosed in EIA Report.
xiii	While submitting the EIA / EMP Reports, the name of the experts associated with / involved in the preparation of these		Page-B, C,	Signed undertaking by EIA Co-ordinator and involved Functional Area Experts of MECON on company letter-head enclosed

Sl. No.	ToR	Chapters	Pages	Remarks
	reports and the laboratories through which the samples have been got analysed should be stated in the report. It shall clearly be indicated whether these laboratories are approved under the Environment (Protection) Act, 1986 and the rules made there under (please refer MoEF Office Memorandum dated 4th August, 2009). The project leader of the EIA Study shall also be mentioned.	11	236	in EIA Report. Copy of Gazette notification according MoEF recognition to laboratory involved in sampling & analysis also included (in Chapter 11 of Report).
xiv	All the ToR points as presented before the Expert Appraisal Committee (EAC) shall be covered	Under ToR Compliance	i-vi	Noted and complied

GUJARAT MARITIME BOARD

Ref. No: GMB/Env/91(C)/EC-JICA/4686

UNDERTAKING

I, hereby undertake that the prescribed Terms of Reference with respect to EIA / EMP Studies for Proposed Upgradation of Existing Alang-Sosiya Ship Recycling Yard for undertaking safe and environmentally sound ship recycling operations located in Talaja Tehsil of Bhavnagar District, Gujarat has been complied with while conducting the EIA Studies. The content (information & data) as given by our consultant in the EIA Report are factually correct with full knowledge of the undersigned.

Date: 04/08/2015

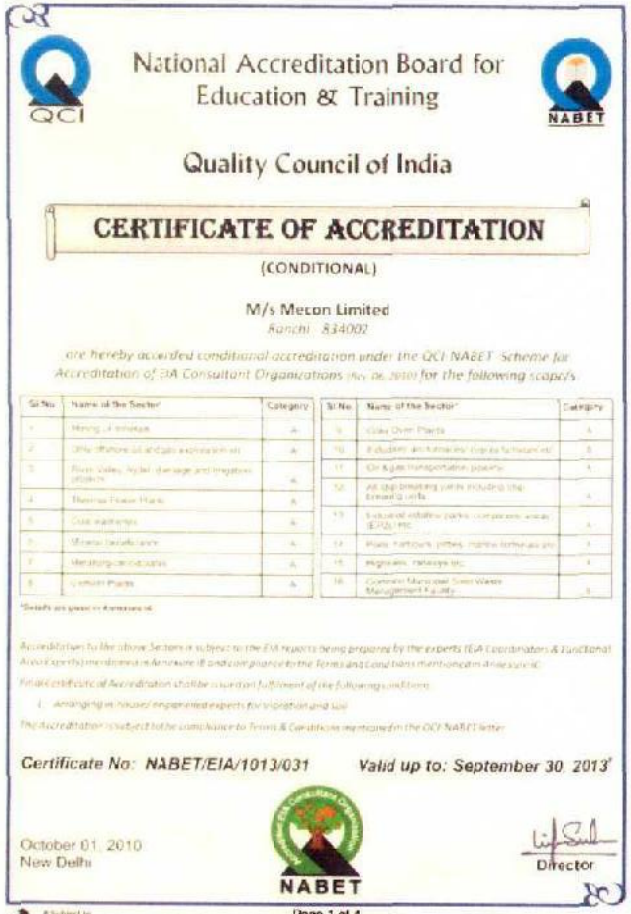
Place: Gandhinagar

Dy. General Manager (Env.)
Environment Cell
Gujarat Maritime Board,
Gandhinagar, Gujarat

HOW ONE CAN ACCEPT THIS, WHEN, EVEN VALID ACCREDITED CERTIFICATE NOT PROVIDED

Head Office : Sector 10-A, "Chh" Road, Opp. Air Force Staton, Gandhinagar - 382010. Gujarat (INDIA)
Phone : (91-079) 23238346/47/48/51, Fax : (91-079) 23234704, Tele-Fax : 079-23234705.
E-mail : info@gmbports.in **Website : www.gmbports.org**

Annexure 11.1: NABET Accreditation Certificate of MECON Ltd.



National Accreditation Board for Education & Training

Quality Council of India

CERTIFICATE OF ACCREDITATION

(CONDITIONAL)

M/s Mecon Limited
Ranchi 834002

are hereby accorded conditional accreditation under the QCI NABET Scheme for Accreditation of EIA Consultant Organizations (Rev. 06, 2010) for the following scope/s

Sl No.	Name of the Sector	Category	Sl No.	Name of the Sector	Category
1	Mining of minerals	A	9	Coke Oven Plants	A
2	Offshore oil and gas exploration etc	A	10	Foundries and manufacturing castings/forgings etc	B
3	River Valley, Hydel, drainage and irrigation projects	A	11	Oil & gas transportation pipelines	A
4	Thermal Power Plants	A	12	All types of refining units including the linked units	A
5	Coal washeries	A	13	Industrial estates/ parks/ complexes/ areas/ EPZs/ SEZs	A
6	Mineral beneficiation	A	14	Ports, harbours, jetties, marine terminals etc	A
7	Metallurgical industries	A	15	Highways, railways etc	A
8	Cement Plants	A	16	Common Municipal Solid Waste Management Facility	B

*Details are given in Annexure-II

Accreditation to the above Sectors is subject to the EIA reports being prepared by the experts (EIA Coordinators & Functional Area Experts) mentioned in Annexure-III and compliance to the Terms and Conditions mentioned in Annexure-II.

Final certificate of Accreditation shall be issued on fulfilment of the following conditions:

i. Arranging in-house/ empanelled experts for violation and soil

The Accreditation is subject to the compliance to Terms & Conditions mentioned in the QCI NABET letter.

Certificate No: NABET/EIA/1013/031 **Valid up to: September 30, 2013***

October 01, 2010
New Delhi

NABET

Director

*Subject to

Page 1 of 4

VALIDITY OVER IN 2013

National Accreditation Board
for Education and Training

NABET/EIA/RA022/047 Oct 14, 2014

The Deputy General Manager
Environmental Engineering Section
Mecon Limited
Doranda, Ranchi – 834002
(Kind Attention: **Mr. Manas K Mukhopadhyay**)

Dear Sir,

Sub: Re-Accreditation

This has reference to your application to QCI-NABET for re-accreditation (RA) as EIA Consultant Organization and the assessment carried for same in your organization from Feb. 05- 08, 2014.

We are pleased to inform you that based on the document and office assessments during RA, the Accreditation Committee has approved renewal of accreditation given to your organization for a period of three years from Feb. 08, 2014 to Feb. 07, 2017 subject to coverage of balance Functional areas and specific response to NCs/Obs./Alerts issued, if applicable (Refer Annexure III) with the following details:

1. Annexure I - Scope of accreditation
2. Annexure II - List of experts with approved sectors/ functional areas
3. Annexure III - Non-Conformances/ Observations/ Alerts (NCs/ Obs./ Alerts)
4. Annexure IV - Observations on Quality Management System (QMS)
5. Annexure V - Terms and conditions of accreditation
6. Annexure VI - Result of assessment
7. Annexure VII - Guidelines for addressing Major Non-Conformances/ Observations/ Alerts
8. Annexure VIII - Format to be followed for mentioning the names of the experts involved in EIA reports prepared by **Mecon Limited**.

Result of RA including Non-Conformances/ Observations/ Alerts (NCs/ Obs./ Alerts) applicable to your organization as per RA are also posted on QCI website vide minutes of the Accreditation Committee meetings dated Mar. 07 2014, Mar. 28, 2014 and Apr. 25, 2014. You are requested to take necessary actions to close the NCs/Obs. as per guidelines and timeframe mentioned in Annexure VII of this letter.

You are required to make all payments to NABET as applicable, within one month from the date of invoice sent to you. Continuation of this accreditation of your organization is subject to the clearance of all dues by your organization, satisfactory compliance to Annexure II and V.

With best regards,

Yours sincerely,

(Vipin Sahni)
C.E.O.

6th Floor, ITPI Building, 4-A, Ring Road, I.P Estate, New Delhi - 110 002, India
Tel: +91-11-2332 3416 / 17 / 18 / 19 / 20 Fax: +91-11-2332 3415
e-mail: nabet@qcin.org Website: www.qcin.org

THERE IS A WORD LIKE NABET,QCI, ACCREDITATION BUT NOT THE CERTIFICATE!!!
LETTER IS OF OCT 14, STILL PAYMENT NOT MADE OR WHAT AS ON DATE OF SUBMISSION OF THIS EIA REPORT?

IT IS A PAYMENT REMINDER & NOT THE ACCREDITED CERTIFICATE,
CAN NABET CERTIFY THIS AS ACCREDITED CERTIFICATE

WHAT IS VALUE ADDITION OF THIS DOCUMENT?

Annexure 11.2: NABL Accreditation Certificate of M/S Mitra S.K. Pvt. Ltd.

NABL

National Accreditation Board for Testing and Calibration Laboratories

Department of Science & Technology, India

CERTIFICATE OF ACCREDITATION

MITRA S. K. PRIVATE LIMITED

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2005

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

Udayan Industrial Estate, Building No. P-48, 3, Pagladanga Road, Kolkata, West Bengal

in the discipline of

CHEMICAL TESTING

(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Certificate Number T2303

Issue Date 10/09/2014 [redacted] **Valid Until** 17/09/2016

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the additional requirements of NABL.

Signed for and on behalf of NABL

N.Venkateswaran
Program Manager

Anil Relia
Director

Prof. K. VijayRaghavan
Chairman

VALIDITY OK. BUT WHY GUJARAT SAMPLES WERE ALL THE WAY ANALYSED AT KOLKATTA AT A VERY HUGE COST.
IS THERE NO NABL LAB IN GUJARAT?

Annexure 11.3: NABET Accreditation Certificate of M/s Terracon Ecotech Pvt. Ltd.

National Accreditation Board
for Education and Training

June 17, 2013

The Director
Terracon Ecotech Private Limited
6th Floor, 'Swagat', Shraddhanand Road,
Vile Parle (East), Mumbai – 400057
(Kind Attention: **Dr. Ramesh Madav**)

Dear Sir,

QCI - NABET Scheme for Accreditation of EIA Consultant Organization

This is with reference to your application to QCI – NABET for Accreditation as EIA Consultant Organization.

We are pleased to inform you that based on Document & Office Assessments, the Accreditation Committee has recommended provisional accreditation of your organization as per the scope given in **Annexure I and II.** Also find attached herewith the following:

a. Detailed terms & conditions of accreditation **(Annexure III).**
b. Results of various aspects of assessment of your organization **(Annexure IV).**
c. The format which is to be followed for mentioning the names of the experts involved in the EIA reports prepared by you **(Annexure V).**

Please confirm the correctness of spellings of the names of the experts mentioned in Annexure II. Please check the QCI website for the Minutes of the Accreditation Committee Meetings held on February 18 and May 28, 2013 for observations related to your application for compliance. You are also advised to visit QCI website to check clarifications on the Scheme issued from time to time for necessary actions at your end.

The accreditation of your organization will be for a period of three years starting January 19, 2013. The annual renewal of the accreditation will be confirmed after surveillance assessment. Surveillance assessments will be conducted to ensure compliance with NABET Scheme including the details mentioned in your Quality Manual and the terms & conditions mentioned in Annexure III.

May we request you for an early payment of the annual fees and your confirmation of acceptance of the terms and conditions attached. This will enable us to issue you the requisite accreditation certificate.

We thank you for your esteemed support in making this scheme successful and for your participation in this national cause.

Thanks and best regard,

Yours sincerely,

(Vipin Sahni)
C.E.O.

Institution of Engineers Building, 2nd Floor, Bahadur Shah Zafar Marg, New Delhi - 110 002, India
Tel. : +91-11-2337 9321, 2337 8057 Fax : +91-11-2337 8678 e-mail : nabet@qcin.org Website : www.qcin.org

NAME IS DIFFRENT
WHAT IS A VALUE ADDITION
OF THIS NABET LETTER?
IS IT A SELF CERTIFIED
ACCREDITAED CERTIFICATE?
IS IT PERMITTED BY NABET?

WHAT IS A VALUE ADDITION
OF THIS DOCUMENT

IT IS A PAYMENT REMINDER
& NOT THE CERTIFICATE

Scheme for Accreditation of EIA Consultant Organizations

Scope of Accreditation — **Annexure I**

NAME OF THE CONSULTANT ORGANIZATION: **Mecon Limited**
Environmental Engineering Section
Doranda, Ranchi – 834002

Sl. No.	Sector number: As per MoEF Notification	Sector number: As per NABET Scheme	Name of Sector	Category A/B
1.	1 (a) (i)	1	Mining of minerals including Opencast / Underground mining	A
2.	1 (b)	2	Offshore and onshore oil and gas exploration, development & production	A
3.	1 (c)	3	River Valley, Hydel, Drainage and Irrigation projects	A
4.	1 (d)	4	Thermal Power Plants	A
5.	1 (a)	5	Coal washeries	A
6.	2 (b)	7	Mineral beneficiation including pelletisation	A
7.	3 (a)	8	Metallurgical industries (ferrous &non-ferrous) – both primary and secondary	A
8.	3 (b)	9	Cement plants	A
9.	4 (b)	11	Coke oven plants	A
10.	6 (a)	27	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/coral reefs /ecologically sensitive areas including LNG terminal	A
11.	6 (b)	28	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)	B
12.	7 (b)	30	All ship breaking yards including ship breaking units	A
13.	7 (c)	31	Industrial estates/ parks/ complexes/areas, export processing Zones(EPZs), Special Economic Zones(SEZs), Biotech Parks, Leather Complexes	A
14.	7 (e)	33	Ports, harbours, jetties, marine terminals, break waters and dredging	A
15.	7 (f)	34	Highways, railways, transport terminals, mass rapid transport systems	A
16.	8 (b)	39	Townships and Area development projects	B
			Total = 16 Sectors	

Individual EIA Coordinators approved for different sectors are mentioned in Annexure II

(Vipin Sahni)
C.E.O.

Mecon Ltd., Ranchi — Page2 of 19

Page 4 of 4

IT IS A SCOPE OF ACCREDITATION, & NOT THE ACCREDITED CERTIFICATE, CAN NABET CERTIFY THIS AS A ACCREDITED CERTIFICATE.

Annexure A
Specimen copy to cite an example
From EIA Report during Jan/Feb. 15

National Accreditation Board
for Education and Training

NABET

NABET/EIA/927/IA14
The Director

May 12, 2014

Dear Sir,

QCI – NABET Scheme for Accreditation of EIA Consultant Organization

This is with reference to your application to QCI – NABET for Accreditation as EIA Consultant Organization.

We are pleased to inform you that based on Document & Office Assessments, the Accreditation Committee has recommended provisional accreditation of your organization as per the scope given in Annexure II and III. Also find attached herewith the following:

a. Results of various aspects of assessment of your organization (Annexure I).
b. Non-Conformances/Observations/Alerts issued after Initial Assessment (Annexure IV).
c. Detailed Terms & Conditions of accreditation (Annexure V).
d. Guidelines for addressing Non-Conformances/ Observations/ Alerts (Annexure VI).
e. Format to be followed for mentioning the names of the experts involved in EIA reports prepared by (Annexure VII).

Please confirm the correctness of spellings of the names of the experts mentioned in Annexure III. Please also check the QCI website for the Minutes of the Accreditation Committee Meeting January 22 and February 13, 2014 for observations related to your application, for compliance. You are advised to visit QCI website to check clarifications on the Scheme issued from time to time for necessary actions at your end.

The accreditation of your organization will be for a period of three years starting December 31, 2013, the date of office assessment. The continuation of the accreditation will be confirmed based on surveillance assessment to be carried out after 18 months from the date of initial accreditation. Surveillance assessment will be conducted to ensure compliance with NABET Scheme including the details mentioned in your Quality Manual and the terms & conditions mentioned in Annexure V.

May we request you for your confirmation of acceptance of the terms and conditions attached. Compliance to above will enable us to issue you the requisite accreditation certificate.

We thank you for your esteemed support in making this Scheme successful and for your participation in this national cause.

Thanks and best regards,

Yours sincerely,

(Vipin Sahni)
C.E.O.

Can this be accepted as Accreditation certificate?

Institution of Engineers Building, 2nd Floor, Bahadur Shah Zafar Marg, New Delhi - 110 002, India
Tel. : +91-11-2337 9321, 2337 8057 Fax : +91-11-2332 3415 e-mail : nabet@qcin.org Website : www.qcin.org

Annexure B
Specimen copy to cite an example.
From EI Reports during Jan/Feb. 15.

ANANNEXURE-

QCI Accreditation Certificate

National Accreditation Board
for Education and Training

[illegible]

Dear Sir,

QCI – NABET Scheme for Accreditation of EIA Consultant Organization

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Thanks and best regards,

Yours sincerely,

[illegible]
Director

Is it ax legal
accreditation certificate

Annexure C
Specimen copy to cite an example
From Jan/Feb-15

S. No.	Consultant Organization	Scope of Accreditation: As per NABET Scheme: Sector Number	Name of Sector	Category	Project or Activity as per Schedule of MoEF Notification dated September 14, 2006 and subsequent amendments
	Ltd.* e Services With Remark as * Provisional Conditions apply	34	Highways, Railways, transport terminals, mass rapid transport systems	A	7 (f)
	No Remark as * or Accredited. Conditions apply	1	Mining of minerals including Open cast/ underground mining	A	1 (a) (i)
		4	Thermal power plants	A	1 (d)
		8	Metallurgical industries(ferrous & non ferrous) - both primary & secondary	A	3 (a)
		31	Industrial estates/ parks/ complexes/Areas, export processing Zones(EPZs), Special economic zones(SEZs), Biotech Parks, Leather Complexes	A	7 (c)
		33	Ports, harbours, jetties, marine	A	7 (e)

*denotes Provisionally Accredited Consultants

can this be accepted as legal document in place of " Accreditation certificate.?
[Remark on last page as " error can not be ruled out.

THE HINDU

Chennai, May 9, 2015

Only accredited agencies can do EIA: Javadekar

PTI

The Hindu
Union Environment and Forests Minister Prakash Javadekar.

Only accredited agencies will be allowed to do Environment Impact Assessment (EIA) and there will be more such agencies which can do the

લડત

અઠવાડિક સમાચારપત્ર

તંત્રી : ધર્મેશ મિસ્ત્રી

લીગલ એડવાઈઝર : અશ્વિન મિસ્ત્રી

RNI REGD NO.: GUJGUJ/2012/43297

લડત કાર્યાલય : બ્લોક નં.૧૪, મકાન નં.૧૩૪૦, નર્મદા એપાર્ટમેન્ટ, મામલતદાર કચેરી સામે, ભરૂચ.

E-mail : ladat_athvadik2006@yahoo.com, Mo : 9998609115

VOLUME : 4 | ISSUE : 16 | DATE : 11-08-2015 Tuesday | PAGES : 4 | PRICE RS. 2/-

વર્ષ : ૪ | અંક : ૧૬ | તા.૧૧/૦૮/૨૦૧૫, મંગળવાર | પાના : ૪ | કિંમત રૂ. ૨/-

જી.પી.સી.બી. દ્વારા NABET - QCI ના ACCREDITATION સર્ટીફીકેટ વિના યોજાતી પર્યાવરણીય લોકસુનાવણી કેટલી યોગ્ય?

જીલ્લા મેજીસ્ટ્રેટ પર્યાવરણીય લોકસુનાવણીની તારીખ આપતા પહેલા જી.પી.સી.બી. પાસે લેખિત બાંહેધરી મુકાવે કે ઈ.આઈ.એ. રીપોર્ટમાં જરૂરી માંગેલ કાયદાકીય સર્ટીફીકેટ છે કે નહીં? અને ના હોય તો બીજા કોઈ ડોક્યુમેન્ટ કઈ ઓથોરીટીના લેખિત આદેશ થી જી.પી.સી.બી.એ સ્વીકારેલ છે.

[illegible]

પાયાના પ્રશ્નો તો એ છે કે પર્યાવરણ મંત્રાલય તરફથી રજુ કરવામાં આવેલ TOR સ્પષ્ટ રીતે જણાવે છે કે ઈ.આઈ.એ. પર્યાવરણ કન્સલ્ટન્ટને ફરજીયાત કાયદાકીય રીતે NABET - QCI નું ACCREDITATION સર્ટીફીકેટ મુકવાનું હોય છે અને એની અવેજમાં લેખિતમાં અન્ય બીજો કોઈ વિકલ્પ આપ્યા નથી. છતાં પણ જાણકારોનો એવો અનુભવ છે કે યુપીએ સરકારની વિદાય બાદ સત્તાપર આવેલ બીજેપી સરકારના એક વર્ષના શાસનકાળ દરમ્યાન જી.પી.સી.બી. તરફથી લગભગ અંદાજીત ૧૨૫ જેટલા ઈ.આઈ.એ. રીપોર્ટ વાંચી વંચાવીને બધી રીતે ચકાસીને રીપોર્ટની ક્વોલીટીની ખરાઈ કર્યા બાદ આશરે ૪૫ દિવસ બાદ આવા રીપોર્ટને જી.પી.સી.બી.ની વેબસાઈટ પર વિશ્વભરના લોકોની જાણ ખાતર મુકીને વાંધા સુચનો આગામી પર્યાવરણીય લોકસુનાવણી માટે મંગાવવામાં આવે છે. પરંતુ આશ્ચર્યની બાબત તો એ છે કે આવા રીપોર્ટની અંદર માંડ માંડ બહુ જુજ અને નહીવત આશરે ૫ ટકા જેટલા રીપોર્ટમાં કાયદાકીય માંગેલ NABET - QCI નું ACCREDITATION સર્ટીફીકેટ જોવા મળેલ છે. અને બાકીના ઈ.આઈ.એ. રીપોર્ટમાં સર્ટીફીકેટ સિવાયના વિવિધ ડોક્યુમેન્ટને મુકવામાં આવે છે. અને આવા બીજા ડોક્યુમેન્ટો સ્વીકારવાની સત્તા જી.પી.સી.બી.ને કઈ ઓથોરીટીએ આપી છે તેનું સ્પષ્ટીકરણ કરવામાં આવતુ નથી.

કદમ એન્વાયરોમેન્ટલ કન્સલ્ટન્ટ દ્વારા રજૂ કરવામાં આવેલ સર્ટીફીકેટ ઉપરોક્ત તસ્વીર નં.૧ માં દર્શાવેલ મુજબ છે. અને આ સર્ટીફીકેટમાં વેલીડીટી પણ જોઈ શકાય છે. આ સર્ટીફીકેટ NABET - QCI નું ACCREDITATION છે તે સ્પષ્ટ પણે જણાઈ આવી શકે છે. પરંતુ અન્ય કન્સલ્ટન્ટ દ્વારા બીજા ડોક્યુમેન્ટ એટલે કે ભળતા જ ડોક્યુમેન્ટ ઈ.આઈ.એ. રીપોર્ટમાં રજૂ કરવામાં આવે છે. જે તસ્વીર નં.૨ માં જોઈ શકાય છે. [illegible]

ભરૂચની મામલતદાર કચેરીમાં ભ્રષ્ટાચારનો જનક કોણ? કયા કારણોસર પ્રજાના કામો થતા ન હોવાની બુમ ઉઠે છે

[illegible]

આમોદ તાલુકાના તણછા ગામના ઓ.એન.જી.સી. લેન્ડલુઝર્સને વેલની સાફસફાઈના કામો આપવા કિસાન સંઘની રજૂઆત

[illegible]

જીપીસીબી એક નજર ઈધર ભી

ઈઆઈએ રીપોર્ટ જો ખરા અર્થમાં ખરાઈ કરાતો હોય તો પ્રદૂષણની સમસ્યાને મહદ્અંશે નિવારી શકાશે

અંકલેશ્વર (પી.પી. શેઠ દ્વારા): મુખ્યમંત્રી નરેન્દ્ર મોદીની કાર્યદક્ષ અને પારદર્શીય નેતાગીરી હેઠળ ઔદ્યોગિક ક્ષેત્રે ગુજરાત હરણફાળ ભરી રહ્યું છે અને ગુજરાતની પ્રગતિ ફકત ભારતમાં જ નહિં પરંતુ વિશ્વના નકશા પર ઉતરી આવી છે. અને પર્યાવરણીય પરવાનગી (E.C.) મેળવવા માટે સેંકડો ઉદ્યોગો (Project Proponents) એમના પર્યાવરણીય કન્સલ્ટન્ટ તરફથી (E.I.A. Report) સુપરત કરી રહયા છે પરંતુ આ રીપોર્ટો જયારે જીપીસીબીની વેબસાઈટ ઉપર પર્યાવરણીય લોક સુનાવણીના ભાગરૂપે પ્રજાના અભ્યાસ માટે મૂકવામાં આવે છે તેમજ તેમના તરફથી જરૂરી વાંધાસૂચનો મંગાવવામાં આવે છે ત્યારે મહદ્અંશે ઘણાં બધા રીપોર્ટો ક્ષતિયુકત જણાયા છે તો આ સંદર્ભે નવા નિમાયેલ ઈન્ચાર્જ સભ્ય સચિવ આર.જી. શાહ જો આ રીપોર્ટોનો વિધિસરનો ટેકિનકલ અભ્યાસ આવા રીપોર્ટોને વેબસાઈટ પર મૂકતા પહેલાં તેની ખરાઈ કરાવે અને પછીજ પ્રજાના અભ્યાસ માટે સુપરત કરે તો રીપોર્ટો વધારે પારદર્શક અને સાચા અર્થમાં પર્યાવરણની જાળવણી માટે યોગ્ય લેખાશે અને ગુજરાત રાજય ભારતની અંદર કદાચ પહેલા રાજય તરીકે લેખાશે અને આના થકી ભવિષ્યમાં ઉદભવતી ઔદ્યોગિક પ્રદૂષણની સમસ્યાઓને મહદ્અંશે નિવારી શકાશે તેમજ પૂર આવતા પહેલાં પાળ બાંધવા જેવું કાર્ય ગણાશે. જરૂરત પડે તો જીપીસીબી સુપરત કરાતાં દરેક E.I.A. Report ના ટેકિનકલ અભ્યાસ અને વાંધાસૂચનો સંદર્ભે ગુજરાતમાં જ સ્થાપિત થયેલ રીટાયર્ડ, અનુભવી ટેકનોક્રેટોની સેવા લઈ શકે છે. વન અને પર્યાવરણ મંત્રાલય પણ આ બાબત પર ગંભીર વિચાર કરી મુખ્યમંત્રીશ્રીને આ કાર્યને વેગવંતો બનાવવા માટે પૂરતો સહકાર આપે તો જ સ્વર્ણિમ ગુજરાતની ઉજવણી પહેલાં "નિર્મળ ગુજરાત"નું સ્વપ્ન ખરા અર્થમાં સાકાર થશે.

... નિર્મળ ગુજરાતનું સ્વપ્નું સાકાર થઈ શકે છે

અનુભવોનો નિચોડ ધરાવતા

જીપીસીબીના ઈન્ચાર્જ સભ્યસચિવ આર.જી. શાહની નિમણૂંકને આવકાર આપતા પર્યાવરણપ્રેમીઓ

ગાંધીનગર : ગુજરાત પ્રદૂષણ નિયંત્રણ બોર્ડના વર્ષોજૂના અનુભવી તેમજ પર્યાવરણ પ્રેમીઓના માનીતા એવા નવા નિમાયેલ ઈન્ચાર્જ સભ્યસચિવ આર.જી. શાહની નિમણૂંકને પર્યાવરણ પ્રેમીઓ, એનજીઓ તથા ગુજરાતમાં સ્થાપિત થયેલ ટેકનોક્રેટો આવકારે છે અને આ પદ માટેની નિમણૂંક યથાયોગ્ય પણ ગણાવે છે.

હાલમાં જ ગુજરાત પ્રદૂષણ નિયંત્રણ બોર્ડમાં ધરખમ બદલીઓ થઈ હતી. ત્યારબાદ, ગત સપ્તાહમાં જ સભ્યસચિવ સંજીવ ત્યાગીની પણ બદલી કરવામાં આવી હતી. તેમની જગ્યા પર ઈન્ચાર્જ સભ્ય સચિવ તરીકે રાજેન્દ્ર જી. શાહની નિમણૂંક કરાઈ છે. વર્ષોજૂના અનુભવી અને ટેકિનકલી સાઉન્ડ આવા વ્યકિતની કારકિર્દી પણ અનુભવોથી ભરેલી છે. ઈન્ચાર્જ સભ્યસચિવ આર.જી. શાહ છેલ્લાં ૨૮ વર્ષથી ગુજરાત પ્રદૂષણ નિયંત્રણ બોર્ડમાં નિષ્ઠાપૂર્વક ફરજ બજાવી રહયા છે. તેઓએ નડિયાદની ડીડીઆઈટી કોલેજમાંથી બી.ઈ. (કેમીકલ)ની ડિગ્રી મેળવેલ છે. તેઓએ મહારાષ્ટ્ર પ્રદૂષણ નિયંત્રણ બોર્ડમાં પણ ફરજ નિભાવેલ છે. તેઓએ ૯ વર્ષ સુરત ખાતે ગુજરાત પ્રદૂષણ નિયંત્રણ બોર્ડના પ્રાદેશિક અધિકારી તરીકે, ૪ વર્ષ રાજકોટ ખાતે ગુજરાત પ્રદૂષણ નિયંત્રણ બોર્ડના પ્રાદેશિક અધિકારી તરીકે ત્યારબાદ ગાંધીનગર ખાતે વડોદરા, અમદાવાદ, ભરૂચ પણ યુનિટ હેડની ફરજ નિષ્ઠાપૂર્વક બજાવેલ. વધુમાં પર્યાવરણની જાળવણી ક્ષેત્રે સૌથી અગત્યના હેઝાર્ડસ વેસ્ટ ખાતાના પણ તેઓ ઈન્ચાર્જ રહી ચૂકયા છે. આવા ચેલેન્જીંગ કાર્ય માટે આર.જી. શાહ જેવાજ ટેકિનકલ વ્યકિતઓની કાયમી ધોરણે સભ્યસચિવ તરીકે સરકાર દ્વારા નિમણૂંક થાય અને તેઓના અનુભવોના નિચોડનો લાભ લેવાય તેવું પર્યાવરણવાદીઓ ઈચ્છી રહયા છે અને આના થકી ગુજરાતમાં સ્થાપિત થયેલ અને આવનાર ઉદ્યોગો માટે પર્યાવરણ જાળવણી ક્ષેત્રે એક નવી દિશા ઉભી થશે અને વાઈબ્રન્ટ ગુજરાત થકી પરપ્રાંતમાંથી ગુજરાતમાં આવનારા ઉદ્યોગપતિઓને પણ આનો લાભ મળશે.

પ્રજાસત્તાક દિનના પાવન પર્વ નિમિતે
વન-પર્યાવરણ મંત્રી શ્રી મંગુભાઈ પટેલનો શુભેચ્છા સંદેશ

મંગુભાઈ પટેલ

મંત્રી,
આદિજાતિ વિકાસ, વન અને પર્યાવરણ,
ગુજરાત સરકાર,
તારીખ : 21 JAN 2009

શુભેચ્છા સંદેશ

વિશ્વ આખું જ્યારે ' ગ્લોબલ વોર્મિંગ ' ની વૈશ્વિક સમસ્યાનો સામનો કરી રહ્યું છે ત્યારે પર્યાવરણના ઘટકોનું મહત્વ સમજી વિષય પ્રત્યે આપણે સૌએ સંવેદનશીલ બનવું જ રહ્યું. સાથોસાથ એક વાત સમજી લેવાની જરૂર છે કે પર્યાવરણનું સંતુલન એ જ એક સમસ્યાનો ઈલાજ છે. પર્યાવરણનું જતન કરવા માટેનો સહુથી સરળ અને શ્રેષ્ઠતમ ઉપાય છે [illegible] વનો કે વૃક્ષોની રક્ષા કરવી અને વૃક્ષારોપણ દ્વારા નવા વૃક્ષો ઉછેરી નવા વનો ઊભા કરવા. વૃક્ષો પ્રત્યે મમતાનો ભાવ કેળવી તેના ઉછેર અને જતન માટે પ્રયત્નશીલ રહેવું પડશે. મને વિશ્વાસ છે કે વૃક્ષારોપણ અને વૃક્ષ જતનની આ ઝુંબેશમાં ગુજરાત પાક્ષિક ' પર્યાવરણ મિત્ર ' પણ એક આગવી [illegible] ' નિર્મળ ગુજરાત ' અને ' સ્વર્ણિમ ગુજરાત 'ના આપણા સૌના સ્વપ્નને સાકાર કરવામાં યોગદાન આપતું રહેશે.

આ અવસર પર તંત્રીશ્રી તેમજ પાક્ષિક સાથે સંકળાયેલ સ્ટાફને તેમજ સર્વે વાચક મિત્રોને ખૂબ ખૂબ શુભેચ્છાઓ પાઠવું છું અને વૃક્ષારોપણ અને વૃક્ષ જતનને એક નૈતિક ફરજ તરીકે ઉપાડવા અનુરોધ કરું છું.

(મંગુભાઈ પટેલ)

પ્રજાસત્તાક દિનના પાવન પર્વ નિમિતે
રાજયકક્ષાના વન-પર્યાવરણ મંત્રી
શ્રી કિરીટસિંહ રાણાનો શુભેચ્છા સંદેશ

કિરીટસિંહ રાણા

રાજ્યકક્ષા મંત્રી,
વન અને પર્યાવરણ
તારીખ : 13 JAN 2009

: શુભેચ્છા સંદેશ :

" પર્યાવરણ મિત્ર " ગુજરાતી પાક્ષિક અખબાર ૨૬ મી જાન્યુઆરીના રોજ એક વિશેષ પૂર્તિ પ્રકાશિત કરી રહ્યું છે, તે જાણી આનંદ થયો. પર્યાવરણની જાળવણી એ આજની જરૂરીયાત છે. " પર્યાવરણ મિત્ર " પાક્ષિકના માધ્યમથી આપે આવનારી પેઢીને પ્રદુષણમુકત બનાવવાનો મુખ્ય ધ્યેય રાખેલ છે તે બદલ ખુબ ખુબ અભિનંદન આપું છું. દેશ અને દુનિયા હાલનાં ગ્લોબલ વોર્મિંગનો સામનો કરી રહી છે, તેવા સમયે પ્રદુષણમુકત પર્યાવરણનો આપનો ઉમદા અભિગમ ખુબ જ પ્રશંસનીય છે. આપનું આ નવું સોપાન ઉત્તરોત્તર પ્રગતિ સાધે તેવી શુભકામનાઓ પાઠવું છું.

Annexure-C-2

Alang-Sosiya & Mathavda, Ta: Talaja, Dist: Bhavnagar to be scheduled on 20th October 2015.

Sir,

We have studied the draft EIA report of the above-mentioned project. Following are our observation/comments/questions regarding project and draft EIA report.

1. What was the previous land use of the land for proposed up-gradation? Has Industry obtained NA permission for the land? Please provide the document.
2. How the required land for the project is acquired? Was it a government or private land?
3. Is there any cost-benefit analysis carried out for proposed up-gradation project's benefits v/s loss of ecosystem including flora, fauna and vegetation?
4. What types of precautions will be taken for storage and transportation of hazardous material and waste?
5. Draft EIA report indicates that the water requirement will be fulfilled by bore well. Has Project proponent take necessary permission from local village panchayat for digging the bore well? Please submit necessary document.
6. Please give exact dates of ambient air quality, surface water, ground water, noise monitoring and soil quality monitoring.
7. What type of precautionary measures are to be taken to avoid negative impact of construction activities on marine environment, water quality, inter tidal and sub tidal habitat and sediment quality ?
8. How much land area is used for greenbelt development in existing facility and for proposed up-gradation?
9. What will be the impact of temporary housing availed by labors during construction phase on surrounding environment?
10. How many LOCAL people will get employment through this project? Please give classification of skilled and unskilled manpower.
11. What will be action plan for socio-economic development of an area by project proponent?
12. What activities industry will take up as a part of CSR and what will be the budget for it?
13. Please give detail list of people who will be responsible for implementation of EMP?

Yours truly,

Mahesh Parmar

CC: 1. Collector, Bhavnagar
2. Regional officer, GPCB, Bhavnagar

Paryavaran Mitra
502, Raj Avenue, Bhaikakanagar road
Thaltej, Ahmedabad - 380059
Telefax - 079-26851321
email - paryavaranmitra@yahoo.com
website - www.paryavaranmitra.org.in

Save Environment : Care for next Generation
Environment public hearing of
m/s Gujarat maritime board , dist. Bhavanagar, Gujarat

Annexure-C-3

Date 18 /10 / 2015 REPLY NOT SATISFACTORY

FOR MOST URGENT ATTN.

From :
Pravinbhai P. Sheth, A-8, Kalindi Appartment, Chikuwadi,Ankleshwar-393001, Gujarat.
Senior citizen : Technocrat & environmentalist
cell no. : 09377958840. , contact mail id – gcfastservice2@gmail.com

to, member secretary ,GPCB Gandhinagar, Gujarat, ms-gpcb@gujarat.gov.in
alteranate gpcbpublichearing@gmail.com
aternate unit1-uh-gpcb@gujarat.gov.in
cc collector & chair person,
environment public hearing, Dist. Bhavanagar. Gujarat collector-bha@gujarat.gov.in
regional officer Bhavanagar, Gujarat gpcb-bav@yahoo.com>,
addl. director,MoEF New Delhi, hota@nic.in

MoEF file no. 11-43 /2014 / IA III
REPLY OF PROPONENT DATED 13 OCT 15, IS NOT SATISFACTORY,
THE FACT IS THAT PROPONENT FAILED TO SUBMIT CONSULTANT'S QCI-NABET VALID ACCREDITED CERTIFICATE, IN EIA REPORT.

Sub: Environment public hearing of m/s Gujarat mary time board, tehsil Talaja, dist. Bhavanagar, Gujarat , schedule on 20 October 2015.
ToR issued on 22 Dec. 2014 by Director MoEF.
file no. 11-43 /2014 / IA III

Ref- proponents letter GMB/env/91©/EC/-JICA/6052 dt 13/10/15

Respected Hardik shah saheb,

REPLY OF PROPONENT DATED 13 OCT 15 ,IS NOT SATISFACTORY,
THE FACT IS THAT PROPONENT FAILED TO SUBMIT QCI-NABET VALID ACCREDITED CERTIFICATE IN EIA REPORT SO CONSULTANT WAS NOT ELIGIBLE TO PREPARE EIA REPORT

WE LEAVE IT UP TO REGULATORY AUTHORITY FOR FURTHER LINE OF ACTION.

thanks

(pravinbhai p sheth)
Senior citizen, technocrat & environmentalist
file – Gujarat maritime-bhavanagar-201015
pl. excuse, for any type .type setting / spelling / vocabulary mistakes if any.
WE ALL NEED A HELPING HAND – LET US PROTECT THE ENVIRONMENT

Draft REIA Report reviewed by Pravinbhai Sheth, Ankleshwar.cell 09377958840

Save Environment : Care for next Generation
Environment public hearing of
m/s Gujarat maritime board , dist. Bhavanagar, Gujarat

Date 18 /10 / 2015

FOR MOST URGENT ATTN.

From :
Pravinbhai P. Sheth, A-8, Kalindi Appartment, Chikuwadi,Ankleshwar–393001. Gujarat.
Senior citizen : Technocrat & environmentalist
cell no. : 09377958840.
contact mail id – gcfastservice2@gmail.com

to, member secretary ,GPCB, Gandhinagar, Gujarat, ms-gpcb@gujarat.gov.in
alteranate gpcbpublichearing@gmail.com
alternate unit1-uh-gpcb@gujarat.gov.in

cc collector & chair person,
environment public hearing, Dist. Bhavanagar. Gujarat collector-bha@gujarat.gov.in
regional officer Bhavanagar, Gujarat gpcb-bav@yahoo.com>,
addl. director,MoEF New Delhi, hota@nic.in

MoEF file no. 11-43 /2014 / IA III

We welcome all industrial progress and infrastructure progress of Gujarat, we are very positive, but we are of the opinion that EIA report – an important tool for success of environment public hearing-a-mandatory public consultation process and also a tool to set up an environmentally sustainable project in Gujarat, what is prepared by an Jharkhand based accredited consultant , IS NOT TO THE QUALITY MARK, with the reasoning that, referring to our citation, so many technical query attracted from report, according to our opinion, reliability and authenticity of this report MAY BE a big question mark.
We very humbly request all regulatory authorities like MoEF / QCI / CHAIRMAN-MS-GPCB, Chair person, dist. Environment public hearing, and other respective 'EC' committee & members, keeping in mind the regulatory compliance being a prime focus, without any bias approach to any individual, may be a proponent, may be a consultant, to view our comments seriously for an appropriate action as applicable, may be postponing the environment public hearing and asking for a VALID ACCREDITATION CERTIFICATE, *A fresh reliable report with cent % ToR compliance and bare minimum least possible* technical query- as- one should NOT take it granted that PUBLIC' will correct their report in environment public hearing - so why to review it before submitting to GPCB- such mindset, is setting a wrong precedence in Gujarat.

We strongly appeal, proponent has to submit CONSULTANT's QCI-NABET VALID ACCREDITED CERTIFICATE before the commencement hr. of environment public hearing-and- there should not be any scope to accept any logical, philosophical, hypothetical explanation-as- this is a mandatory requirement of MoEF –QCI / NABET.

We leave it up to the regulatory authority whether to accept our humble appeal or not.

Save Environment : Care for next Generation
Environment public hearing of
m/s Gujarat maritime board , dist. Bhavanagar, Gujarat

Sub: Environment public hearing of m/s Gujarat mary time board, tehsil Talaja, dist. Bhavanagar, Gujarat , schedule on 20 October 2015.
ToR issued on 22 Dec. 2014 by Director MoEF.
file no. 11-43 /2014 / IA III

Respected Hardik shah saheb,

We refer to the 'public notice', inviting a written response from public.

We have reviewed draft REIA report, which was uploaded on GPCB web site, and we forward herewith our positive written response, with a view to presuming, that our positive technical in puts may be of some use to proponent to improve quality of draft REAI report further to refine final EIA report, for a better presentation at MoEF.

Pl. obtain a satisfactory written reply from proponent, addressed to you, with a copy to us, and incorporate the same in MoM. pl. also note that, if reply will not be satisfactory, even in part there in, we will raise a supplementary query for same.

We would like to seek for some more information / clarifications about the project activities and it's mitigation measures to overcome likely collective negative adverse impacts as applicable on post commissioning of project., so, that, a project can be a environmentally sustainable one.

Desired EIA page nos. as given in section B & C are only an indicative one, and is provided for an easy reference to our query, as applicable.

With a view to looking at rapid industrialization, now it is a high time, to harmonize industrial growth with the environmental concerns and development OPTIONS under consideration should be environmentally sustainable one ,BASE LINE STUDIES & draft REIA report can often prevent future liabilities OR expensive alterations in project design, if presented in an effective way, and after all this is the concept of environment ministry Govt.of India.

We appreciate, MoEF- concept of 'environment public hearing, that It is a best tool to improve draft REIA report further with the support of all public, NGO , Technocrat and other concerns for environment protection.

Our detailed review findings are summarized as under,

section A foot notes- not the querry
section B Appreciations.
section C Likely attracted technical queries from draft REIA repo
section D Likely attracted general queries.
section E Suggestions to be implemented if acceptable & economically viable.
section F Tippani- not the critica

Save Environment : Care for next Generation
Environment public hearing of
m/s Gujarat maritime board , dist. Bhavanagar, Gujarat

Since EIA report is already uploaded on GPCB web site, all over the globe, for public viewing, any person can raise any of LIKELY ATTRACTED QURRIES as reported in section C & D. it was preferable, if report would have been previewed at least once by in house experts OR by external EHS experts, even at a little additional cost, so that a better improved quality EIA report would have been delivered to regulatory authorities.

PI correct and update final report as appropriately & confirm to us.

Likely attracted queries are only indicative one and supplementary one to improve upon the contents of the report, and it does not have any relation with any critic.
While quoting EIA page no / web no. some queries may be of a little repetitive nature type.

REVIEW FINDINGS

SECTION A FOOT NOTES – NOT THE QUERRY.

	comments
Web-11+	ToR compliance
Web 31 Chap1-7 to 1-10	MoEF CC ToR
Web 14 Chap 2 - 14	Project category A 7(b)
Web 45 18	Area 398803 ha.
19	Alang ship yard is not equipped with recycling of submarines and nuclear powered ships
44	Study are 5 km Study period March 15 to May 15.

SECTION B APPRECIATIONS

Sr no.	Comments
01	Project is a good support to mobilise a 'make in India' concept.
02	At full capacity, employment opportunities is projected to the tune of almost> 40, 000 persons and indirect employment as 5,00,000,
03	It is a proud of Gujarat that this expansion project is being set up at Gujarat.

Save Environment : Care for next Generation
Environment public hearing of
m/s Gujarat maritime board , dist. Bhavanagar, Gujarat

SECTION C EIA – Queries extracted from draft REIA report,

As such, QCI-NABET accredited environment consultant has to deliver a quality report, with cent % mandatory ToR compliance, & bare minimum least queries being extracted from EIA report, how ever , on our review studies, we observe many short falls, which needs to improve to justify 'status of accreditation'. It seems, a great scope is left to improve final report to a great extent before submitting it to MoEF for granting an EC.

We would like to seek, some more information about project activities, it's mitigation measures and due clarifications on shortfalls as extracted from report.

page wise queries reported herewith, for a due satisfactory explanations, where serially page no. not given, a web page is referred, for an easy and a quick reference- just not to waste valuable time of regulatory authorities, desired supporting pages, uploaded from GPCB web site, is also submitted herewith.

Reference cited of EIA web number / page numbers, are Indicative only.

sr no.	WEB pages	comments
04	Front page	On front page, environment consultant has submitted accreditation status, as certificate no. NABET / EIA /1013 /31, but ,it seems that it is validity date intentionally not mentioned, though it is there ,in fact, referring EIA , chapter 11, page 232, annexure 11.1, the validity period is mentioned as September 30, 2013, almost > 24 months over. It is very much surprising, that if referred Govt. of India enterprise environment consultant IS STILL CLAIMS AS ACREDITED CONSULTANT, then, it misleads the ToR (xii) mandatory 'undertaking' , pl. refer to chapter 1 page 10, with yellow icon. & pl. refer to web page 5 (EIA serially page no. not available!!!) It also misleads mandatory ToR xi compliance , pl. refer web page 15 (EIA serially page no. not available !!!), on this page validity period is mentioned as 07 February 2017. There may be any good reasoning to explain, on paper, may be logical, philosophical, hypothetical, BUT THE FACT IS THAT, the certificate no. as referred on front page is misleading, violated 'undertaking. (desired pages downloaded from report , are reproduced herewith) If the front page it self is misleading one, then how one can rely on other data, extracted short falls from report itself as referred on subsequent query, will justify this. We very humbly request all regulatory authorities like MoEF / QCI / CHAIRMAN-MS- GPCB, Chair person, dist. Environment public hearing, and other respective EC committee & members, keeping in mind the regulatory compliance being a prime focus, without

Save Environment : Care for next Generation
Environment public hearing of
m/s Gujarat maritime board , dist. Bhavanagar, Gujarat

		any bias approach to any individual, may be a proponent, may be a consultant, to view this issue seriously for an appropriate action as applicable.
05	Web page 5	This undertaking is not in order, as there are many misleading informations- as reported herewith.
06	Web page 7,8	Declaration is in order, duly stamped and signed, BUT consultant has failed to submit a valid official letter from QCI-NABET for 'FAE' to support base line studies period, is not submitted. Consultant's 13 pages high profile as mentioned on Chapter,11, page 225 to 237 does not support this. Even page 234, 235 does not support this, as this is almost 2 years old letter and does not justify status of base line studies period, and merely not justifying ' eligibility on EIA preparation'.
07	Web page 15	ToR xi- Remarks are misleading, There is no document as valid accreditation CERTIFICATE as mentioned validity period up to 7 February 2017, proceeding correspondence and progress letter-reminder sent by QCI-NABET can not be considered as a mandatory document, justifying ACCREDITATION CERITIFICATE. MANDATORY ToR COMPLIANCE IS MISLEADING ONE. ToR xii Front page ACCRETATION CERTIFICATE NUMBER IS MISLEADING- THERE IS NO SUCH DOCCUMENT TO JUSTIFY THIS 'QUOTE' ToR COMPLIANCE IS MISLEADING ONE.
08	EIA PAGES	comments
09	17,30,31, 34,36,39, 51, 52,53,77, 107,109, 110,111, 115,119, 120,121, 134, 150,158, 159,160, 161,162, (pages 165,166 ,206,OK as date is provided) Thanks.	Pl. provide date of photographs – to support base line studies period to the possible extent.- as applicable.
10		Query resolved
11	EIA CHAPER 1, PAGE 9	ToR general guide lines (with yellow icon) (ii)-all the pages ARE NOT serially numbered- i.e right from front page up to chapter 1, and after chapter 11, up to

Save Environment : Care for next Generation
Environment public hearing of
m/s Gujarat maritime board , dist. Bhavanagar, Gujarat

		end page (needless to mention, other consultant's EIA; reports has complied this set norms- so it this not difficult task to mention) iii) period / date of data collection, is not at all available on respective tables for each baseline period sample monitoring. such queries are already raised on subsequent EIA page numbers. (xi) ACCREDITATION CERTIFICATE part already discussed. Mandatory ToR COMPLIANCE IS NOT IN ORDER
12	EIA CHAPTER 1,PAGE 10	ToR (xii) Already discussed, ToR COMPLIANCE IS NOT IUN ORDER.
13	19	We are happy to learn from draft REIA report that you have made it very clear that Alang Sosia SRY is not equipped with recycling of submarines and nuclear powered ships, appreciated, Pl. provide information that how it will be informed to down the level senior staff as well
14	56,57	<u>Wind rose diagram</u>, Information provided just on 'wind speed' is not adequate, Pl. provide some more details on 01- start period and start hr. 02- end period and end hr. 03- total hrs. 04-total calm hrs. (just ,mentioning as 'summer season 2015', does not sound true details). It seems that other consultant's EIA reports are not viewed by consultant to provide desired information for a better clarity. Pl provide information on whether this studies were carried out by principal consultant OR by his sub contractual accredited consultant and who 'FAE' has carried out this study.
15	EIA pages 60+, 66+ 70+ 72 74 75+	In which 'approved lab', with it's contact details and valid approval status, all base line studies period samples were analysed, and during what actual period? Pl. provide the copy of scope of analytical parameters, on due approval given by MoEF / NABL as the case may be. Pl. refer to, Table 3.8 + on AAQ monitoring Table 3.13.1 + for SW Table 3.15 + for GW Table 3.16 for effluent analysis Table 3.18 for noise Table 3.21 for soil
16		<u>O1---Terrestrial ecology</u> Pl. provide information on what was the source and year of data OR who FAE has visualized all these data personally,

Save Environment : Care for next Generation
Environment public hearing of
m/s Gujarat maritime board , dist. Bhavanagar, Gujarat

		01---during what period, 02---with who villager presence, pl. quote the name if possible. 03--pl. provide a digital date photograph to support this if available.
		Pl. refer to
	77 to 86	Table 3.25 + all as applicable
		02---Marine ecology
		Pl. refery to
	87 to 90	Table 3.31 +
		03---Heavy metals
		In which approved lab and during what period this sample was analysed
		Pl. refer to,
	90	Table 3.36
		04---Traffic density measurement
		Pl. refer to,
	91,92.	Table 3.38
		05---Demographic pattern
		Pl. refer to,
	94	Table 3
17		Anticipated impacts
	103+	Pl provide MSDS for PCBs.
18	115	Is incinerator approved by CPCB or any other regulatory authority, Pl. provide such valid certificate. Will there be any possibility of emitting poisonous gases like dioxin / furan , if so ,pl. provide details with it's daily quantum and it's mitigation measures to safeguard environment from it's negative adverse impact on environment.
19	117	To treat daily 30 m3 effluent, in ETP, what is your design capacity ?
20	118	ETP 01--With reference to 30 m3 effluent inlet, pl. provide the qty. in diagram at each stage. 02---What will be daily treated effluent qty out put and what will be mode of disposal, do you have a written permission from GPCB for it's disposal and where to dispose off. 03---How much daily treated water will be reused. 04---Pl provide treated effluent specification and whether, every time it will comply set norms of GPCB., and IF NOT, then, what will be your firm measures.
21	119	What will be the expiry period of referred landfill site? Is this site is an approved one.
22	131+	We appreciate ,Isopleths of PM 10, SO2, NOX, is provided, Pl. provide the Isopleths for 'CO' also.
23	135,170	Green belt Details are not adequate, Ref. to EIA page 18, the total plot area as projected is as 398803 ha. Pl. provide some more vital information on,

Save Environment : Care for next Generation
Environment public hearing of
m/s Gujarat maritime board , dist. Bhavanagar, Gujarat

		01---so far how many trees already planted? (pl. also provide some supporting document to justify this) 02---how many trees will be planted now onwards (waiting for 'EC' not required for this noble cause) 03---what was survival rate for trees already planted? 04---what will be survival rate for trees proposed to be planted? 05---what area in m2 already covered for tr5ees already painted? 06---any tree plantation already carried out, out side of project area premises, if so, pl. provide details. 07---for such a massive tree plantation, have you included a cost of required TREE GUARDS in a environmental capital budget, if so, pl. provide details.
24	177	People's perception- Pl. provide some more information on, whether any stake holders, NGO, Govt employee, were consulted, if so, pl. provide details with period, location/s & a copy of MoM
25	178	CSR activities for FY 2015-16 01---It is very less & hardly budgeted for 24 lakhs only, pl. budget for some more amount. 02---Why no budget for celebration of environmental days and health hygiene days.
26	EIA 225	Disclosure of consultant Where is QCI extension letter no. NABET / EIA / RA022 / 047 dated 7 Feb. 14 Oct 2014, pl. provide the same. Annexure 11.1 is not the desired document!!! INFORMATION IS MISLEADING ONE
27	281 EIA PAGE 232,233	QCI CERTIFICATE 031, AND SCOPE OF ACREDITATIONVALIDITY 2013 , What is a value addition of this old dated letter as validity is already expired in September 2013, It is all to divert, PUBLIC' ATTN. INFORMATION IS MISLEADING ONE
28	EIA 234	QCI LETER 14 OCTOBER 2014, What is the value addition of this one year old letter, AS THIS IS NOT THE ACCREDITATION CERTIFICATE, ONE YEAR ALREADY OVER, PL. CONFIRM WHETHER ALL DUES ARE PAID, ALL NECESSARY ACTIONS TO CLOSE ALL Ncs / Obs / Alerts ARE TAKEN AND RESOLVED ALL THAT, THEN WHY QCI-NABET HAS NOT ISSUED ACCREDITATION CERTIFICATE? AT LEAST HAVE THEY ISSUED AN OFFICIAL LETTER THAT YOU ARE EIGIBLE TO PREPARE EIA REPORT, PROPR TO COMMNENCING BASE LINE STUDIES PERIOSD, i.e. PRIOR TO MARCH 15 (AS PER EIA PAGE 44), IF YES, PL. PROVIDE SUCH DOCUMENT BEFORE COMMENCEMENT OF START HRS OF ENVIRONMENT OUBLIC HEARING, SCHEDULE ON 20 OCTOBER 15, OTHERWISE AS PER SET NORMS, CONSULTANT WAS NOT ELIGIBLE TO START BASE LINE STUDIES AND PREPARE EIA REPORT- this ca be considered a serious non conformance of set norms and submitting a MIS- LEADING 'UNDERTAKING' & MISLEADING 'DECLARATION'

Save Environment : Care for next Generation
Environment public hearing of
m/s Gujarat maritime board , dist. Bhavanagar, Gujarat

29	236	NABL CERTIFICATE It's validity is OK, but it is subject to some T&C. PL. confirm, post issue date, i.e. 18/09/14, whether any annual surveillance was carried out, if so, when and whether final report was satisfactory to CONTINUE NABL ACCREDITATION to make you eligible to carry out analysis of various base line studies samples . It's validity is expired on 17/09/16, pl. confirm, whether a proactive action initiated for it's renewal, if so, pl. provide the copy of same. Are all the Base line studies samples tested al the way at KOLKATA, or at any other near place in Gujarat to econo9mise the testing cost, If so, pl. provide contact details of that particular labls with it's valid accreditation certificate justifying that particular address in it.

SECTION D General likely attracted questions

sr no.	comments
30	Pl. provide NABET-QCI as on date approved list for scope of accreditation-FAE.
31	What is the projected capital cost, What will be the payback period ?
32	What will be minimum qty of reserve fire water, that will be kept ready at any given point of time?
33	How far is the nearest 'public transport' from main entry gate of project site?
34	(a) How many assembly points you will have at project site? (b) Pl. provide evacuation path & evacuation procedure with plan lay out with north direction, specifying fire prone area , explosion prone areas and assembly point.
35	(a) How long construction period will continue? (b) In case if it prolongs for more than 1 year, what will be your mitigation measures to take care of any likely negative adverse impacts as like 'habitat disturbances'. © What will be your provision to provide drinking water and sanitation facilities for your construction contract workers. (d) At what minimum 'km' distance is a public transport from project site ? (e) How many construction workers will be employed during construction period?
36	Do you have a provision for PERT-CPM chart to ensure timely execution of of this multicrore project?
37	Pl. provide information on, has any part of work of draft REIA report preparation was entrusted to any of another consultant, by your retained environment consultant, if so, pl. provide his details and particularly, for which chapter studies, he was involved.
38	Has a set guide lines for proponent & that for consultant followed properly, pl. confirm
39	Though Gujarat Govt. can retain any better accredited consultant of their choice, as per their tender procedure, but, what was a special reason to assign

Save Environment : Care for next Generation
Environment public hearing of
m/s Gujarat maritime board , dist. Bhavanagar, Gujarat

	this very important job of preparing EIA report to 'Dist. Jharkhand' based consultant, far away from Gujarat. 01— Is it that there is no equivalent , better and reliable accredited environment consultant in Gujarat OR 02—is it that cost saving was considerable, as he was more economical, Inclusive cost of analysis of all the sample with his accredited lab. all the way at kolkata OR 03— Govt. dept. has to assign such multicrore project only to Govt. enterprise environment consultant ? who may be also far away from Gujarat. 04—Before assigning this job to 'referred consultant' who authorized person of 'Gujarat marytime board' has checked and verified his ' QCI-NABET valid accredited CERTIFICATE (as annexure 11.1 is not the ACCREDITED CERTIFICATE.,and for a mandatory terms, any type of logical, philosophical, hythothetical answers to satisfy, IS NOT ACCEPTABLE, AS THERE ARE NO SUPPORTING DOCUMENTS, & IT DEVIATEDS THE MANDATORY 'DECLARATION.', THE FACT IS THAT THERE IS NO COPY OF SUCH VALID ACCREDITED CERTIFICATE &
40	Pl. provide information on Risk assessment on likely 01—Natural disaster like tsunami 02—Man made Terrorist attach - bomb threat.

SECTION E Suggestions to be implemented if found acceptable and economically viable

	Comments
41	In case, if you will install a fire alarm system along with a power driven siren system, better to keep a provision of manual bells also at all fire prone areas.
42	In case if you owe your own in house, ambulance, pl ensure that your medical van / ambulance will have a certified medical oxygen filled in, in medical oxygen cylinder and not just 'oxygen', and keep test report always ready in ambulance for a periodical vigilant check..
43	Pl. budget some amount to uplift the society weaker class persons of project affected area, like senior citizens, widows, rejected female from society, dumb & deaf, blind, orphans, handicapped one etc.
44	Pl. refer to some case studies of last three FY, on major fire, took place at other units at other locations, examine the cause and mitigation measures of that and adopt an appropriate measures as a proactive action for this project also.
45	Pl. invite the participants of this environment public hearings, who has extended valuable in puts , when you commission the project, to witness your success.
46	Pl. donate generously to Gujarat 'beti bachao & kanya kelwani abhiyan', the unique awareness programme of Gujarat Govt, for sustaining female child.
47	Pl. encourage timber free construction as applicable.

Save Environment : Care for next Generation
Environment public hearing of
m/s Gujarat maritime board , dist. Bhavanagar, Gujarat

48	pl. involve senior citizens, retired technocrats, social workers , stake holders, *in a CSR committee / activities to seek their opinion for their valuable inputs.*
49	Pl. provide, under a humanity ground, a full medical treatment for employee diagnosed for TB, and /or for any other infectious disease, and provide full treatment to their close family members who are residing with him.
50	Pl. set up a female grievance resolving cell, as applicable, if yet not worked out.
51	Pl. enlist some external EHS expert for a regular visits to your group unit in future, and also for your established unit/s, so you can remain at par for 'EHS' related issues .
52	Pl. declare this unit as a gutkha / cigarette / tobacco FREE ZONE if yet not decided.

SECTION F - Tippani - not the criticism

Sr no.	Comments
53	LOOKING TO THE CREDIBILITY OF ' GUJARAT GOVT AND IT'S PROJECT, ONLY A SMALL REQUEST, In case, in future, if you may have to establish a new upcoming project OR going for expansion programme, & you will have to submit a draft REIA report to GPCB, you may retain services of any accredited environment consultant, what we appeal to you, pl. carry out pre-examination and review studies of draft REIA report, eighther 'in house' by your own experts, OR by your oqn retained accredited consultant, OR hire the services of some external professional EHS expert OR expert EIA reviewer (names can be referred on GPCB web site, MoM of environment public hearings) so that ,many of the ToR non compliances, short falls, as reported, can be taken care to avoid undue queries in environment public hearings OR with 'EC' committee, and you can submit a good quality draft REIA report to regulatory authorities, to justify your credibility and assuring an environmentally sustainable project in Gujarat . Hope , you will appreciate our positive feed back

This review studies is carried out with possible available time slot, it does not mean, that there may not be any more query, proponent /consultant is requested to review this report thoroghly again and then only prepare final report, incorporating just response recd. in environment public hearing is not the just end to justfy as a quality report.

Pl. do contact us for any further in puts OR for any query, pl. do not hesitate to inform us, in case, if we are wrong some where in our positive feed back.

We do welcome all projects supported by a good quality EIA reports.

thanks

(pravinbhai p sheth)
Senior citizen, technocrat & environmentalist
file – Gujarat maritime-bhavanagar-201015
pl. excuse, for any type .type setting / spelling / vocabulary mistakes if any.

WE ALL NEED A HELPING HAND – LET US PROTECT THE ENVIRONMENT

ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN

Proposed Upgradation of Existing Ship Recycling Yard at Alang Sosiya, Gujarat For Undertaking Safe and Environmentally Sound Ship Recycling Operations

Tehsil Talaja, District Bhavnagar, Gujarat

Report serial no. 11.S2.2015.EE.2205 August, 2015

Project Proponent

GUJARAT MARITIME BOARD
(Govt. of Gujarat Undertaking)
Sagar Bhavan
Sector 10-A,
Gandhinagar-382010

Environmental Consultant

MECON LIMITED
(A Govt. of India Enterprise)
Vivekananda Path
PO. Doranda
Dist – Ranchi, Jharkhand - 834002
CERTIFICATE NO: NABET/EIA/1013/031

GUJARAT MARITIME BOARD

Ref. No: GMB/Env/91(C)/EC-JICA/4686

UNDERTAKING

I, hereby undertake that the prescribed Terms of Reference with respect to EIA / EMP Studies for Proposed Upgradation of Existing Alang-Sosiya Ship Recycling Yard for undertaking safe and environmentally sound ship recycling operations located in Talaja Tehsil of Bhavnagar District, Gujarat has been complied with while conducting the EIA Studies. The content (information & data) as given by our consultant in the EIA Report are factually correct with full knowledge of the undersigned.

Date: 04/08/2015

Place: Gandhinagar

Dy. General Manager (Env.)
Environment Cell
Gujarat Maritime Board,
Gandhinagar, Gujarat

Head Office : Sector 10-A, "Chh" Road, Opp. Air Force Station, Gandhinagar - 382010. Gujarat (INDIA)
Phone : (91-079) 23238346/47/48/51, Fax : (91-079) 23234704, Tele-Fax : 079-23234705.
E-mail : info@gmbports.in **Website : www.gmbports.org**

मेकॉन लिमिटेड (भारत सरकार का संस्थान)
MECON LIMITED (A GOVERNMENT OF INDIA ENTERPRISE)

प्रधान कार्यालय (Head Office) : राँची-2, झारखण्ड, भारत, Ranchi-2, Jharkhand, India, फोन/Phone : 0651-2483000, फैक्स/Fax : 0651-2482189/2482214
ई-मेल/E-mail : ranchi@meconlimited.co.in, वेबसाइट/Website : http:// www.meconlimited.co.in
CIN No. : U74140JH1973GOI001199

Declaration by Experts contributing to the EIA for EIA/EMP Report for Proposed Upgradation of Alang-Sosiya Ship Recycling Yard, Dist. Bhavnagar, Gujarat

We, hereby certify that we were a part of the EIA/EMP report team in the following capacity that developed the above EIA.

EIA Coordinator:

Name: Suvamoy Adak

Signature & Date:

Period of Involvement: 01-02-2015, till date.

Contact Information: Ph: 0651-2481314; e-mail: envenggranchi@meconlimited.co.in

Functional Area Experts

Sl. No.	Functional Areas	Name of Expert	Involvement (Period & Task)	Signature
1.	AP	C.D. Goswami	Feb.,2015 till date Air Pollution Prevention, Monitoring & Control	
		S. Adak	01-02-2015 till date Air Pollution Prevention, Monitoring & Control	
2.	WP	S. Adak	01-02-2015 till date Water Pollution Prevention, Control & Prediction	
		Dr. Bipul Kumar	Feb.,2015 till date Water Pollution Prevention, Control & Prediction	
3.	SHW	Dr. Bipul Kumar	Feb.,2015 till date Solid Waste & Hazardous Waste Management	
4.	SE	Dr. S. Bhattacharya	Feb.,2015 till date Socio-economic studies.	
5.	EB	S. Adak	01-02-2015 till date Ecology and Biodiversity.	
6.	GEO	A.K. Mishra	Feb.,2015 till date Geology.	
7.	SC	Dr. S.K. Singh	Feb.,2015 till date Soil Conservation	
8.	AQ	Dr. V.V.S.N. Pinakapani	Feb., 2015 till date Meteorological and Air Quality Modeling and Prediction	
		Vishal Sharma	Feb., 2015 till date Meteorological and Air Quality Modeling and Prediction	
9.	NV	Dr. Vikas Kumar	Feb.,2015 till date Noise	

Major Offices:

नई दिल्ली/New Delhi
+91-11-2204 1201 (Phone)
+91-11-2284 1214 (Fax)
delhi@meconlimited.co.in

मुम्बई/Mumbai
+91-22-2781 2155-58 (Phone)
+91-22-2781 2275 (Fax)
mumbai@meconlimited.co.in

कोलकाता/Kolkata
+91-33-2282 2381-82 (Phone)
+91-33-2282 444' (Fax)
kolkata@meconlimited.co.in

चेन्नई/Chennai
+91-44-2618 4873 (Phone)
+91-44-2618 4874 (Fax)
chennai@meconlimited.co.in

बेंगलूरु/Bangalore
+91-80-2657 1661-63 (Phone)
+91-80-2657 6352 (Fax)
bangalore@meconlimited.co.in

Ref.

CONTINUATION SHEET

Sl. No.	Functional Areas	Name of Expert	Involvement (Period & Task)	Signature
10.	LU	Vishal Skaria	Feb., 2015 till date Land Use studies.	Vishal Skaria
11.	RH	D. Shashiraj	Feb., 2015 till date Risk Assessment & Hazard Management	
12.	HG	Dr. M. K. Mukhopadhyay	Feb., 2015 till date Hydrology, Ground water & Water Conservation	
		Palash Banerjee	Feb., 2015 till date Hydrology, Ground water & Water Conservation	

Declaration by the Head of the Accredited Consultant Organization

I, C.D. Goswami hereby confirm that the above mentioned experts prepared the EIA/EMP report for Proposed Upgradation of Alang Sosiya Ship Recycling Yard. I also confirm that I shall be fully accountable for any mis-leading information mentioned in this statement.

Signature:

Name: C.D Goswami

Designation: Jt. General Manager

सी० डी० गोस्वामी
(C. D. GOSWAMI)
संयुक्त महाप्रबंधक
(पर्यावरण अभियांत्रिकी प्रभाग)
Jt. General Manager
(Env. Engg. Sec.)
मेकॉन लिमिटेड,राँची-834002
MECON Ltd., Ranchi-834002

Name of the EIA Consultant Organization: MECON Limited

NABET Certificate No. & Issue Date: NABET/EIA/1013/031 dated, Oct., 01, 2010

मेकॉन लिमिटेड, राँची -- 2
MECON LIMITED, RANCHI - 2

Sl. No.	ToR	Chapters	Pages	Remarks
xi	The status of accreditation of the EIA consultant with NABET / QCI shall be specifically mentioned. The consultant shall certify that his accreditation is for the sector for which this EIA is prepared.	11	225-236	The EIA/EMP report has been prepared by MECON Limited, a Public Sector undertaking under the Ministry of Steel Government of India. MECON Limited is accredited by QCI/NABET for preparing EIA/EMP reports in 16 major sectors, including *"All Ship-breaking Yards including Ship-breaking Units"* vide their certificate no. NABET / EIA / 1013 / 031. This certificate is valid up to 7th February, 2017. Copy of certificate enclosed in Chapter 11 (as Annexure 11.1) of Report.
xii	The front page of EIA / EMP Reports, the name of the consultant / consultancy firm along with their complete details including their accreditation, if any, shall be indicated. The consultant while submitting the EIA / EMP Report shall give an undertaking to the effect that the prescribed TORs (TOR proposed by the project proponent and additional TOR given by the MoEF) have been complied with and the data submitted is factually correct (Refer MoEF office memorandum dated 4th August, 2009).		Page- B, C	Noted and complied. Front page of EIA Report gives necessary details of M/s MECON Ltd. the EIA Consultant firm . Signed undertaking by EIA Co-ordinator and involved Functional Area Experts of MECON on company letter-head enclosed in EIA Report.
xiii	While submitting the EIA / EMP Reports, the name of the experts associated with / involved in the preparation of these		Page-B, C,	Signed undertaking by EIA Co-ordinator and involved Functional Area Experts of MECON on company letter-head enclosed

(vii) Details of Environmental Management Plan and Environmental Monitoring Plan with parameters and costs be submitted

(viii) Submit the details of Oil Spill Contingent Management Plan.

(ix) Submit the details of Risk Assessment, Disaster Management Plan including emergency evacuation during natural and man-made disaster like floods, cyclone, tsunami and earth quakes etc.

General Guidelines

(i) The EIA document shall be printed on both sides, as for as possible.

(ii) All documents should be properly indexed, page numbered.

(iii) Period/date of data collection should be clearly indicated.

(iv) Authenticated English translation of all material provided in Regional languages.

(v) The letter/application for EC should quote the MoEF&CC File No. and also attach a copy of the letter prescribing the TOR.

(vi) The copy of the letter received from the Ministry on the TOR prescribed for the project should be attached as an annexure to the final EIA-EMP Report.

(vii) The final EIA-EMP report submitted to the Ministry must incorporate the issues in TOR and that raised in Public Hearing. The index of the final EIA-EMP report, must indicate the specific chapter and page no. of the EIA-EMP Report where the specific TOR prescribed by Ministry and the issue raised in the P.H. have been incorporated. Questionnaire related to the project (posted on MoEF&CC website) with all sections duly filled in shall also be submitted at the time of applying for EC.

(viii) Grant of TOR does not mean grant of EC.

(ix) Grant of TOR/EC to the present project does not mean grant of approvals in other regulations such as the Forest (Conservation) Act 1980 or the Wildlife (Protection) Act, 1972.

(x) Grant of EC is also subject to Circulars issued under the EIA Notification 2006, which are available on the MoEF&CC website: www.envfor.nic.in.

(xi) The status of accreditation of the EIA consultant with NABET/QCI shall be specifically mentioned. The consultant shall certify that his accreditation is for the sector for which this EIA is prepared.

(xii) On the front page of EIA/EMP reports, the name of the consultant/consultancy firm along with their complete details including their accreditation, if any shall be indicated. The consultant while submitting the EIA/EMP report shall give an undertaking to the effect that the prescribed TORs (TOR proposed by the project proponent and additional TOR given by the MoEF) have been complied with and the data submitted is factually correct (Refer MoEF office memorandum dated 4th August, 2009).

(xiii) While submitting the EIA/EMP reports, the name of the experts associated with/involved in the preparation of these reports and the laboratories through which the samples have been got analysed should be stated in the report. It shall clearly be indicated whether these laboratories are approved under the Environment (Protection) Act, 1986 and the rules made there under (Please refer MoEF office memorandum dated 4th August, 2009). The project leader of the EIA study shall also be mentioned.

(xiv) All the TOR points as presented before the Expert Appraisal Committee (EAC) shall be covered.

4. A detailed draft EIA/EMP report should be prepared in terms of the above additional ToRs and should be submitted to the State Pollution Control Board for conduct of Public Hearing. Public Hearing to be conducted for the project in accordance with the provisions of Environmental Impact Assessment Notification, 2006 and the issues raised by the public should be addressed in the Environmental Management Plan. The Public Hearing should be conducted based on the ToR letter issued by the Ministry and not on the basis of Minutes of the Meeting available on the web-site.

5. You are required to submit the detailed final EIA/EMP prepared as per ToRs including issues raised during Public Hearing to the Ministry for considering the proposal for environmental clearance within 3 years as per the MoEF&CC O.M. No.J-11013/41/2006-IA-II(I) (P) dated 08.10.2014.

6. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India/National Accreditation Board of Education and Training (QCI/NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other Organization(s)/Laboratories including their status of approvals etc. vide notification of the MoEF dated 19.07.2013.

7. The prescribed ToRs would be valid for a period of three years for submission of the EIA/EMP Reports.

(Dr.Manoranjan Hota)
Director

Copy to
The Member Secretary, Gujarat State Pollution Control Board, Paryavaran Bhawan, Sector 10 A, Gandhinagar-382 010, Gujarat.

ToR_Alang_Shipyard

Page 4 of 4

REMOVE THUS PAGE FROM COMMENTS

Annexure 1.2: MoM OF 147th Meeting of EAC

Minutes of the 147th Meeting of Expert Appraisal Committee For Projects related to Infrastructure Development, Coastal Regulation Zone, Building/Construction and Miscellaneous projects held on 23rd – 24th April, 2015 at Conference Hall (Narmada), Jal Wing, Ground Floor, Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-110003

Day1: Thursday, 23rd April, 2015

1. Opening Remarks of the Chairman.

The Chairman welcomed the Members to the 147th meeting of the Expert Appraisal Committee (EAC).

2. Confirmation of the Minutes of the 146th Meeting of the EAC held on 9th – 11th March, 2015 at New Delhi.

2.1 The EAC confirmed the minutes of the 146th meeting held on 9th – 11th March, 2015 at New Delhi subject to the following amendments:

(a) In item Number 3.18 namely "Construction of "RIVER ROSE" project at CTS No. 35C, 35C-1 to 12, Opp. Hiranandani Business Park, Saki Vihar Road, Tungwa Village, Andheri, Mumbai by M/s River Rose Developers Pvt. Ltd. – Environmental Clearance [F.No.21-91/2014-IA-III]", the Project Proponent (PP) informed that required information has been submitted to EAC however, it has been reflected in the minutes that EAC decided to seek clarification from local authority on norms for parking. Since the issue is general and not related to the project, PP requested to consider the project on merit. **The Committee after detailed deliberations recommended the proposal for grant of Environment Clearance subject to the following specific conditions:**

i. The quantity of fresh water usage, water recycling and rainwater harvesting shall be measured and recorded to monitor the water balance as projected by the PP. The record shall be submitted to the Regional Office, MoEF&CC and the Ground Water Authority along with six monthly Monitoring reports.

ii. The treated wastewater shall be recycled and reused for flushing of toilets, horticulture to reduce the demand of fresh water as committed.

iii. Solid waste shall be collected, treated and disposed according to rules.

iv. PP shall comply with the conditions of NOC/Clearance obtained from Fire Department.

v. The Operation and Maintenance of STP shall be made in the MoU with supplier. PP shall ensure the operation and maintenance of the STP.

vi. Parking facility with clear 6 m driveway shall be provided as committed.

11.0 DISCLOSURE OF CONSULTANT

The EIA/EMP report for upgradation and expansion of Alang-Sosiya Ship Recycling Yard of Gujarat Maritime Board (GMB) has been prepared by MECON Limited, a Public Sector undertaking under the Ministry of Steel Government of India. MECON Limited is accredited by QCI/NABET for preparing EIA/EMP reports in 16 major sectors, including "**All Ship breaking yards including Ship breaking units**" vide their certificate no. NABET/EIA/1013/031. This certificate was valid up to 30th September, 2013. The validity was extended up to 1st April, 2014 vide NABET's letter dated 13th Nov., 2013. Re-accreditation Assessment was carried out during 5th – 8th Feb., 2014, and based on same, accreditation of MECON has been renewed for 16 sectors as communicated by NABET (listed in **Table 11.1**). The validity has been extended up to 7th Feb., 2017 vide letter no. NABET/EIA/RA022/047dated 14th Oct., 2014. A copy of NABET certificate and renewal letter is attached as **Annexure 11.1.**

Table 11.1: Details of sectors accorded to MECON under the QCI-NABET scheme for accreditation of EIA consultant organization

Sr. No.	Sector Number		Name of the Sector	Category
	As per MoEFCC Notification	As per NABET Scheme		
1.	1 (a) (i)	1	Mining of minerals including Opencast / Underground mining	A
2.	1 (b)	2	Offshore and onshore oil and gas exploration, development & production	A
3.	1 (c)	3	River valley, hydel, drainage and Irrigation projects	A
4.	1 (d)	4	Thermal Power Plants	A
5.	2 (a)	6	Coal washeries	A
6.	2 (b)	7	Mineral beneficiation including pelletization	A
7.	3 (a)	8	Metallurgical industries (ferrous & non ferrous) – both primary and secondary	A
8.	3 (b)	9	Cement plants	A
9.	4 (b)	11	Coke oven plants	A
10.	6 (a)	27	Oil & gas transportation pipeline (crude and refinery / petrochemical products), passing through national parks / sanctuaries / coral reefs / ecologically sensitive areas including LNG terminal	A

Annexure 11.1: NABET Accreditation Certificate of MECON Ltd.

National Accreditation Board for Education & Training

Quality Council of India

CERTIFICATE OF ACCREDITATION

(CONDITIONAL)

M/s Mecon Limited
Ranchi - 834002

are hereby accorded conditional accreditation under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations (Rev 06, 2010) for the following scope/s:

Sl No.	Name of the Sector*	Category
1	Mining of minerals	A
2	Only offshore oil and gas exploration etc	A
3	River Valley, hydel, drainage and irrigation projects	A
4	Thermal Power Plants	A
5	Coal Washeries	A
6	Mineral beneficiation	A
7	Metallurgical industries	A
8	Cement Plants	A

Sl No.	Name of the Sector*	Category
9	Coke Oven Plants	A
10	Induction/ arc furnaces/ cupola furnaces etc	B
11	Oil & gas transportation pipeline	A
12	All ship breaking yards including ship breaking units	A
13	Industrial estates/ parks/ complexes/ areas, EPZs/ SEZs etc	A
14	Ports, harbours, jetties, marine terminals etc	A
15	Highways, railways etc	A
16	Common Municipal Solid Waste Management Facility	B

**Details are given in Annexure IA*

Accreditation to the above Sectors is subject to the EIA reports being prepared by the experts (EIA Coordinators & Functional Area Experts) mentioned in Annexure II and compliance to the Terms and Conditions mentioned in Annexure II.

Final Certificate of Accreditation shall be issued on fulfilment of the following conditions:

1. *Arranging in- house/ empanelled experts for Vibration and Soil.*

The Accreditation is subject to the compliance to Terms & Conditions mentioned in the QCI-NABET letter.

Certificate No: NABET/EIA/1013/031 ***Valid up to: September 30, 2013****

October 01, 2010
New Delhi

Director

Page 1 of 4

* Subject to
- Continual compliance to NABET Scheme and passing the consecutive yearly surveillance assessment.
- Updated status of accreditation should be verified from QCI website (www.qcin.org)

Annexure 1A

National Accreditation Board for Education & Training

Quality Council of India

QCI- NABET Scheme for Accreditation of EIA Consultant Organization

For Certificate No: NABET/ EIA/ 1013/ 031 *Valid up to: September 30, 2013#*

Scope of Accreditation

M/s Mecon Limited

Ranchi - 834002

are accredited for the following Sectors:

S. No.	Name of the Sector	Category
1.	Mining of minerals including Opencast/ Underground mining	A
2.	Only offshore oil and gas exploration, development & Production	A
3.	River Valley, hydel, drainage and irrigation projects	A
4.	Thermal Power Plants	A
5.	Coal washeries	A
6.	Mineral beneficiation including pelletisation	A
7.	Metallurgical industries (ferrous & non ferrous)- both primary and secondary	A
8.	Cement Plants	A
9.	Coke Oven Plants	A
10.	Induction/ arc furnaces/ cupola furnaces/ submerged arc furnace/ crucible furnace/ re-heating furnace of capacity more than 5 Tonne per heat	B
11.	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/ sanctuaries/ coral reefs/ ecologically sensitive areas including LNG terminal	A
12.	All ship breaking yards including ship breaking units	A
13.	Industrial estates/ parks/ complexes/ areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes	A
14.	Ports, harbours, jetties, marine terminals, break waters and dredging	A
15.	Highways, railways, transport terminals, mass rapid transport systems	A
16.	Common Municipal Solid Waste Management Facility (CMSWMF)	B

October 01, 2010
New Delhi

Director

Subject to
- Continual compliance to NABET Scheme and meeting the points during yearly surveillance assessment
- Updated status of accreditation should be verified from QCI website (www.qcin.org)

Page 2 of 4

National Accreditation Board
for Education and Training

NABET

NABET/EIA/RA022/047 Oct 14, 2014

The Deputy General Manager
Environmental Engineering Section
Mecon Limited
Doranda, Ranchi – 834002
(Kind Attention: **Mr. Manas K Mukhopadhyay**)

Dear Sir,

Sub: Re-Accreditation

This has reference to your application to QCI-NABET for re-accreditation (RA) as EIA Consultant Organization and the assessment carried for same in your organization from Feb. 05- 08, 2014.

We are pleased to inform you that based on the document and office assessments during RA, the *Accreditation Committee has approved renewal of accreditation given to your organization for a period of* three years from Feb. 08, 2014 to Feb. 07, 2017 subject to coverage of balance Functional areas and specific response to NCs/Obs./Alerts issued, if applicable (Refer Annexure III) with the following details:

1. *Annexure I* - *Scope of accreditation*
2. Annexure II - List of experts with approved sectors/ functional areas
3. Annexure III - Non-Conformances/ Observations/ Alerts (NCs/ Obs./ Alerts)
4. Annexure IV - Observations on Quality Management System (QMS)
5. Annexure V - Terms and conditions of accreditation
6. Annexure VI - Result of assessment
7. Annexure VII - Guidelines for addressing Major Non-Conformances/ Observations/ Alerts
8. Annexure VIII - Format to be followed for mentioning the names of the experts involved in EIA reports prepared by **Mecon Limited.**

Result of RA including Non-Conformances/ Observations/ Alerts (NCs/ Obs./ Alerts) applicable to your organization as per RA are also posted on QCI website vide minutes of the Accreditation Committee meetings dated Mar. 07, 2014, Mar. 28, 2014 and Apr. 25, 2014. You are requested to take necessary actions to close the NCs/ Obs. as per guidelines and timeframe mentioned in Annexure VII of this letter.

You are required to make all payments to NABET as applicable, within one month from the date of invoice sent to you. Continuation of this accreditation of your organization is subject to the clearance of all dues by your organization, satisfactory compliance to Annexure III and V.

With best regards,

Yours sincerely,

(Vipin Sahni)
C.E.O.

6th Floor, ITPI Building, 4-A, Ring Road, I P Estate, New Delhi - 110 002, India
Tel : +91-11-2332 3416 / 17 / 18 / 19 / 20 Fax : +91-11-2332 3415
e-mail : nabet@qcin.org Website : www.qcin.org

તા. ૧૭/૧૦/૨૦૧૫

પ્રતિશ્રી,

મુખ્ય સચિવશ્રી
ગુજરાત પ્રદેશ કિસાન કોંગ્રેસ કમિટી

વિષય : અલંગ નોટીફાઇડ એરીયામાં આવતા ગામોનો પ્રશ્ન...

જય ભારત સાથ જણાવવાનું કે ભાવનગર વિસ્તારના અલંગ નોટીફાઇડ એરીયામાં ૧૭ સતર ગામ લીધેલ છે. જેમાં ૧૦ દસ ગામ તળાજા તાલુકાના છે. અને ૭ સાત ગામ ઘોઘા તાલુકાના છે જેમાં ચણીયાળા નવાગામ ગરીબપુરા, ભાખલ, ગોરીયાળી. કંટાળા, કુકડ નો સમાવેશ થાય છે આ સાત ગામમાં મહેસુલ વિભાગ દ્વારા નવી શરતની જમીન માંથી ફરી શરત માં ફેરવવા માટે જંત્રીના ભાવ મુજબ ના ૨૫% પચ્ચીસ ટકા રકમ સરકારશ્રીમાં ભરવાનો નીયમ લાગુ પાડેલ છે. તો ઘોઘા તાલુકો પેસાકત તાલુકામાં આવે છે અને ખેતી માટે સીંચાઇ માટે કેનાલ વિસ્તાર છે નહી અને પાણીના તળ ઘણા ઉંડા હોવાથી ચોમાસુ પાક મહા મહેનતે સીઝન લઇ શકાય છે ચોમાસુ સીજન કુદરત ઉપર આધાર રહે છે તો નાનો ખેડુત ગરીબ ખેડુત અસંખ્ય મુશ્કેલી વેઠતો ખેડુત આવી પ્રીમીયમ ની રકમ જંત્રીના ભાવ મુજબની રકમ ૨૫% લેખે એકથી માંડીન દસ લાખ સુધીની થાય તો ખેડુતને પોતાના ગજા બહારનો બોજો આવી પડે એકબાજુ સરકાર રૂઠે એક બાજુ કુદરત રૂઠે તો ખેડુત ને આભઘાત કરવાનો વારો આવે તો રાજય સરકાર આવા નિયમોને રદ કરવા તાત્કાલીક ધ્યાન દોરે.

એજ લી.

ગામ : [redacted]
તા. ઘોઘા
જી. ભાવનગર.

11/2/2015

C-4

Date: 20/10/2015

To,
Member Secretary Shri
Gujarat Pollution Control Board
Bhavnagar

Sub: Question of the villages falling in Alang Notified Area

With Jaybharat it is to be informed that there are 17 villages included in Alang Notified Area in Bhavnagar. Out of which 10 villages are from Talaja Taluka and 7 villages are from Ghogha taluka. The 7 villages are Chaniyala, Navagam, Garibpura, Bhakhal, Goriyali and Kukad. In these seven villages, the Revenue Department has applied rule to pay 25% cost of Jantri to convert land from Navi Sharat to Juni Sharat. At these villages of the Ghogha taluka, there is no irrigation facility nor cannel for agriculture; and ground water table is also lower, so Ravi season crop can be cultivated with difficulties. The agriculture is dependent on monsoon season only. So it is very difficult to pay 25% cost of Jantri which is about from 1 to 10 lakhs for the small and poor farmers. Hence, the State Govt is requested to repeal the rule.

(Ramubhai Gohil)
Sarpanch
Village: Nava Gam (Nana)
Taluka: Ghogha

તા. ૨૦/૧૦/૨૦૧૫

પ્રતિશ્રી,
સભ્ય સચિવશ્રી
ગુજરાત પ્રદૂષણ નિયંત્રણ બોર્ડ
ગાંધીનગર

વિષય : અલંગ નોટીફાઇડ એરીયામાં આવતા ગામોનો પ્રશ્ન...

જય ભારત સાથ જણાવવાનું કે ભાવનગર વિસ્તારના અલંગ નોટીફાઇડ એરીયામાં ૧૭ સતર ગામ લીધેલ છે. જેમાં ૧૦ દસ ગામ તળાજા તાલુકાના છે. અને ૭ સાત ગામ ઘોઘા તાલુકાના છે જેમાં ચણીયાળા નવાગામ ગરીબપુરા, ભાખલ, ગોરીયાળી. કંટાળા, કુકડ નો સમાવેશ થાય છે આ સાત ગામમાં મહેસુલ વિભાગ દ્વારા નવી શરતની જમીન માંથી જુની શરત માં ફેરવવા માટે જંત્રીના ભાવ મુજબ ના ૨૫% પચ્ચીસ ટકા રકમ સરકારશ્રીમાં ભરવાનો નીયમ લાગુ પાડેલ છે. તો ઘોઘા તાલુકો પછાત તાલુકામાં આવે છે અને ખેતી માટે સીચાઇ માટે કેનાલ વિસ્તાર છે નહી અને પાણીના તળ ઘણા ઉંડા હોવાથી રવીપાક મહા મહેનતે સીઝન લઇ શકાય છે ચોમાસુ સીજન કુદરત ઉપર આધાર રહે છે તો નાનો ખેડુત ગરીબ ખેડુત અસંખ્ય મુશ્કેલી વેઠતો ખેડુત આવી પ્રીમીયમ ની રકમ જંત્રીના ભાવ મુજબની રકમ ૨૫% લેખે એકથી માંડીને દસ લાખ સુધીની થાય તો ખેડુતને પોતાના ગજા બહારનો બોજો આવી પડે એકબાજુ સરકાર રૂઠે એક બાજુ કુદરત રૂઠે તો ખેડુત ને આપઘાત કરવાનો વારો આવે તો રાજ્ય સરકાર આવા નિયમોને રદ કરવા તાત્કાલીક ધ્યાન દોરે.

એજ લી.

ગરીબપુરા
ગામ : ~~ચણીયાળા~~

તા. ઘોઘા

જી. ભાવનગર.

સરપંચશ્રી ગ્રામ પંચાયત
(ગામ) ગરીબપુરા

Date: 20/10/2015

To,
Member Secretary Shri
Gujarat Pollution Control Board
Bhavnagar

Sub: Question of the villages falling in Alang Notified Area

With Jaybharat it is to be informed that there are 17 villages included in Alang Notified Area in Bhavnagar. Out of which 10 villages are from Talaja Taluka and 7 villages are from Ghogha taluka. The 7 villages are Chaniyala, Navagam, Garibpura, Bhakhal, Goriyali and Kukad. In these seven villages, the Revenue Department has applied rule to pay 25% cost of Jantri to convert land from Navi Sharat to Juni Sharat. At these villages of the Ghogha taluka, there is no irrigation facility nor cannel for agriculture; and ground water table is also lower, so Ravi season crop can be cultivated with difficulties. The agriculture is dependent on monsoon season only. So it is very difficult to pay 25% cost of Jantri which is about from 1 to 10 lakhs for the small and poor farmers. Hence, the State Govt is requested to repeal the rule.

(L G Makwana)
Sarpanch
Village Garibpura
Bhakhal Group
Taluka: Ghogha

21-5

તા. ૧૯/૧૦/૨૦૧૫

પ્રતિશ્રી,

વિષય : અલંગ નોટીફાઇડ એરીયામાં આવતા ગામોનો પ્રશ્ન...

જય ભારત સાથ જણાવવાનું કે ભાવનગર વિસ્તારના અલંગ નોટીફાઇડ એરીયામાં ૧૭ સતર ગામ લીધેલ છે. જેમાં ૧૦ દસ ગામ તળાજા તાલુકાના છે. અને ૭ સાત ગામ ઘોઘા તાલુકાના છે જેમાં ચણીયાળા નવાગામ ગરીબપુરા, ભાખલ, ગોરીયાળી. કંટાળા, કુકડ નો સમાવેશ થાય છે આ સાત ગામમાં મહેસુલ વિભાગ દ્વારા નવી શરતની જમીન માંથી જુની શરત માં ફેરવવા માટે જંત્રીના ભાવ મુજબ ના ૨૫% પચ્ચીસ ટકા રકમ સરકારશ્રીમાં ભરવાનો નીયમ લાગુ પડેલ છે. તો ઘોઘા તાલુકો પંચાયત તાલુકામાં આવે છે અને ખેતી માટે સીંચાઇ માટે કેનાલ વિસ્તાર છે નહી અને પાણીના તળ ઘણા ઉંડા હોવાથી વર્ષોપાક મહા મહેનતે સીઝન લઇ શકાય છે ચોમાસુ સીજન કુદરત ઉપર આધાર રહે છે તો નાનો ખેડુત ગરીબ ખેડુત અસંખ્ય મુશ્કેલી વેઠતો ખેડુત આવી પ્રીમીયમ ની રકમ જંત્રીના ભાવ મુજબની રકમ ૨૫% લેખે એકથી માંડીન દસ લાખ સુધીની થાય તો ખેડુતને પોતાના ગજા બહારનો બોજો આવી પડે એકબાજુ સરકાર રૂઠે એક બાજુ કુદરત રૂઠે તો ખેડુત ને આભઘાત કરવાનો વારો આવે તો રાજય સરકાર આવા નિયમોને રદ કરવા તાત્કાલીક ધ્યાન દોરે.

અંજ લી.

સરપચ
ચણીયાળા ગ્રામ પંચાયત

ગામ : ચણીયાળા

તા. ઘોઘા

જી. ભાવનગર.

11/2015

Date: 20/10/2015

To,
Member Secretary Shri
Gujarat Pollution Control Board
Bhavnagar

Sub: Question of the villages falling in Alang Notified Area

With Jaybharat it is to be informed that there are 17 villages included in Alang Notified Area in Bhavnagar. Out of which 10 villages are from Talaja Taluka and 7 villages are from Ghogha taluka. The 7 villages are Chaniyala, Navagam, Garibpura, Bhakhal, Goriyali and Kukad. In these seven villages, the Revenue Department has applied rule to pay 25% cost of Jantri to convert land from Navi Sharat to Juni Sharat. At these villages of the Ghogha taluka, there is no irrigation facility nor cannel for agriculture and ground water table is also lower, so Ravi season crop can be cultivated with difficulties. The agriculture is dependent on monsoon season only. So it is very difficult to pay 25% cost of Jantri which is about from 1 to 10 lakhs for the small and poor farmers. Hence, the State Govt is requested to repeal the rule.

(A G Rav)
Sarpanch
Village Chaniyala
Taluka: Ghogha
Dist: Bhavnagar

211-9

તા. ૧૦/૧૦/૨૦૧૫

પ્રતિશ્રી,

[illegible]

વિષય : અલંગ નોટીફાઇડ એરીયામાં આવતા ગામોનો પ્રશ્ન...

જય ભારત સાથ જણાવવાનું કે ભાવનગર વિસ્તારના અલંગ નોટીફાઇડ એરીયામાં ૧૭ સતર ગામ લીધેલ છે. જેમાં ૧૦ દસ ગામ તળાજા તાલુકાના છે. અને ૭ સાત ગામ ઘોઘા તાલુકાના છે જેમાં સણીયાળા નવાગામ ગરીબપુરા, ભાખલ, ગોરીયાળી. કંટાળા, કુકડ નો સમાવેશ થાય છે આ સાત ગામમાં મહેસુલ વિભાગ દ્વારા નવી શરતની જમીન માંથી જુની શરત માં ફેરવવા માટે જંત્રીના ભાવ મુજબ ના ૨૫% પચ્ચીસ ટકા રકમ સરકારશ્રીમાં ભરવાનો નીયમ લાગુ પાડેલ છે. તો ઘોઘા તાલુકો પંચાયત તાલુકામાં આવે છે અને ખેતી માટે સીંચાઇ માટે કેનાલ વિસ્તાર છે નહી અને પાણીના તળ ઘણા ઉંડા હોવાથી ચોમાસુ પાક મહા મહેનતે સીઝન લઇ શકાય છે ચોમાસુ સીજન કુદરત ઉપર આધાર રહે છે તો નાનો ખેડુત ગરીબ ખેડુત અસંખ્ય મુશ્કેલી વેઠતો ખેડુત આવી પ્રીમીયમ ની રકમ જંત્રીના ભાવ મુજબની રકમ ૨૫% લેખે એકથી માંડીને દસ લાખ સુધીની થાય તો ખેડુતને પોતાના ગજા બહારનો બોજો આવી પડે એકબાજુ સરકાર રૂઠે એક બાજુ કુદરત રૂઠે તો ખેડુત ને આભઘાત કરવાનો વારો આવે તો રાજ્ય સરકાર આવા નિયમોને રદ કરવા તાત્કાલીક ધ્યાન દોરે.

એજ લી.

ગામ : ~~[illegible]~~

તા. ઘોઘા

જી. ભાવનગર.

[illegible]

Date: 20/10/2015

To,
Member Secretary Shri
Gujarat Pollution Control Board
Bhavnagar

Sub: Question of the villages falling in Alang Notified Area

With Jaybharat it is to be informed that there are 17 villages included in Alang Notified Area in Bhavnagar. Out of which 10 villages are from Talaja Taluka and 7 villages are from Ghogha taluka. The 7 villages are Chaniyala, Navagam, Garibpura, Bhakhal, Goriyali and Kukad. In these seven villages, the Revenue Department has applied rule to pay 25% cost of Jantri to convert land from Navi Sharat to Juni Sharat. At these villages of the Ghogha taluka, there is no irrigation facility nor cannel for agriculture and ground water table is also lower, so Ravi season crop can be cultivated with difficulties. The agriculture is dependent on monsoon season only. So it is very difficult to pay 25% cost of Jantri which is about from 1 to 10 lakhs for the small and poor farmers. Hence, the State Govt is requested to repeal the rule.

Sarpanch
Village Bhakhal
Taluka: Ghogha

સી-૬

તા. ૧૦ / ૧૧ / ૨૦૧૫

પ્રતિશ્રી, જિલ્લા કલેક્ટર

ભાવનગર

વિષય : અલંગ નોટીફાઇડ એરીયામાં આવતા ગામોનો પ્રશ્ન...

જય ભારત સાથ જણાવવાનું કે ભાવનગર વિસ્તારના અલંગ નોટીફાઇડ એરીયામાં ૧૭ સતર ગામ લીધેલ છે. જેમાં ૧૦ દસ ગામ તળાજા તાલુકાના છે. અને ૭ સાત ગામ ઘોઘા તાલુકાના છે જેમાં ચણીયાળા નવાગામ ગરીબપુરા. ભાખલ, ઘોરીયાળી. કંટાળા, કુકડ નો સમાવેશ થાય છે આ સાત ગામમાં ઔદ્યોગીક વિભાગ દ્વારા નવી શરતની જમીન માંથી જુની શરત માં ફેરવવા માટે જંત્રીના ભાવ મુજબ ના ૨૫% પચ્ચીસ ટકા રકમ સરકારશ્રીમાં ભરવાનો નીયમ લાગુ પડેલ છે. તો ઘોઘા તાલુકો પંચાયત તાલુકામાં આવે છે અને ખેતી માટે સીંચાઇ માટે કેનાલ વિસ્તાર છે નદી અને પાણીના તળ ધણા ઉંડા હોવાથી ચોમાસા મહા મહેનતે સીઝન લઇ શકાય છે ચોમાસુ સીજન કુદરત ઉપર આધાર રહે છે તો નાનો ખેડુત ગરીબ ખેડુત અસંખ્ય મુશ્કેલી વેઠતો ખેડુત આવી પ્રીમીયમ ની રકમ જંત્રીના ભાવ મુજબની રકમ ૨૫% લેખે એકથી માંડીન દસ લાખ સુધીની થાય તો ખેડુતને પોતાના ગના બહારનો બોજો આવી પડે એકબાજુ સરકાર કુદે એક બાજુ કુદરત કુદે તો ખેડુત ને આઘાત કરવાનો વારો આવે તો રાજય સરકાર આવા નિયમોને રદ કરવા તાત્કાલીક ધ્યાન દોરે.

એજ લી.

ગામ : [redacted]

સરપંચ-નવાગામ(ઘોઘા)

તા. ઘોઘા

જી. ભાવનગર

C-8

Date: 20/10/2015

To,

The District Collector Shri
Bhavnagar

Sub: Question of the villages falling in Alang Notified Area

With Jaybharat it is to be informed that there are 17 villages included in Alang Notified Area in Bhavnagar. Out of which 10 villages are from Talaja Taluka and 7 villages are from Ghogha taluka. The 7 villages are Chaniyala, Navagam, Garibpura, Bhakhal, Goriyali and Kukad. In these seven villages, the Revenue Department has applied rule to pay 25% cost of Jantri to convert land from Navi Sharat to Juni Sharat. At these villages of the Ghogha taluka, there is no irrigation facility nor cannel for agriculture; and ground water table is also lower, so Ravi season crop can be cultivated with difficulties. The agriculture is dependent on monsoon season only. So it is very difficult to pay 25% cost of Jantri which is about from 1 to 10 lakhs for the small and poor farmers. Hence, the State Govt is requested to repeal the rule.

Sarpanch, Bhakhal, Taluka: Ghogha

Sarpanch, Garibpura – Bhakhal Group Taluka: Ghogha

Sarpanch, Chaniyala - Taluka: Ghogha

Sarpanch, Nava Gam (Nana) - Taluka: Ghogha

ગુજરાત મેરીટાઇમ બોર્ડ દ્વારા રખાયેલ લોક સુનાવણી ના વાંધાઓ બાબત તા ૨૦.૧૦.૨૦૧૫

૧. સુચિત પ્રોજેક્ટ રીપોર્ટ માં જણાવ્યા મુજબ હાલ અલંગ ખાતે રોડ, મકાન વગેરેના કામમાં CRZ દ્વારા ક્લીયરન્સ લીધુ નથી.તેમજ CRZ માં થતી ગેરકાયદેસર પ્રવૃતિઓ ને અટકાવવા ગુજરાત મેરીટાઇમ બોર્ડ દ્વારા શું નક્કર પગલાં લેવામાં આવ્યા છે તે જણાવશો.

૨. સુચિત પ્રોજેક્ટ ના અનુસંધાન માં જણાવવાનું કે માન.સુપ્રિમ કોર્ટ દ્વારા રીટ પીટીશન નં.૬૫૭/૯૫ ના પ્રમાણે ભારત ભરમાં શીપ રીસાયકલીંગ યાર્ડ ખાતે કોઇ પણ જગ્યાએ નવું શીપ રીસાયકલીંગ યાર્ડ જો શરૂ કરવાનું હોય તો સૌપ્રથમ કોર્ટ ની મંજૂરી લેવી જરૂરી છે. તો આ મંજૂરી લીધેલ છે કે નહિ તે યોગ્ય ખુલાસો કરશો.

૩.રીપોર્ટના અનુસંધાને જણાવવાનું કે હાલમાં અલંગ ખાતે આવેલ ગેરકાયદેસર વસાહતો,હોસ્પીટલ, લેબર કોલોની તેમજ કામદારો માટે નાં બિલ્ડીંગ આ બધા જ મકાનો તેમજ વસાહતો ની અંદર સુએજ પ્લાન્ટ ની વ્યવસ્થા નથી.તો નવી બિલ્ડીંગ તેમજ વસાહતો માટે કેવી રીતે આપી શકાય?

૪. સુચિત પ્રોજેક્ટ મુજબ જે ડ્રાય ડોક બનવાના છે તે જગ્યાએ આવેલ મેઇન ગ્રુ અને આજુબાજુ ની જમીન ઉપર આવેલ વનસ્પતીઓને પારાવાર નુકસાન થશે જે બાબતની નોંધ લેશો.

૫. સુચિત નવા પ્રોજેક્ટ માં જે નવા ૧૫ પ્લોટો બનવાનાં છે તેની પોલીસી શું રહેશે ? આજ સુધી માં હયાત પ્લોટો ની પોલીસી પણ આવેલ નથી. તો આ નવા પ્લોટો ની પોલીસી શું હશે તે બાબત ખુલાસો કરવાં વિનંતી.

૬. ડ્રાય ડોક માં આપના રીપોર્ટ માં જણાવ્યા મુજબ યોગ્ય સફાઇ થયા બાદ જહાજ નું બીર્ચીંગ કરવામાં આવશે તેવું જણાવાયેલ છે.આ બાબત કઇ રીતે શક્ય બને કારણ કે નામ. કોર્ટ ના આદેશ મુજબ એક વખત જહાજ બીચ થયા બાદ ટેકનીકલી આ જહાજ ને પાછું રીફ્લોટ કરી શકાતુ નથી તેમજ તેમાંથી એસબેસટોસ. ઓઇલ.ઇન્સ્યુલેટીંગ મટિરીયલ કાઢી લેવામાં આવનાર હોય જહાજ નું મેઇન એન્જિન ચાલુ થઇ શક નહિ.તો આ જહાજ ને ફરીથી કઇ રીતે બીર્ચીંગ કરી શકાય તો આ બાબત ખુલાસો કરશો.

૭.હાલ ગુજરાત મેરીટાઇમ બોર્ડ દ્વારા અલંગ ખાતે આવેલ કામદારોને પીવાનું પાણી તેમજ વપરાશ માટેનું પાણી યોગ્ય અને પુરતાં પ્રમાણમાં મળી શકતું નથી તો આ સુચિત નવા પ્રોજેક્ટ માં શુધ્ધ પીવા લાયક અને વપરાશ માટેના પાણી ની પૂરતી અને યોગ્ય વ્યવસ્થા કઇ રીતે કરવામાં આવશે તે જણાવશો

Objections regarding Public Hearing conducted by Gujarat Maritime Board on 20/10/2015

1. In proposed project report, at Alang, CRZ Clearance for Building, Roads etc. have been obtained and what steps have been taken by GMB to prevent illegal activities in CRZ area.
2. With reference to current project, it is to mention that as per Supreme Court Order issued in WP 657/95, in any new yard is to be created, permission from Supreme Court is required. So if such permission for this project has been obtained or not be clarified.
3. As per Report, at present there is no sewage treatment plants available in any illegal population/colonies of labours at Alang. So in new building how can you provide such facilities in buildings?
4. In proposed project, the place where dry docks are planned, there are variety of mangroves and other vegetation will be affected which may be noted.
5. New 15 plots which are to be developed in proposed project for which what is policy for those plots as till date there is no policy for existing plots.
6. As mentioned the report, after cleaning the vessels, beaching will be carried out. In this connection, it is asked that how this will be possible to refloat the vessel as per SC order once ship is beached and insulating materials, engines, asbsestos are removed. How can same vessel be beached in such condition may please be clarified.
7. Under current situation, workers at Alang are not provided with adequate water for drinking and other purposes by GMB. So in the proposed project, is there is provision by GMB to provide clean drinking water and other purpose and how the same will be arranged?

1. Shri Vanrajsinh Dhirubha Gohil
2. Shri Jatubhai Ajitsinh Gohil
3. Shri Anopsinh N Gohil
4. Shri Himmatbhai Kalubhai Dabhi
5. Shri Pradipsinh Pravinsinh Gohil
6. Shri Pravinsinh Dhirubha Gohil
7. Shri Premjibhai Bhavanbhai Rathod
8. Shri Vipulbhai Najabhai Dihora
9. Shri Mithabhai Becharbhai Solanki
10. Shri Bharatbhai Dulabhai Dihora
11. Shri Rajdeepsinh P. Gohil
12. Shri Mahavirsinh D. Gohil
13. Shri Gilabhai Valabhai Dihora

ગુજરાત મેરીટાઇમ બોર્ડ દ્વારા રખાયેલ લોક સુનાવણી ના વાંધાઓ બાબત તા ૨૦.૧૦.૨૦૧૫

૧. સુચિત પ્રોજેક્ટ રીપોર્ટ માં જણાવ્યા મુજબ હાલ અલંગ ખાતે રોડ, મકાન વગેરેના કામમાં CRZ દ્વારા ક્લીયરન્સ લીધુ નથી.તેમજ CRZ માં થતી ગેરકાયદેસર પ્રવૃતિઓ ને અટકાવવા ગુજરાત મેરીટાઇમ બોર્ડ દ્વારા શું નક્કર પગલાં લેવામાં આવ્યા છે તે જણાવશો.

૨. સુચિત પ્રોજેક્ટ ના અનુસંધાન માં જણાવવાનું કે માન.સુપ્રિમ કોર્ટ દ્વારા રીટ પીટીશન નં.૬૫૭/૯૫ ના પ્રમાણે ભારત ભરમાં શીપ રીસાયકલીંગ યાર્ડ ખાતે કોઇ પણ જગ્યાએ નવું શીપ રીસાયકલીંગ યાર્ડ જો શરૂ કરવાનું હોય તો સૌપ્રથમ કોર્ટ ની મંજૂરી લેવી જરૂરી છે. તો આ મંજૂરી લીધેલ છે કે નહિ તે યોગ્ય ખુલાસો કરશો.

૩.રીપોર્ટના અનુસંધાને જણાવવાનું કે હાલમાં અલંગ ખાતે આવેલ ગેરકાયદેસર વસાહતો,હોસ્પીટલ, લેબર કોલોની તેમજ કામદારો માટે નાં બિલ્ડીંગ આ બધા જ મકાનો તેમજ વસાહતો ની અંદર સુએજ પ્લાન્ટ ની વ્યવસ્થા નથી.તો નવી બિલ્ડીંગ તેમજ વસાહતો માટે કેવી રીતે આપી શકાય?

૪. સુચિત પ્રોજેક્ટ મુજબ જે ડાય ડોક બનવાના છે તે જગ્યાએ આવેલ મેઇન ગ્રુ અને આજુબાજુ ની જમીન ઉપર આવેલ વનસ્પતીઓને પારાવાર નુકસાન થશે જે બાબતની નોંધ લેશો.

૫. સુચિત નવા પ્રોજેક્ટ માં જે નવા ૧૫ પ્લોટો બનવાનાં છે તેની પોલીસી શું રહેશે ? આજ સુધી માં હયાત પ્લોટો ની પોલીસી પણ આવેલ નથી. તો આ નવા પ્લોટો ની પોલીસી શું હશે તે બાબત ખુલાસો કરવાં વિનંતી.

૬. ડાય ડોક માં આપના રીપોર્ટ માં જણાવ્યા મુજબ યોગ્ય સફાઇ થયા બાદ જહાજ નું બીચીંગ કરવામાં આવશે તેવું જણાવાયેલ છે.આ બાબત કઇ રીતે શક્ય બને કારણ કે નામ. કોર્ટ ના આદેશ મુજબ એક વખત જહાજ બીચ થયા બાદ ટેકનીકલી આ જહાજ ને પાછું રીફ્લોટ કરી શકાતુ નથી તેમજ તેમાંથી એસબેસટોસ, ઓઇલ,ઇન્સ્યુલેટીંગ મટિરીયલ કાઢી લેવામાં આવનાર હોય જહાજ નું મેઇન એન્જિન ચાલુ થઇ શકે નહિ.તો આ જહાજ ને ફરીથી કઇ રીતે બીચીંગ કરી શકાય તો આ બાબત ખુલાસો કરશો.

૭.હાલ ગુજરાત મેરીટાઇમ બોર્ડ દ્વારા અલંગ ખાતે આવેલ કામદારોને પીવાનું પાણી તેમજ વપરાશ માટેનું પાણી યોગ્ય અને પુરતાં પ્રમાણમાં મળી શકતું નથી તો આ સુચિત નવા પ્રોજેક્ટ માં શુધ્ધ પીવા લાયક અને વપરાશ માટેના પાણી ની પૂરતી અને યોગ્ય વ્યવસ્થા કઇ રીતે કરવામાં આવશે તે જણાવશો

Objections regarding Public Hearing conducted by Gujarat Maritime Board on 20/10/2015

1. In proposed project report, at Alang, CRZ Clearance for Building, Roads etc. have been obtained and what steps have been taken by GMB to prevent illegal activities in CRZ area.
2. With reference to current project, it is to mention that as per Supreme Court Order issued in WP 657/95, in any new yard is to be created, permission from Supreme Court is required. So if such permission for this project has been obtained or not be clarified.
3. As per Report, at present there is no sewage treatment plants available in any illegal population/colonies of labours at Alang. So in new building how can you provide such facilities in buildings?
4. In proposed project, the place where dry docks are planned, there are variety of mangroves and other vegetation will be affected which may be noted.
5. New 15 plots which are to be developed in proposed project for which what is policy for those plots as till date there is no policy for existing plots.
6. As mentioned the report, after cleaning the vessels, beaching will be carried out. In this connection, it is asked that how this will be possible to refloat the vessel as per SC order once ship is beached and insulating materials, engines, asbsestos are removed. How can same vessel be beached in such condition may please be clarified.
7. Under current situation, workers at Alang are not provided with adequate water for drinking and other purposes by GMB. So in the proposed project, is there is provision by GMB to provide clean drinking water and other purpose and how the same will be arranged?

1. Shri Vanrajsinh Dhirubha Gohil
2. Shri Himmatbhai Kalubhai Dabhi
3. Shri Jatubhai Ajitsinh Gohil
4. Shri Pradipsinh Pravinsinh Gohil
5. Shri Pravinsinh Dhirubha Gohil
6. Shri Mithabhai Becharbhai Solanki
7. Shri Vipulbhai Najabhai Dihora
8. Shri Rajdeepsinh P. Gohil
9. Shri Mahavirsinh D. Gohil
10. Shri Gilabhai Valabhai Dihora
11. Shri Bharatbhai Dulabhai Dihora

C-22

ગુજરાત મેરીટાઇમ બોર્ડ દ્વારા રખાયેલ લોક સુનાવણી ના વાંધાઓ બાબત તા ૨૦.૧૦.૨૦૧૫

૧. સુચિત પ્રોજેક્ટ રીપોર્ટ માં જણાવ્યા મુજબ હાલ અલંગ ખાતે રોડ, મકાન વગેરેના કામમાં CRZ દ્વારા ક્લીયરન્સ લીધુ નથી.તેમજ CRZ માં થતી ગેરકાયદ્સર પ્રવૃતિઓ ન અટકાવવા ગુજરાત મેરીટાઇમ બોર્ડ દ્વારા શું નક્કર પગલાં લેવામાં આવ્યા છે તે જણાવશો.

૨. સુચિત પ્રોજેક્ટ ના અનુસંધાન માં જણાવવાનું કે માન.સુપ્રિમ કોર્ટ દ્વારા રીટ પીટીશન નં.૬૫૭/૯૫ ના પ્રમાણે ભારત ભરમાં શીપ રીસાયકલીંગ યાર્ડ ખાતે કોઇ પણ જગ્યાએ નવું શીપ રીસાયકલીંગ યાર્ડ જો શરૂ કરવાનું હોય તો સૌપ્રથમ કોર્ટ ની મંજૂરી લેવી જરૂરી છે. તો આ મંજૂરી લીધેલ છે કે નહિ તે યોગ્ય ખુલાસો કરશો.

૩. રીપોર્ટના અનુસંધાને જણાવવાનું કે હાલમાં અલંગ ખાતે આવેલ ગેરકાયદેસર વસાહતો,હોસ્પીટલ, લેબર કોલોની તેમજ કામદારો માટે નાં બિલ્ડીંગ આ બધા જ મકાનો તેમજ વસાહતો ની અંદર સુએજ પ્લાન્ટ ની વ્યવસ્થા નથી.તો નવી બિલ્ડીંગ તેમજ વસાહતો માટે કેવી રીતે આપી શકાય?

૪. સુચિત પ્રોજેક્ટ મુજબ જે ડાય ડોક બનવાના છે તે જગ્યાએ આવેલ મેઇન રૂ અને આજુબાજુ ની જમીન ઉપર આવેલ વનસ્પતીઓને પારાવાર નુકસાન થશે જે બાબતની નોંધ લેશો.

૫. સુચિત નવા પ્રોજેક્ટ માં જે નવા ૧૫ પ્લોટો બનવાનાં છે તેની પોલીસી શું રહેશે ? આજ સુધી માં હયાત પ્લોટો ની પોલીસી પણ આવેલ નથી. તો આ નવા પ્લોટો ની પોલીસી શું હશે તે બાબત ખુલાસો કરવાં વિનંતી.

૬. ડાય ડોક માં આપના રીપોર્ટ માં જણાવ્યા મુજબ યોગ્ય સફાઇ થયા બાદ જહાજ નું બીર્ચીંગ કરવામાં આવશે તેવું જણાવાયેલ છે.આ બાબત કઇ રીતે શક્ય બને કારણ કે નામ. કોર્ટ ના આદેશ મુજબ એક વખત જહાજ બીચ થયા બાદ ટેકનીકલી આ જહાજ ને પાછું રીફ્લોટ કરી શકાતુ નથી તેમજ તેમાંથી એસબેસટોસ. ઓઇલ.ઇન્સ્યુલેટીંગ મટિરીયલ કાઢી લેવામાં આવનાર હોય જહાજ નું મેઇન એન્જિન ચાલુ થઇ શકે નહિ.તો આ જહાજ ને ફરીથી કઇ રીતે બીર્ચીંગ કરી શકાય તો આ બાબત ખુલાસો કરશો.

૭. હાલ ગુજરાત મેરીટાઇમ બોર્ડ દ્વારા અલંગ ખાતે આવેલ કામદારોને પીવાનું પાણી તેમજ વપરાશ માટેનું પાણી યોગ્ય અને પુરતાં પ્રમાણમાં મળી શકતું નથી તો આ સુચિત નવા પ્રોજેક્ટ માં શુધ્ધ પીવા લાયક અને વપરાશ માટેના પાણી ની પૂરતી અને યોગ્ય વ્યવસ્થા કઇ રીતે કરવામા આવશે તે જણાવશો

Objections regarding Public Hearing conducted by Gujarat Maritime Board on 20/10/2015

1. In proposed project report, at Alang, CRZ Clearance for Building, Roads etc. have been obtained and what steps have been taken by GMB to prevent illegal activities in CRZ area.
2. With reference to current project, it is to mention that as per Supreme Court Order issued in WP 657/95, in any new yard is to be created, permission from Supreme Court is required. So if such permission for this project has been obtained or not be clarified.
3. As per Report, at present there is no sewage treatment plants available in any illegal population/colonies of labours at Alang. So in new building how can you provide such facilities in buildings?
4. In proposed project, the place where dry docks are planned, there are variety of mangroves and other vegetation will be affected which may be noted.
5. New 15 plots which are to be developed in proposed project for which what is policy for those plots as till date there is no policy for existing plots.
6. As mentioned the report, after cleaning the vessels, beaching will be carried out. In this connection, it is asked that how this will be possible to refloat the vessel as per SC order once ship is beached and insulating materials, engines, asbsestos are removed. How can same vessel be beached in such condition may please be clarified.
7. Under current situation, workers at Alang are not provided with adequate water for drinking and other purposes by GMB. So in the proposed project, is there is provision by GMB to provide clean drinking water and other purpose and how the same will be arranged?

1. Shri Anopsinh Nirmalsinh Gohil
2. Shri Pradipsinh Pravinsinh Gohil
3. Shri Himmatbhai Kalubhai Dabhi
4. Shri Vanrajsinh Dhirubha Gohil
5. Shri Jatubhai Ajitsinh Gohil
6. Shri Premjibhai Bhavanbhai Rathod
7. Shri Vipulbhai Najabhai Dihora
8. Shri Mithabhai Becharbhai Solanki
9. Shri Rajdeepsinh P. Gohil
10. Shri Mahavirsinh D. Gohil
11. Shri Gilabhai Valabhai Dihora
12. Shri Bharatbhai Dulabhai Dihora

C-12

ગુજરાત મેરીટાઇમ બોર્ડ દ્વારા રખાયેલ લોક સુનાવણી ના વાંધાઓ બાબત તા ૨૦.૧૦.૨૦૧૫

૧. સુચિત પ્રોજેક્ટ રીપોર્ટ માં જણાવ્યા મુજબ હાલ અલંગ ખાતે રોડ, મકાન વગેરેના કામમાં CRZ દ્વારા ક્લીયરન્સ લીધુ નથી. તેમજ CRZ માં થતી ગેરકાયદેસર પ્રવૃતિઓ ને અટકાવવા ગુજરાત મેરીટાઇમ બોર્ડ દ્વારા શું નક્કર પગલાં લેવામાં આવ્યા છે તે જણાવશો.

૨. સુચિત પ્રોજેક્ટ ના અનુસંધાન માં જણાવવાનું કે માન. સુપ્રિમ કોર્ટ દ્વારા રીટ પીટીશન નં. ૬૫૭/૯૫ ના પ્રમાણે ભારત ભરમાં શીપ રીસાયકલીંગ યાર્ડ ખાતે કોઇ પણ જગ્યાએ નવું શીપ રીસાયકલીંગ યાર્ડ જો શરૂ કરવાનું હોય તો સૌપ્રથમ કોર્ટ ની મંજૂરી લેવી જરૂરી છે. તો આ મંજૂરી લીધેલ છે કે નહિ તે યોગ્ય ખુલાસો કરશો.

૩. રીપોર્ટના અનુસંધાને જણાવવાનું કે હાલમાં અલંગ ખાતે આવેલ ગેરકાયદેસર વસાહતો, હોસ્પીટલ, લેબર કોલોની તેમજ કામદારો માટે નાં બિલ્ડીંગ આ બધા જ મકાનો તેમજ વસાહતો ની અંદર સુએજ પ્લાન્ટ ની વ્યવસ્થા નથી. તો નવી બિલ્ડીંગ તેમજ વસાહતો માટે કેવી રીતે આપી શકાય?

૪. સુચિત પ્રોજેક્ટ મુજબ જે ડાય ડોક બનવાના છે તે જગ્યાએ આવેલ મેઇન ગ્રુ અને આજુબાજુ ની જમીન ઉપર આવેલ વનસ્પતીઓને પારાવાર નુકસાન થશે જે બાબતની નોંધ લેશો.

૫. સુચિત નવા પ્રોજેક્ટ માં જે નવા ૧૫ પ્લોટો બનવાનાં છે તેની પોલીસી શું રહેશે ? આજ સુધી માં હયાત પ્લોટો ની પોલીસી પણ આવેલ નથી. તો આ નવા પ્લોટો ની પોલીસી શું હશે તે બાબત ખુલાસો કરવાં વિનંતી.

૬. ડાય ડોક માં આપના રીપોર્ટ માં જણાવ્યા મુજબ યોગ્ય સફાઇ થયા બાદ જહાજ નું બીચીંગ કરવામાં આવશે તેવું જણાવાયેલ છે. આ બાબત કઇ રીતે શક્ય બને કારણ કે નામ. કોર્ટ ના આદેશ મુજબ એક વખત જહાજ બીચ થયા બાદ ટેકનીકલી આ જહાજ ને પાછું રીફ્લોટ કરી શકાતુ નથી તેમજ તેમાંથી એસબેસ્ટોસ, ઓઇલ, ઇન્ફ્યુલેટીંગ મટિરીયલ કાઢી લેવામાં આવનાર હોય જહાજ નું મેઇન એન્જિન ચાલુ થઇ શકે નહિ. તો આ જહાજ ને ફરીથી કઇ રીતે બીચીંગ કરી શકાય તો આ બાબત ખુલાસો કરશો.

૭. હાલ ગુજરાત મેરીટાઇમ બોર્ડ દ્વારા અલંગ ખાતે આવેલ કામદારોને પીવાનુ પાણી તેમજ વપરાશ માટેનું પાણી યોગ્ય અને પુરતાં પ્રમાણમાં મળી શકતું નથી તો આ સુચિત નવા પ્રોજેક્ટ માં શુધ્ધ પીવા લાયક અને વપરાશ માટેના પાણી ની પૂરતી અને યોગ્ય વ્યવસ્થા કઇ રીતે કરવામાં આવશે તે જણાવશો

Objections regarding Public Hearing conducted by Gujarat Maritime Board on 20/10/2015

1. In proposed project report, at Alang, CRZ Clearance for Building, Roads etc. have been obtained and what steps have been taken by GMB to prevent illegal activities in CRZ area.
2. With reference to current project, it is to mention that as per Supreme Court Order issued in WP 657/95, in any new yard is to be created, permission from Supreme Court is required. So if such permission for this project has been obtained or not be clarified.
3. As per Report, at present there is no sewage treatment plants available in any illegal population/colonies of labours at Alang. So in new building how can you provide such facilities in buildings?
4. In proposed project, the place where dry docks are planned, there are variety of mangroves and other vegetation will be affected which may be noted.
5. New 15 plots which are to be developed in proposed project for which what is policy for those plots as till date there is no policy for existing plots.
6. As mentioned the report, after cleaning the vessels, beaching will be carried out. In this connection, it is asked that how this will be possible to refloat the vessel as per SC order once ship is beached and insulating materials, engines, asbsestos are removed. How can same vessel be beached in such condition may please be clarified.
7. Under current situation, workers at Alang are not provided with adequate water for drinking and other purposes by GMB. So in the proposed project, is there is provision by GMB to provide clean drinking water and other purpose and how the same will be arranged?

1. Shri Vanrajsinh Dhirubha Gohil
2. Shri Jatubhai Ajitsinh Gohil
3. Shri Himmatbhai Kalubhai Dabhi
4. Shri Pradipsinh Pravinsinh Gohil
5. Shri Premjibhai Bhavanbhai Rathod
6. Shri Mithabhai Becharbhai Solanki
7. Shri Rajdeepsinh P. Gohil
8. Shri Mahavirsinh D. Gohil
9. Shri Vipulbhai Najabhai Dihora
10. Shri Gilabhai Valabhai Dihora
11. Shri Bharatbhai Dulabhai Dihora

ANNEXURE - I

REPLIES TO COMMENTS OF Mr.PRAVINBHAI P. SHETH

ToR Point No.	Comment	Gujarat Maritime Board's Reply
xi	NABET QCI Accreditation Certificate submitted in Annex 11.1 is Not Valid One	The Copy of NABET's Initial certificate issued to MECON in Oct., 2010 and valid up to 30-09-2013 has been given on Pages 232 & 234 of the EIA Report (as pages 1 & 2 of 4 of Annexure 11.1). Copy of NABET's Letter No. NABET / EIA / RA022 / 047 dated Oct.14, 2014 which is a communication that the validity of MECON's Accreditation has been extended up to Feb., 07, 2017 been given on Pages 234 & 235 of the EIA Report (as pages 3 & 4 of 4 of Annexure 11.1). No new Certificate has been issued. The List of Accredited Consultants for Various Sectors are given in MoEFCC's Website. This list is updated every month. MECON is listed as Sl. No. 101 in the list updated on 07 Sept., 2015.
	a. Proponent Undertaking, which itself is controversial. b. NABET-QCI payment reminder letter dated Oct.14, 2014. c. NABET-QCI payment reminder letter dated June 17, 2013 in name of Terracon Ecotech Pvt. Ltd., Annex 11.3, which is self certified, Is It NABET Accredited Certificate, Where is Word Like Certificate? d. NABET-QCI Scope of Accreditation	The undertaking given by Gujarat Maritime Board (the project proponent is mandatory as per MoEFCC's Notification No. **J-11013/41/ 2006-IA.II(I) dated 05 Oct., 2011**. The Copy of NA BET's Letter No. NABET/EIA/RA022/047 dated Oct.14, 2014 is a communication that the validity of MECON's Accreditation has been extended up to Feb., 07, 2017. Some baseline environmental data generation work had been outsourced to M/s Terracon Ecotech Pvt. Ltd. by MECON. It is a requirement that such work can be outsourced only to parties with accreditation from concerned authorities. The copy of letter enclosed indicates the same. Nevertheless MECON on their own have full accreditation to undertake the work outsourced to M/s Terracon Ecotech Pvt. Ltd.. The work carried out by M/s Terracon Ecotech Pvt. Ltd. was under MECON's supervision. NABET-QCI Scope of Accreditation is available in NABET's website.

ToR Point No.	Comment	Gujarat Maritime Board's Reply
	All above documents referred as a, b, c, d in no way justify Annex 11.1 as Accredited Certificate. Everything is very much confusing and misleading.	
	Referred ToR Cannot be considered as Compliance	The Coverage of ToR Points given at the beginning of the report, indicates the Chapters, Clause Nos. And Page nos. where the issues raised in the ToR have been addressed. In the "Remarks" column the gist of the issues(s) have been given very briefly.
xiii	a. NABL accreditation certificate is OK	
	b. It is not clear in section. 3.1 to 3.4 that where (at which location) various baseline samples were analysed.	The Co-ordinates of the air and water sampling stations are clearly mentioned in the relevant tables in Chapter 3 of the EIA Report. Some of the parameters were analysed at Alang itself by M/s Mitra S.K. Pvt. Ltd. Using instruments they had set up at Alang. Other parameters were analysed after transporting the preserved samples to their laboratory at Kandla. It is not necessary to mention the location of the laboratory in the EIA Report.
	c. Even if we take it granted, that it is analysed at Kolkata based NABL lab, then is it that all the samples were analysed at Kolkata where by unnecessarily loading heavy financial burden on Gujarat Govt.	This question is irrelevant.
	d. Please provide actual date of sampling and actual date of starting of analysis of all baseline studies samples being analysed at Kolkata based NABL lab.	The dates of collection of ambient air quality samples have been given in Tables 3.9.1, 3.9.2, 3.9.3, 3.9.4, 3.9.5 in the EIA Report. Work Zone Air Quality samples were collected at the SRY Plots on 12 April, 2015 and at the TSDF site on 10 April, 2015

ToR Point No.	Comment	Gujarat Maritime Board's Reply
		The dates of ambient noise monitoring area: At Alang Fire Station – 2 & 3 May, 2015; At Village Alang & Village Kathava – 1 & 2 May, 2015; At Village Sosiya: 28 & 29 April, 2015; At Village Mathavda – 3 & 4 May, 2015. At Village Chopada – 13 & 14 April, 2015; At Village Bharpara – 15 & 16 April, 2015. Sea Water Samples were Collected on 31 May, 2015. Ground water and Effluent Samples were collected on 30 May, 2015. Soil samples were collected on 30 May, 2015.
	e. In case, if any of samples was analysed by any other lab, then please provide its approval details and in particular, which samples were analysed.	All samples were analysed by M/s Mitra S.K. Pvt. Ltd.
	f. Is there not any approved lab in Gujarat?	MECON has empanelled a number of accredited laboratories for carrying out baseline environmental data generation work after inviting bids from all over the country. Baseline environmental data generation work is assigned to these laboratories only after a laid down tendering process. M/S Mitra S.K. Pvt. Ltd. Is one of the empanelled laboratories and their bid was successful in this case. Any accredited laboratory in India is welcome to apply to MECON for empanelment. If their application is successful, they shall be asked to submit their bids for baseline environmental data generation work whenever the opportunity arises.
Additional Query	On each EIA page at header side, name of proponent is not mentioned, but project activity is mentioned. Core question is, why name of project proponent is not mentioned? Is there any reservation on disclosing proponent's name – A Gujarat Govt. Project and if not please incorporate name of project proponent at each header site on each EIA page nos. And confirm.	The EIA/EMP Report is for a Specific Project and not for a Project Proponent. However Gujarat Maritime Board has submitted an undertaking as per the mandatory MoEFCC's Notification No. **J-11013/41/ 2006-IA.II (I) dated 05 Oct., 2011.** The name of the project proponent has been mentioned clearly on the cover page along with the project title on each page.

D-2

GUJARAT MARITIME BOARD

GMB/Env/91(C)/EC-JICA/6159
Date: 17/10/2015

To,

Shri Mahesh Parmar
502, Raj Avenue, Bhaikakanagar road
Thaltej, Ahmedabad-380059
Telefax-079-26851321

Sub: Response to the questions/comments of Shri Mahesh Parmar towards Environment Public hearing for proposed project of upgradation of existing ship recycling yard at Alang, Ta: Talaja, Dist: Bhavnagar of Gujarat Maritime Board scheduled on 20th October 2015

Ref: Your queries reference no: PM/MP/2629/2015

Sir,

With reference to your questions/comments raised towards the Environmental public hearing for proposed project of upgradation of existing ship recycling yard at Alang, Ta: Talaja, Dist: Bhavnagar. Kindly find attach herewith the point wise reply attached as **Annexure-I** for your kind information.

Regards,

Yours faithfully,

Encl: as above

(**Atul Sharma**)
Dy. General Manager-Env.

Copy Submitted to:

The Regional Officer, Gujarat Pollution Control Board, Plot no: 1154/2-B, Ghogha Circle, Sir Patni Road, Bhavnagar 364004

Head Office : Sector - 10/A, "Chh" Road, Opp. Air Force Station, Gandhinagar - 382010. Gujarat (INDIA)
Phone : (91-079) 23238346-47-48-51 Fax : (91-079) 23234704 Telefax : 079-23234705
E-mail : gmbad1@sancharnet.in Website : www.gmbports.org

ANNEXURE - I

Replies to Queries raised by Mr. Mahesh Parmar

<table>
<tr><th>Point No.</th><th>Query Raised</th><th>Reply</th></tr>
<tr><td>1</td><td>What was the previous land use of the land for the proposed project? Has Industry obtained NA permission for the land? Please provide the document.</td><td>The project comprises of four components and its land related details:
<table>
<tr><th>Sr.No</th><th>Project Component</th><th>Land related details</th></tr>
<tr><td>A.</td><td>(1)Upgradation of Existing ship recycling plots (total 70 plots in Phase-I and remaining plots will be upgraded in Phase-II)</td><td>Proposed activity of improvement of floor of the plots will take place in the existing plots therefore no land acquisition will be required.</td></tr>
<tr><td></td><td>(2) Development of 15 new ship recycling plots</td><td>Development of these plots will come up in the intertidal area and therefore no land is proposed to be acquired or transferred.</td></tr>
<tr><td>B.</td><td>Hazardous Material Removal pre-treatment facility. (Constructing two nos of dry dock facility for ships for pre-cleaning of hazardous materials and wastes)</td><td>The proposed dry dock facilities will be developed between High Tide Line, Low Tide Line and beyond LTL i.e off-shore hence no land is proposed to be acquired.</td></tr>
<tr><td>C.</td><td>Environmental facilities</td><td>The proposed facilities will be developed within the existing TSDF site of GMB at Alang.</td></tr>
<tr><td>D.</td><td>Labour welfare infrastructure</td><td>The proposed infrastructure will be developed within the GMB's acquired land hence no land acquisition is required.</td></tr>
</table></td></tr>
<tr><td>2</td><td>How the required land for the project is acquired. Was it Government Land or Private Land?</td><td>As described under point No:1, as such there is fresh land is required. Existing land which is now under used and proposed to be used inupgradation was once government waste land transferred in the name of GMB.</td></tr>
</table>

Point No.	Query Raised	Reply
3	Is there any cost benefit analysis carried out for proposed up-gradation project's benefits vs loss of ecosystem including flora, fauna and vegetation	The cost benefit analysis from rationalization of resources point of views are portrayed in EIA report in Table No 2 by comparison of resource requirements between producing equal tonnageof steel by conventional route and that by the ship recycling route. Similarly, the comparison in land requirement and waste generation between an actual production of equal tonnage/ yearwith reference to integrated steel plant and Alang-Sosiya Ship Recycling Yard is given in Table 2.2 of the EIA Report. So long as proposed upgradation project is concerned, there is no loss of ecosystem as no fresh land is required. Alang coast is having low degree of biological activities due to a) high turbidity, b) strong current of sea and high tidal current together c) already ship recycling operation is continued since 1982 and coast is devoid of productive ecosystem like mangroves, sand dunes, corals, fisheries, wetlands, mudflats etc hence possibility of loss of ecosystem is minimum.
4	What types of precautions will be taken for storage and transportation of hazardous materials and wastes?	LPG is one hazardous material which is used in gas torch for iron plate cutting. The Cylinders of LPG are stored on each plot in as per PESO guidelines. The same practice will be adopted in proposed upgradation. Other hazardous materials which are left and found no use in reuse, recycle or re-process, these materials as per properties exhibited as defined in Hazardous Waste (Management, Handling and Transboundary movement) Rules-2008 are stored, transported, treated and disposed as per CPCB Guidelines at TSDF, Alang. The same is described in Chapter 4 in detail in the EIA report.
5	Draft EIA Report indicates that water requirement will be fulfilled by bore-wells. Has project proponent taken permission from local village panchayats for digging bore-wells? Please submit the document	Presently, water is availed from Mahi –Pariaj Water supply scheme through pipe line for 1 MLD which is self-sufficient at present. There has been no additional bore well dug by GMB or ship recyclers so far. Water from existing wells from villages are purchased by ship recyclers for domestic usages during lean period and sometime shortfall from GMB's supply.
6	Please give exact dates of ambient air quality, surface water, ground water, noise and soil quality monitoring.	The dates of collection of ambient air quality samples have been given in Tables 3.9.1, 3.9.2, 3.9.3, 3.9.4, 3.9.5 in the EIA Report. Work Zone Air Quality samples were collected at the SRY Plots on 12 April, 2015 and at the TSDF site on 10 April, 2015

Point No.	Query Raised	Reply
		The dates of ambient noise monitoring area: At Alang Fire Station – 2 & 3 May, 2015; At Village Alang& Village Kathava – 1 & 2 May, 2015; At Village Sosiya: 28 & 29 April, 2015; At Village Mathavda – 3 & 4 May, 2015. At Village Chopada – 13 & 14 April, 2015; At Village Bharpara – 15 & 16 April, 2015. Sea Water Samples were Collected on 31 May, 2015. Ground water and Effluent Samples were collected on 30 May, 2015. Soil samples were collected on 30 May, 2015.
7	What type of precautionary measures are to be taken to avoid negative impact of construction activities on marine environment, water quality, inter-tidal and sub-tidal habitat and sediment quality	Construction activities are proposed in inter tidal and marine area in respect of improvement of plots and construction of dry docks. It may be brought to the notice that Gulf waters are having turbidity of about 200 NTU which seems inherently so high. This does not support photo synthetic activity. So long as habitat area is concerned, this area does not exhibit such marine habitat area including fisheries. Hence no negative impacts are envisaged.
8	How much land area has been used for green belt development in existing facility and for proposed upgradation	A 5 m wide strip of land along the plots' boundary walls on the outside has been used for green belt development. This area is interrupted by the plots' entry gates.Thus, it is proposed to develop 6 ha of green belt under the proposed upgradation project.
9	What will be impact of temporary housing availed by labours during construction phase on surrounding environment	Most construction workers will be local villagers. The other skilled workers required during construction phase will be temporarily housed in the workers' barracks which are under construction and will be soon ready. Rest shelters with drinking water facilities and sanitary toilet blocks will be built and commissioned for the workers as close as possible to the construction site(s) while constructing approach roads to the work sites. These will minimise impacts of influx of construction workers.
10	How many local people will get employment through this project? Please give classification of skilled and unskilled labours.	Roughly, there will be a direct employment to the tune of 400000 to 50000 labors at Plots which not only consist of Gujarat labours but also harbours labours from Orissa, Jharkhand, UP etc. These all will be employed after imparting training in GMB's run Safety Training Institute at Alang. So all these labours are semi skilled to skilled labours. Currently Government of India under Ministry of Skill Development launched a program for skill

Point No.	Query Raised	Reply
		development has started a centre at Alang for imparting training to Skill development among these labours. So our target is to convert all labours into fully skilled labours. So long as indirect employment is concerned, it is estimated to cater such employment in order of up 1.5 to 2 lakhs in indirect employment at far flung industries, transportation, garages, groceriesetc. Skilled workers are those who have learnt or taken specialised training in specific trades. These include Gas Cutters, Welders, Riggers, Crane Operators, Electricians, Vehicle Mechanics, Lathe Machine operators etc. Unskilled workers are those workers who have not learnt in particular trade and work in whatever jobs which do not require any special training such as loading & unloading of goods from trucks, material sorting, simple agricultural work, conservancy work etc.
11	What will be action plan for socio-economic development of an area by project proponent?	GMB action plan includes but not limited toproviding financial assistance for celebration of various festivals and cultural events. GMB alsoorganises health camps for local villagers. GMP distributes books & stationary, school bags, uniforms, socks & shoes to village school children. Every year similar works / activities will be undertaken in consultation with local villagers.
12	What activities industry will take up as a part of CSR and what will be the budget for it	It may be noted that project itself is proposed for enhancing safety and welfare of the labours engaged in ship recycling and end result will be safer and environmentally sound ship recycling. The project itself is CSR activity to ongoing existing ship recycling yards so after implementation, not only more employment will be generated but precious resources as indicated at Sr No 3 are directly saved. The cost of the project is 1630 crores approximately. However for visible CSR activities are proposed in form of housing hospital community hall, community school etcRs 150 Crores are provided.
13	Please give detail list of people who will be responsible for implementation of EMP	There is multi-layer governance system for implementation of Environment Management System of the project. From Project Proponent side, Japan International Cooperation Agency and GMB will be responsible for implementation of EMP. From Regulatory agencies GPCB, MoEF&CC, Bhopal regional office will carry out monitoring of the project.

D-3

GUJARAT MARITIME BOARD

GMB/Env/91(C)/JICA/CAMP Alang-I
Date: 20/10/2015

To,

Shri Pravinbhai P. Sheth
A-8, Kalindi Appartment,
Chikuwadi, Ankleshwar-393001
(M) 09377958840

Sub: Response to the comments of Shri Pravinbhai P. Sheth towards Environment Public hearing for proposed project of upgradation of existing ship recycling yard at Alang, Ta: Talaja, Dist: Bhavnagar of Gujarat Maritime Board scheduled on 20th October 2015

Sir,

With reference to your comments raised through E-mail dated 19th October 2015 towards the Environmental public hearing for proposed project of upgradation of existing ship recycling yard at Alang, Ta: Talaja, Dist: Bhavnagar. Kindly find attach herewith the point wise reply attached as Annexure-I for your kind information.

Regards,

Yours faithfully,

Encl: as above

(Atul Sharma)
Dy. General Manager (Env.)

Copy Submitted to:

The Regional Officer, Gujarat Pollution Control Board, Plot no:1154/2-B, Ghogha Circle, Sir Patni Road, Bhavnagar 364004

Head Office : Sector - 10/A, "Chh" Road, Opp. Air Force Station, Gandhinagar - 382010. Gujarat (INDIA)
Phone : (91-079) 23238346-47-48-51 Fax : (91-079) 23234704 Telefax : 079-23234705
E-mail : gmbad1@sancharnet.in Website : www.gmbports.org

ANNEXURE - I

Detailed review findings are summarized as under,

section A foot notes- not the querry. (Query no. 1 to 3)

section B Appreciations (Query no. 1 to 3).

section C Likely attracted technical queries from draft REIA repo (Query no. 4 to 29)

section D Likely attracted general queries (Query no. 30-40).

section E Suggestions to be implemented if acceptable & economically viable (Query No. 41-52).

section F Tippani- not the critica (Query no. 53)

REVIEW FINDINGS SECTION FOOTNOTES - NOT THE QUERRY.

	Comments
Web-b-11 +	ToR compliance
Web 31 Chap1-7 to 1-10	MoEF CC ToR
Web 14 Chap 2 -14	Project category A 7(b)
Web 45 18	Area 398803 ha.
19	Alang ship yard is not equipped with recycling of submarines and nuclear powered ships
44	Study are 5 km Study period March 15 to May 15.

Sr. No.	**Comment**	**Gujarat Maritime Board's Reply**
01	Project is a good support to mobilise a'make in India' concept	**Welcome**
02	At full capacity, employment opportunities is projected to the tune of almost > 40, 000 persons and indirect employment as 5,00,000,	**Welcome**
03	It is a proud of Gujarat that this expansion project is being set up at Gujarat.	**Welcome**

04	On front paqe. environment consultant has submitteddítation status, as certificate no. NABET/ EIA/1013 /31, but ,it seems that it is validitv date intentionally not mentioned, thouqh it is there .infact, referring EIA , chapter 11, page 232, annexure 11.1, the validity period is mentioned as September 30, 2013, almost > 24 months over. It is very much surprising, that if referred Govt. of India enterprise environment consultant IS STILL CLAIMS AS ACREDITED CONSULTANT, then, it misleads the ToR (xii) mandatory 'undertaking', pi. refer to chapter 1 page 10, with yellow icon. & pi. refer to web page 5 (EIA serially page no. not available!!!) It also misleads mandatory ToR xi compliance , pi. refer web page 15 (EIA serially page no. not available !!!), on this page validity period is mentioned as 07 February 2017. There may be any good reasoning to explain, on paper, may be logical, philosophical, hypothetical, BUT THE FACT IS THAT, the certificate no. as referred on front page is misleading, violated 'undertaking. (desired pages downloaded from report, are reproduced herewith) If the front page it self is misleading one, then how one can rely on other data, extracted short falls from report itself as referred on subsequent query, will justify this. We very humbly request all regulatory authorities like MoEF / QCI / CHAIRMAN-MS-GPCB, Chairperson, dist. Environment public hearing, and other respective EC committee & members, keeping in mind the regulatory compliance being a prime focus, withoutany bias approach to any individual, may be a proponent, may be a consultant, to view this issue seriously for an appropriate action as applicable.	Since the original certificate was issued to MECON, no further renewal certificate has been issued to MECON. NABET has issued a letter to MECON stating that their accreditation has been renewed up to 07 Feb., 2017. MoEFCC regularly issues a list of Accredited Consultants on their website. In the latest such list, MECON is listed as a Fully Accredited Consultant(NOT PROVISIONAL) for several sectors, including"ALL SHIP BREAKING YARDS INCLUDING SHIP BREAKING UNITS". This dispels any doubts regarding MECON's credentials.
05	This undertaking is not in order, as there are many misleading informations- as reported herewith.	The undertakings furnished are in line with MoEFCC's requirements.

06	Declaration is in order, duly stamped and signed, BUT consultant has failed to submit a valid official letter from QCI-NABET for 'FAE' to support base line studies period, is not submitted. Consultant's 13 pages high profile as mentioned on Chapter, 11, page 225 to 237 does not support this. Even page 234, 235 does not support this, as this is almost 2 years old letter and does not justify status of base line studies period, and merely not justifying ' eligibility on EIA preparation'.	Refer reply to point no.4 above.
07	ToR xi- Remarks are misleading, There is no document as valid accreditation CERTIFICATE as mentioned validity period up to 7 February 2017, proceeding correspondence and progress letter-reminder sent by QCI-NABET can not be considered as a mandatory document, justifying ACCREDITATION CERTIFICATE. MANDATORY ToR COMPLIANCE IS MISLEADING ONE. ToRxM Front page ACCRETATION CERTIFICATE NUMBER IS MISLEADING-THERE IS NO SUCH DOCCUMENT TO JUSTIFY THIS 'QUOTE' ToR COMPLIANCE IS MISLEADING ONE.	Refer reply to point no. 4 above
08	comments	
09	PI. provide date of photographs - to support base line studies period to the possible extent.- as applicable.	Most photographs of Alang were taken by MECON's engineers during their site visit during April, 2015. A few photos, (4.d, 4.h & 7.b) were taken from the collection of photos available with GMB.
10	Query resolved	
11	ToR general guide lines (with yellow icon) (ii)-all the pages ARE NOT serially numbered- i.e right from front page up to chapter 1, and after chapter 11, uptoend page (needless to mention, other consultant's EIA; reports has complied this set norms- so it this not difficult task to mention) iii) period / date of data collection, is not at all available on respective tables for each baseline period sample monitoring. Such queries are already raised on subsequent EIA page numbers, (xi) ACCREDITATION CERTIFICATE part already discussed. Mandatory ToR COMPLIANCE IS NOT IN ORDER	The first page of the report proper (1st page of Chapter 1) is numbered "1". Subsequent pages have been numbered serially, except title pages of Chapters. The dates of sample collection, which were not mentioned in the EIA Report, have already been furnished earlier.

12	ToR (xii) Already discussed ToR COMPLIANCE IS NOT IN ORDER.	The No. of the Accreditation Certificate Issued to MECON has been indicated. Declarations from MECON as well as GMB, in line with MoEFCC's requirements have been included.
13	We are happy to learn from draft REIA report that you have made it very clear that Alang Sosia SRY is not equipped with recycling of submarines and nuclear powered ships, appreciated, PI. provide information that how it will be informed to down the level senior staff as well	All nuclear powered ships are under very strict control of the respective governments throughout their entire life cycles. Decommissioned nuclear powered ships are sent for recycling only to centres under total control of the concerned government. Such ships are NEVER sold off to private entreprenuers. Because of their cylindrical shapes submarines have to be supported from the sides to keep them upright when out of the water. Since this is not feasible at Alang, no ship-breaker purchases submarines.
14	Wind rose diagram. Information provided just on 'wind speed' is not adequate, PI. provide some more details on 1- start period and start hr. 2- end period and end hr. 03-total hrs. 04-total calm hrs. (just,mentioning as 'summer season 2015', does not sound true details), It seems that other consultant's EIA reports are not viewed by consultant to provide desired information for a better clarity. PI provide information on whether this studies were carried out by principal consultant OR by his sub contractual accredited consultant and who 'FAE' has carried out this study.	Wind rose diagrams are deigned not only to indicate, wind speeds but also distribution patterns (in % of time) of various wand speed ranges from various directions. The % of time during which "Calm" conditions prevailed, are also indicated. The Wind Rose diagrams given in the EIA report give all this information. In addition, the actual percentages have been given in Table 3.2 of the EIA Report. The baseline environmental data generation work was subcontracted out. The work was carried out under the supervision of MECON's FAEs (Suvamoy Adak & Dr. Bipul Kumar).

15	In which 'approved lab', with it's contact details and valid approval status, all base line studies period samples were analysed, and during what actual period? PI. Provide the copy of scope of analytical parameters, on due approval given by MoEF / NABL as the case may be. PI. Refer to, Table 3.8 + on AAQ monitoring Table 3.13.1 +forSW Table 3.15 + for GW Table 3.16 for effluent analysis Table 3.18 for noise Table 3.21 for soil	MECON has a system for empanelling accredited laboratories for baseline data generation, which has been critically reviewed comprehensively by NABET and approved. The contract between MECON and the subcontracted laboratory is a confidential document. It may be noted that MECON is a Govt. of India undertaking with impeccable reputation. Data generated by MECON is accepted without any doubts about their veracity by various statutory authorities including CPCB and MoEFCC.
16	01—Terrestrial ecology PI. provide information on what was the source and year of data OR who FAE has visualized all these data personally, 01—during what period, 02—with who villager presence, pi. quote the name if possible. 03—pi. provide a digital date photograph to support this if available. PI. refer to 77 to 86 Table 3.25 + all as applicable 87 to 90 02—Marine ecology PI. referv to Table 3.31 + 03—Heavy metals In which approved lab and during what period this sample was analysed PI. refer to, 90 Table 3.36 04—Traffic density measurement 91,92. PI. refer to, Table 3.38 94 05—Demographic pattern PI. refer to. Table 3	The information on terrestrial ecology was collected by actual field survey conducted by Shri Suvamoy Adak, accredited Ecology & Biodiversity FAE, of MECON. The data / information was augmented by earlier EIA reports and documents available with MECON and GMB. As regards Marine Ecology, the work was carried out by M/s Terracon Ecotech Pvt. Ltd. under the supervision of Mr. S.Adak of MECON. The heavy metal analysis were carried out at MECON's Environmental Engg. Laboratory. Traffic density measurement was carried out by M/s Mitra S.K. Pvt. Ltd. In accordance with the Format Provided by MECON. Demographic data has been taken from Census, 2011 Report.

17	Anticipated impacts PI provide MSDS for PCBs.	Noted. Will be included.
18	Is incinerator approved by CPCB or any other regulatory authority, PI. Provide such valid certificate. Will there be any possibility of emitting poisonous gases like dioxin /furan , if so, pi. Provide details with it's daily quantum and it's mitigation measures to safeguard environment from it's negative adverse impact on environment.	The incinerator is part of Alang waste Treatment Storage and Disposal Facility (TSDF). The TSDF also includes an ETP and landfills. The TDF has received Environmental Clearance from MoEFCC and other necessary clearances from GPCB also. The incinerator is a high temperature dual chamber incinerator. Wastes are fed into Primary Chamber preheated to ~750° C, which prevents the formation of dioxins / furans. From the Primary Chamber,the combustion gases are led to the Secondary Chamber and further burnt at ~1100° C, which ensures complete combustion.
19	To treat daily 30 m3 effluent, in ETP, what is your design capacity	The ETP has been designed to treat 30 m3/day of effluents.
20	ETP 01-With reference to 30 m3 effluent inlet, pi. provide the qty. in diagram at each stage. 02—What will be daily treated effluent qty out put and what will be mode of disposal, do you have a written permission from GPCB for it's disposal and where to dispose off. 03—How much daily treated water will be reused. 04—PI provide treated effluent specification and whether, every time it will comply set norms of GPCB., and IF NOT, then, what will be your firm measures	Quantities will be provided. As mentioned earlier, the ETP is a part of Alang TSDF which has all necessary clearances from MoEFCC and GPCB. Efforts will be made to use the entire quantity of treated effluent for dust suppression in the SRY. The effluents will conform to the norms specified in "General Standards for Discharge of Pollutants to Marine Coastal Waters" specified by MoEFCC. The effluents will be treated so that the norms are ALWAYS met. The TSDF has a Quality Control laboratory to ensure the same.
21	What will be the expiry period of referred landfill site? Is this site is an approved one	The landfills sites are sufficient to meet the requirements for Alang SRY working at full capacity for at least 15 years more. The site has been approved in the Env. Clearance.

22	We appreciate isopleths of PM 10, SO2, NOX, is provided, Pl. provide the isopleths for 'CO' also.	As has been mentioned earlier, the incinerator has been designed to ensure complete combustion (i.e. no CO generation. It may please be noted that CO is lighter than air and emitted CO will keep on rising.
23	Green belt Details are not adequate, Ref. to EIA page 18, the total plot area as projected is as 398803 ha. Pl. provide some more vital information on, 01—so far how many trees already planted? (pi. also provide some supporting document to justify this) 02—how many trees will be planted now onwards (waiting for 'EC not required for this noble cause) 03—what was survival rate for trees already planted? 04—what will be survival rate for trees proposed to be planted? 05—what area in m2 already covered for trSees already painted? 06—any tree plantation already carried out, out side of project area premises, if so, pi. provide details. 07—for such a massive tree plantation, have you included a cost of required TREE GUARDS in a environmental capital budget, if so, pi. provide details.	This reply of the same will be sent later separately after gathering information from different sources
24	People's perception- Pl. provide some more information on, whether any stake holders, NGO, Govt employee, were consulted, if so, pi. provide details with period, location/s & a copy of MoM	A sample survey was conducted only amongst local villagers regarding their opinion about the project.
25	CSR activities for FY 2015-16 01—It is very less & hardly budgeted for 24 lakhs only, pi. Budget for some more amount. 02—Why no budget for celebration of environmental days and health hygiene days.	Noted and will share the information later.
26	Disclosure of consultant Where is QCI extension letter no. NABET / EIA / RA022 / 047 dated 7 Feb. 14 Oct 2014, pi. provide the same. Annexure 11.1 is not the desired document!!! INFORMATION IS MISLEADING ONE	Refer to reply against Point No.4 above.

27	QCI CERTIFICATE 031, AND SCOPE OF ACREDITATIONVALIDITY 2013, What is a value addition of this old dated letter as validity is already expired in September 2013, it is all to divert, PUBLIC ATTN. INFORMATION IS MISLEADING ONE	Refer to reply against Point No. 4 above.
28	QCI LETER 14 OCTOBER 2014, What is the value addition of this one year old letter, AS THIS IS NOT THE ACCREDITATION CERTIFICATE, ONE YEAR ALREADY OVER, PL CONFIRM WHETHER ALL DUES ARE PAID, ALL NECESSARY ACTIONS TO CLOSE ALL Ncs / Obs / Alerts ARE TAKEN AND RESOLVED ALL THAT, THEN WHY QCI-NABET HAS NOT ISSUED ACCREDITATION CERTIFICATE? AT LEAST HAVE THEY ISSUED AN OFFICIAL LETTER THAT YOU ARE EIGIBLE TO PREPARE EIA REPORT, PROPR TO COMMNENCING BASE LINE STUDIES PERIOSD, i.e. PRIOR TO MARCH 15 (AS PER EIA PAGE 44), IF YES, PL. PROVIDE SUCH DOCUMENT BEFORE COMMENCEMENT OF START HRS OF ENVIRONMENT OUBLIC HEARING, SCHEDULE ON 20 OCTOBER 15, OTHERWISE AS PER SET NORMS, CONSULTANT WAS NOT ELIGIBLE TO START BASE LINE STUDIES AND PREPARE EIA REPORT-this ca be considered a serious non conformance of set norms and submitting a MIS- LEADING 'UNDERTAKING' & MISLEADING 'DECLARATION'	Refer to reply against Point No. 4 above.
29	<u>NABL CERTIFICATE</u> It's validity is OK, but it is subject to some T&C. PL. confirm, post issue date, i.e. 18/09/14, whether any annual surveillance was carried out, if so, when and whether final report was satisfactory to CONTINUE NABL ACCREDITATION to make you eligible to carry out analysis of various base line studies samples. It's validity is expired on 17/09/16, pi. confirm, whether a proactive action initiiated for it's renewal, if so, pi. provide the copy of same. Are all the Base line studies samples tested al the way at KOLKATA, or at any other near place in Gujarat to econo9mise the testing cost, if so, pi. provide contact details of that particular lab/s with it's valid accreditation certificate justifying that particular address in it.	MECON has a system in place to ensure that the accreditation of empanelled laboratories are valid. The tenders issued for baseline data generation to empaneled laboratories includes a clause that the bidder must have a valid accreditation and a copy of the accreditation certificate has to be submitted with the bid documents.
30	PI. provide NABET-QCI as on date approved list for scope of accreditation-FAE.	Refer to reply to Point No.4 above.

31	What is the projected capital cost, What will be the payback period ?	Approx. 1638 Crores
32	What will be minimum qty of reserve fire water, that will be kept ready at any given point of time?	Approx. 3.5 lakh litre
33	How far is the nearest 'public transport' from main entry gate of project site?	Approx. 1 km
34	(a) How many assembly points you will have at project site? (b) PI. provide evacuation path & evacuation procedure with plan lay out with north direction, specifying fire prone area , explosion prone areas and assembly point.	Each individual plot has its own specific assembly point.(s) and evacuation path(s)
35	(a) How long construction period will continue? (b) In case if it prolongs for more than 1 year, what will be your mitigation measures to take care of any likely negative adverse impacts as like 'habitat disturbances'. © What will be your provision to provide drinking water and sanitation facilities for your construction contract workers, (d) At what minimum 'km' distance is a public transport from project site ? (e) How many construction workers will be employed during construction period?	The project will be completed as per the schedule. All details as asked have covered in EIA and EMP report
36	Do you have a provision for PERT-CPM chart to ensure timely execution of this multi-crore project?	This will be addressed in PMC contract once project activities are started..
37	PI. provide information on, has any part of work of draft REIA report preparation was entrusted to any of another consultant, by your retained environment consultant, if so, pi. provide his details and particularly, for which chapter studies, he was involved.	The EIA Report has been prepared by MECON only.
38	Has a set guide lines for proponent & that for consultant followed properly, pi. confirm	Yes, as per tender document, there are various phases for review of deliverables.

39	Though Gujarat Govt. can retain any better accredited consultant of their choice, as per their tender procedure, but, what was a special reason to assign this very important job of preparing EIA report to 'Dist. Jharkhand' based consultant, far away from Gujarat. 01— Is it that there is no equivalent, better and reliable accredited environment consultant in Gujarat OR 02—is it that cost saving was considerable, as he was more economical, Inclusive cost of analysis of all the sample with his accredited lab. all the way at kolkata OR 03— Govt. dept. has to assign such multicrore project only to Govt. enterprise environment consultant ?who may be also far away from Gujarat. 04— Before assigning this job to 'referred consultant' who authorized person of 'Gujarat marytime board' has checked and verified his ' QCI-NABET valid accredited CERTIFICATE (as annexure 11.1 is not the ACCREDITED CERTIFICATE.,and for a mandatory terms, any type of logical, philosophical, hypothetical answers to satisfy, IS NOT ACCEPTABLE, AS THERE ARE NO SUPPORTING DOCUMENTS, & IT DEVIATEDS THE MANDATORY 'DECLARATION.', THE FACT IS THAT THERE IS NO COPY OF SUCH VALID ACCREWillDITED CERTIFICATE &	It is necessary that a EIA Report be prepared by a consultant accredited by NABET/QCI for that particular sector. There is no law in the country which debars a company with HQ in State "A" from bidding for a project in State "B". MECON was awarded the contract on basis of credentials through an open tender.
40	PI. provide information on Risk assessment on likely 01—Natural disaster like tsunami 02—Man made Terrorist attach - bomb threat.	Alang is located in an area of low Seismic Activity
41	In case, If you will install a fire alarm system along with a power driven siren system, better to keep a provision of manual bells also at all fire prone areas.	The volume of sound from a bell is too low and may be lost with sounds associated with handling metal pieces on the plots. On the other hand a power driven sound is much louder and very much unlike other sounds / noises generated during routine activities at the yard.
42	In case if you owe your own in house, ambulance, pi ensure that your medical van / ambulance will have a certified medical oxygen filled in. in medicaloxygen cylinder and not just 'oxygen', and keep test report always readyinambulance for a periodical vigilant check..	Noted
43	PI. budget some amount to uplift the society weaker class persons of project affected area, like senior citizens, widows, rejected female from society,dumb& deaf, blind, orphans, handicapped one etc.	Noted

44	PI. refer to some case studies of last three FY, on major fire, took place at other units at other locations, examine the cause and mitigation measures of that and adopt an appropriate measures as a proactive action for this project also.	Detailed disaster management plan shall be formulated based on the specific activities of various component of project. This DMP will benefit from study of other similar incidents and will be incorporate safety measures.
45	PI. invite the participants of this environment public hearings, who has extended valuable in puts , when you commission the project, to witness your success.	Noted .
46	PI. donate generously to Gujarat 'beti bachao & kanya kelwani abhiyan', the unique awareness programme of Gujarat Govt, for sustaining female child.	Noted
47	PI. encourage timber free construction as applicable.	Noted
48	pi. involve senior citizens, retired technocrats, social workers , stake holders, in a CSR committee / activities to seek their opinion for their valuable inputs.	**Noted**
49	PI. provide, under a humanity ground, a full medical treatment for employee diagnosed for TB, and /or for any other infectious disease, and providefull treatment to their close family members who are residing with him.	**Noted**
50	PI. set up a female grievance resolving cell, as applicable, if yet not worked out.	Noted
51	PI. enlist some external EHS expert for a regular visits to your group unit in future, and also for your established unit/s, so you can remain at par for 'EHS[1] related issues.	Noted
52	PI. declare this unit as a gutkha / cigarette / tobacco FREE ZONE if yet not decided.	Noted
53	LOOKING TO THE CREDIBILITY OF ' GUJARAT GOVT AND IT'S PROJECT, ONLY A SMALL REQUEST, In case, in future, if you may have to establish a new upcoming project OR going for expansion programme, & you will have to submit a draft REIA report to GPCB, you may retain services of any accredited environment consultant, what we appeal to you, pi. carry out pre-examination and review studies of draft REIA report, eighther 'in house' by your own experts,ORby your oqn retained accredited consultant, OR hire the services of some external professional EHS expert OR expert EIA reviewer (names can be referred on GPCB web site, MoM of environment public hearings) so that ,many of the ToR non compliances, short falls, as reported, can be taken	Noted

	care to avoid undue queries in environment public hearings OR with 'EC committee, and you can submit a good quality draft REIA report to regulatory authorities, to justify your credibility and assuring an environmentally sustainable project in Gujarat. Hope , you will appreciate our positive feed back	

D-4

D

ગુજરાત મેરીટાઈમ બોર્ડ

ગુમેબો/પર્યા/૯૧/(સી)/જાઈકા/અલંગ કેમ્પ –૨ તારીખઃ ૨૦/૧૦/૨૦૧૫

પ્રતિ,
શ્રી રામુભાઈ ગોહિલ
સરપંચ – નવા ગામ (નાના)
તાલુકોઃ ઘોઘા
જીલ્લોઃ ભાવનગર

વિષયઃ અલંગ નોટીફીઈડ એરીયામાં આવતા ગામોનો પ્રશ્ન

શ્રીમાન,

જયભારત સાથ જણાવવાનું કે આપનો પ્રશ્ન અલંગ, સોસિયા અને મથાવડા જહાજ રીસાયકલિંગ યાર્ડના સલામત અને પર્યાવરણીય સુસંગત આધુનિકરણની સુચિત પરિયોજના માટેની પર્યાવરણીય લોકસુનાવણીની બહારનો છે અને મહેસુલ વિભાગને લગતો હોઈ સદરહુ પત્રની નકલ માનનીય કલેકટરશ્રીના સુચન મુજબ તેઓશ્રીને મોકલવામાં આવી રહયો છે.

આપનો વિશ્વાસુ,

નાયબ જનરલ મેનેજર (પર્યા)
ગુજરાત મેરીટાઈમ બોર્ડ
ગાંધીનગર

નકલ સાદર રવાનાઃ

પ્રાદેશિક અધિકારીશ્રી,
ગુજરાત પ્રદુષણ નિયંત્રણ બોર્ડ, ભાવનગર

હેડ ઓફિસ : સેક્ટર૧૦-એ, ''છ'' રોડ, એરફોર્સ સ્ટેશન સામે, ગાંધીનગર - ૩૮૨૦૧૦. ગુજરાત (ભારત)
ફોન : (૯૧-૦૭૯) ૨૩૨૩૮૩૪૬/૪૭/૪૮/૫૧, ફેક્સ : (૯૧-૦૭૯) ૨૩૨૩૪૭૦૪, ટેલીફેક્સ : ૦૭૯-૨૩૨૩૪૭૦૫,
E-mail : info@gmbports.in Website : www.gmbports.org

D-4

D - 4

GUJARAT MARITIME BOARD

GMB/Env/91(C)/JICA/ Camp Alang -2 Date : 20/10/2015

To,
Shri Ramubhai Gohil
Sarpanch -Village Nava Gam
Taluka: Ghogha
Dist: Bhavnagar

Sub: Questions of villages falling in Alang Notified Area

Sir,

Question is related to land revenue jantri and its rates and hence it is outside the purview of Environmental Public Hearing. Therefore, as per instruction of the Collector, Bhavnagar, the letter is being sent to the Collector, Bhavnagar.

Yours faithfully,

Dy. General Manager (Env)
Gujarat Maritime Board
Gandhinagar

Copy submitted to:

The Regional Officer
Gujarat Pollution Control Board, Bhavnagar

Head Office : Sector - 10/A, "Chh" Road, Opp. Air Force Station, Gandhinagar - 382010. Gujarat (INDIA)
Phone : (91-079) 23238346-47-48-51 Fax : (91-079) 23234704 Telefax : 079-23234705
E-mail : gmbad1@sancharnet.in Website : www.gmbports.org

D-5

D - 5

ગુજરાત મેરીટાઈમ બોર્ડ

ગુમેબો/પર્યા/૯૧/(સી)/જાઈકા/અલંગ કેમ્પ –૩ તારીખ: ૨૦/૧૦/૨૦૧૫

પ્રતિ,
શ્રી લી. જી. મકવાણા
સરપંચ – ગામ : ગરીબપુરા
ભાંખલ જુથ
તાલુકો: ઘોઘા
જીલ્લો: ભાવનગર

વિષય: અલંગ નોટીફીઈડ એરીયામાં આવતા ગામોનો પ્રશ્ન

શ્રીમાન,

જયભારત સાથ જણાવવાનું કે આપનો પ્રશ્ન અલંગ, સોસિયા અને મથાવડા જહાજ રીસાયકલિંગ યાર્ડના સલામત અને પર્યાવરણીય સુસંગત આધુનિકરણની સુચિત પરિયોજના માટેની પર્યાવરણીય લોકસુનાવણીની બહારનો છે અને મહેસુલ વિભાગને લગતો હોઈ સદરહુ પ્રશ્ન માનનીય કલેકટરશ્રીના સુચન મુજબ તેઓશ્રીને મોકલવામાં આવી રહયો છે.

આપનો વિશ્વાસુ,

નાયબ જનરલ મેનેજર (પર્યા)
ગુજરાત મેરીટાઈમ બોર્ડ
ગાંધીનગર

નકલ સાદર રવાના:

પ્રાદેશિક અધિકારીશ્રી,
ગુજરાત પ્રદુષણ નિયંત્રણ બોર્ડ, ભાવનગર

હેડ ઓફિસ : સેક્ટર૧૦-એ, ''છ'' રોડ, એરફોર્સ સ્ટેશન સામે, ગાંધીનગર - ૩૮૨૦૧૦. ગુજરાત (ભારત)
ફોન : (૯૧-૦૭૯) ૨૩૨૩૮૩૪૬/૪૭/૪૮/૫૧, ફેક્સ : (૯૧-૦૭૯) ૨૩૨૩૪૭૦૪, ટેલીફેક્સ : ૦૭૯-૨૩૨૩૪૭૦૫,
E-mail : info@gmbports.in Website : www.gmbports.org

D-5

D-5

D-5

GUJARAT MARITIME BOARD

GMB/Env/91(C)/JICA/ Camp Alang -3 Date : 20/10/2015

To,
Shri L G Makwana
Sarpanch Village Garibpura
Bhakhal Group
Taluka: Ghogha
Dist: Bhavnagar

Sub: Questions of villages falling in Alang Notified Area

Sir,

Question is related to land revenue jantri and its rates and hence it is outside the purview of Environmental Public Hearing. Therefore, as per instruction of the Collector, Bhavnagar, the letter is being sent to the Collector, Bhavnagar.

Yours faithfully,

Dy. General Manager (Env)
Gujarat Maritime Board
Gandhinagar

Copy submitted to:

The Regional Officer
Gujarat Pollution Control Board, Bhavnagar

Head Office : Sector - 10/A, "Chh" Road, Opp. Air Force Station, Gandhinagar - 382010. Gujarat (INDIA)
Phone : (91-079) 23238346-47-48-51 Fax : (91-079) 23234704 Telefax : 079-23234705
E-mail : gmbad1@sancharnet.in Website : www.gmbports.org

D-6

D-6
D-6

ગુજરાત મેરીટાઈમ બોર્ડ

ગુમેબો/પર્યા/૯૧/(સી)/જાઈકા/અલંગ કેમ્પ – ૪ તારીખ: ૨૦/૧૦/૨૦૧૫

પ્રતિ,
શ્રી એ. ઘી. રાવ
સરપંચ ગામ : ચણીયાળા
તાલુકો: ઘોઘા
જીલ્લો: ભાવનગર

વિષય: અલંગ નોટીફીઈડ એરીયામાં આવતા ગામોનો પ્રશ્ન

શ્રીમાન,

જયભારત સાથ જણાવવાનું કે આપનો પ્રશ્ન અલંગ, સોસિયા અને મથાવડા જહાજ રીસાયકલિંગ યાર્ડના સલામત અને પર્યાવરણીય સુસંગત આધુનિકરણની સુચિત પરિયોજના માટેની પર્યાવરણીય લોકસુનાવણીની બહારનો છે અને મહેસુલ વિભાગને લગતો હોઈ સદરહુ પ્રશ્ન માનનીય કલેકટરશ્રીના સુચન મુજબ તેઓશ્રીને મોકલવામાં આવી રહયો છે.

આપનો વિશ્વાસુ,

નાયબ જનરલ મેનેજર (પર્યા)
ગુજરાત મેરીટાઈમ બોર્ડ
ગાંધીનગર

નકલ સાદર રવાના:

પ્રાદેશિક અધિકારીશ્રી,
ગુજરાત પ્રદુષણ નિયંત્રણ બોર્ડ, ભાવનગર

હેડ ઓફિસ : સેક્ટર૧૦-એ, ''છ'' રોડ, એરફોર્સ સ્ટેશન સામે, ગાંધીનગર - ૩૮૨૦૧૦. ગુજરાત (ભારત)
ફોન : (૯૧-૦૭૯) ૨૩૨૩૮૩૪૬/૪૭/૪૮/૫૧, ફેક્સ : (૯૧-૦૭૯) ૨૩૨૩૪૭૦૪, ટેલીફેક્સ : ૦૭૯-૨૩૨૩૪૭૦૫,
E-mail : info@gmbports.in Website : www.gmbports.org

D-6

D - 6

GUJARAT MARITIME BOARD

GMB/Env/91(C)/JICA/ Camp Alang -4 Date : 20/10/2015

To,
Shri A G Rav
Sarpanch
Village Chaniyala
Taluka: Ghogha
Dist: Bhavnagar

Sub: Questions of villages falling in Alang Notified Area

Sir,

Question is related to land revenue jantri and its rates and hence it is outside the purview of Environmental Public Hearing. Therefore, as per instruction of the Collector, Bhavnagar, the letter is being sent to the Collector, Bhavnagar.

Yours faithfully,

Dy. General Manager (Env)
Gujarat Maritime Board
Gandhinagar

Copy submitted to:

The Regional Officer
Gujarat Pollution Control Board, Bhavnagar

Head Office : Sector - 10/A, "Chh" Road, Opp. Air Force Station, Gandhinagar - 382010. Gujarat (INDIA)
Phone : (91-079) 23238346-47-48-51 Fax : (91-079) 23234704 Telefax : 079-23234705
E-mail : gmbad1@sancharnet.in Website : www.gmbports.org

D-7

D-7

D-8

ગુજરાત મેરીટાઈમ બોર્ડ

ગુમેબો/પર્યા/૯૧/(સી)/જાઈકા/અલંગ કેમ્પ –૫ તારીખ: ૨૦/૧૦/૨૦૧૫

પ્રતિ,
સરપંચશ્રી
ગામ: ભાંખલ
તાલુકો: ઘોઘા
જીલ્લો: ભાવનગર

વિષય: અલંગ નોટીફીઈડ એરીયામાં આવતા ગામોનો પ્રશ્ન

શ્રીમાન,

જયભારત સાથ જણાવવાનું કે આપનો પ્રશ્ન અલંગ, સોસિયા અને મથાવડા જહાજ રીસાયકલિંગ યાર્ડના સલામત અને પર્યાવરણીય સુસંગત આધુનિકરણની સુચિત પરિયોજના માટેની પર્યાવરણીય લોકસુનાવણીની બહારનો છે અને મહેસુલ વિભાગને લગતો હોઈ સદરહુ પ્રશ્ન માનનીય કલેકટરશ્રીના સુચન મુજબ તેઓશ્રીને મોકલવામાં આવી રહયો છે.

આપનો વિશ્વાસુ,

નાયબ જનરલ મેનેજર (પર્યા)
ગુજરાત મેરીટાઈમ બોર્ડ
ગાંધીનગર

નકલ સાદર રવાના:

પ્રાદેશિક અધિકારીશ્રી,
ગુજરાત પ્રદુષણ નિયંત્રણ બોર્ડ, ભાવનગર

D-7

D-7

GUJARAT MARITIME BOARD

GMB/Env/91(C)/JICA/ Camp Alang - 5 Date : 20/10/2015

To,

Sarpanch shri
Village Bhankhal
Taluka: Ghogha
Dist: Bhavnagar

Sub: Questions of villages falling in Alang Notified Area

Sir,

Question is related to land revenue jantri and its rates and hence it is outside the purview of Environmental Public Hearing. Therefore, as per instruction of the Collector, Bhavnagar, the letter is being sent to the Collector, Bhavnagar.

Yours faithfully,

Dy. General Manager (Env)
Gujarat Maritime Board
Gandhinagar

Copy submitted to:

The Regional Officer
Gujarat Pollution Control Board, Bhavnagar

Head Office : Sector - 10/A, "Chh" Road, Opp. Air Force Station, Gandhinagar - 382010. Gujarat (INDIA)
Phone : (91-079) 23238346-47-48-51 Fax : (91-079) 23234704 Telefax : 079-23234705
E-mail : gmbad1@sancharnet.in Website : www.gmbports.org

D-8

D-:
D-१

ગુજરાત મેરીટાઈમ બોર્ડ

ગુમેબો/પર્યા/૯૧/(સી)/જાઈકા/અલંગ કેમ્પ –૬ તારીખ: ૨૦/૧૦/૨૦૧૫

પ્રતિ,

સરપંચશ્રી, ગામ: ભાંખલ, તાલુકો: ઘોઘા, જીલ્લો: ભાવનગર

સરપંચશ્રી, ગામ: ગરીબપુરા, તાલુકો: ઘોઘા, જીલ્લો: ભાવનગર

સરપંચશ્રી, ગામ: ચનીયાળલ તાલુકો: ઘોઘા, જીલ્લો: ભાવનગર

સરપંચશ્રી, ગામ: નવા ગામ (નાના), તાલુકો: ઘોઘા, જીલ્લો: ભાવનગર

વિષય: અલંગ નોટીફીઈડ એરીયામાં આવતા ગામોનો પ્રશ્ન

શ્રીમાન,

જયભારત સાથ જણાવવાનું કે આપનો પ્રશ્ન અલંગ, સોસિયા અને મથાવડા જહાજ રીસાયકલિંગ યાર્ડના સલામત અને પર્યાવરણીય સુસંગત આધુનિકરણની સુચિત પરિયોજના માટેની પર્યાવરણીય લોકસુનાવણીની બહારનો છે અને મહેસુલ વિભાગને લગતો હોઈ સદરહુ પ્રશ્ન માનનીય કલેકટરશ્રીના સુચન મુજબ તેઓશ્રીને મોકલવામાં આવી રહયો છે.

આપનો વિશ્વાસુ,

નાયબ જનરલ મેનેજર (પર્યા)
ગુજરાત મેરીટાઈમ બોર્ડ
ગાંધીનગર

નકલ સાદર રવાના:

પ્રાદેશિક અધિકારીશ્રી,
ગુજરાત પ્રદુષણ નિયંત્રણ બોર્ડ, ભાવનગર

D-8

GUJARAT MARITIME BOARD

GMB/Env/91(C)/JICA/ Camp Alang -6 Date : 20/10/2015

To,

1. Sarpanch Shri, Village: Bhakhal, Taluka: Ghogha, Dist: Bhavnagar
2. Sarpanch Shri, Village: Garibpura, Bhakhal Group, Taluka: Ghogha, Dist: Bhavnagar
3. Sarpanch Shri, Village: Chaniyal, Taluka: Ghogha, Dist: Bhavnagar
4. Sarpanch Shri, Village: Nava Gam (Nana), Taluka: Ghogha, Dist: Bhavnagar

Sub: Questions of villages falling in Alang Notified Area

Sir,

Question is related to land revenue jantri and its rates and hence it is outside the purview of Environmental Public Hearing. Therefore, as per instruction of the Collector, Bhavnagar, the letter is being sent to the Collector, Bhavnagar.

Yours faithfully,

Dy. General Manager (Env)
Gujarat Maritime Board
Gandhinagar

Copy submitted to:

The Regional Officer
Gujarat Pollution Control Board, Bhavnagar

Head Office : Sector - 10/A, "Chh" Road, Opp. Air Force Station, Gandhinagar - 382010. Gujarat (INDIA)
Phone : (91-079) 23238346-47-48-51 Fax : (91-079) 23234704 Telefax : 079-23234705
E-mail : gmbad1@sancharnet.in Website : www.gmbports.org

D-9

D - 9

ગુજરાત મેરીટાઇમ બોર્ડ

ગુમેબો/પર્યા/૯૧/(સી)/જાઈકા/અલંગ કેમ્પ –૭ તારીખઃ ૨૦/૧૦/૨૦૧૫

પ્રતિ,
૧. શ્રી વનરાજસિંહ ધીરૂભા ગોહિલ
૨. શ્રી જટુભાઈ અજીતસિંહ ગોહિલ
૩. શ્રી અનીષસિંહ ગોહિલ
૪. શ્રી ડાભી હિંમતભાઈ કાળુભાઈ
૫. શ્રી ગોહિલ પ્રદિપસિંહ પ્રવિણસિંહ
૬. શ્રી ગોહિલ પ્રવિણસિંહ ધીરૂભા
૭. શ્રી રાઠોડ પ્રેમજીભાઈ ભવાનભાઈ
૮. શ્રી દિહોરા વિપુલભાઈ નાજાભાઈ
૯. શ્રી સોલંકી મીઠાભાઈ બેચરભાઈ
૧૦. શ્રી દિહોરા ભરતભાઈ દુલાભાઈ
૧૧. શ્રી ગોહિલ રાજદિપસિંહ પી.
૧૨. શ્રી ગોહિલ મહાવીરસિંહ ડી.
૧૩. શ્રી દિહોરા ગીલાભાઈ વાલાભાઈ

વિષયઃ ગુજરાત મેરીટાઈમ બોર્ડ દવારા રખાયેલ લોક સુનાવણીના વાંધાઓ બાબત તારીખઃ ૨૦/૧૦/૨૦૧૫

શ્રીમાન,

ઉપરોકત વિષય પરત્વેની આપની લેખિત રજુઆતના સંદર્ભમાં મુદદાસર જવાબ નીચે મુજબ છે.

૧. CRZ નોટીફીકેશન ૧૯૯૧માં આવેલ હતું. અલંગ શીપ રીસાયકલીગ યાર્ડનો વિકાસ અને વિસ્તરણ ૧૯૮૧થી તબકકાવાર જરૂર મુજબ થતો આવ્યો છે. સને ૧૯૯૧ પહેલા આ પ્રકારની પ્રવૃત્તિ માટે CRZ નું કલીઅરન્સ લેવાની જરૂર રહેતી ન હતી. અત્રે નોંધ લેવાની કે ગુજરાત મેરીટાઈમ બોર્ડ હંમેશા કાયદાઓનું પાલન કરે છે તેથી જ તેના બિલ્ડીગો જેવા કે સેફટી ટ્રેઈનીગ ઈન્સ્ટીટયુટ, એલપીજી ગોડાઉન વગેરેની CRZ નું કલીઅરન્સ લીધેલ છે. સુચિત પ્રોજકટમાં સમાવવામાં આવેલ તમામ ઘટકો માટે CRZ નું કલીઅરન્સ લેવામાં આવનાર છે.

હેડ ઓફિસ : સેક્ટર૧૦-એ, ''છ'' રોડ, એરફોર્સ સ્ટેશન સામે, ગાંધીનગર - ૩૮૨૦૧૦. ગુજરાત (ભારત)
ફોન : (૯૧-૦૭૯) ૨૩૨૩૮૩૪૬/૪૭/૪૮/૫૧, ફેક્સ : (૯૧-૦૭૯) ૨૩૨૩૪૭૦૪, ટેલીફેક્સ : ૦૭૯-૨૩૨૩૪૭૦૫,
E-mail : info@gmbports.in Website : www.gmbports.org

૨. આ નવો પ્રોજકટ નથી. માનનીય સુપ્રિમ કોર્ટના ઓર્ડરમાં નવા શીપ બ્રેકીંગ યાર્ડ માટે સુપ્રિમ કોર્ટની મંજુરી લેવી પડે તેવો કોઈ ઉલ્લેખ નથી. માનનીય સુપ્રિમ કોર્ટના ઓર્ડર પ્રમાણે ભારત સરકારે જે રાષ્ટ્રીય કોડ બનાવેલ છે, તેના પેરા નં. ૬.૪ના ક્રમાંક ૯ પ્રમાણે નવા યાર્ડના વિકાસ માટે ઈઆઈએ નોટીફીકેશન ૨૦૦૬ ના પારા નં. ૭(ડી) પ્રમાણે પર્યાવરણની મંજુરી લેવાની રહે છે. હાલના પ્રોજકટમાં નવા પ્લોટના વિકાસ માટે ઉપરોકત જોગવાઈ મુજબ પરવાનગી મેળવવામાં આવી રહી છે.

૩. આ પ્રકારની કોઈ પણ માહિતિ રીપોર્ટમાં દર્શાવેલ નથી. તેમ છતાં સુચિત કામદાર વસાહત માટે સુએજ ટ્રીટમેન્ટ પ્લાન્ટ મુકવામાં આવશે.

૪. ડ્રાયડોક કે જેનું સ્થાન દરિયામાં છે તે જગ્યાઓ પર કોઈ મેન્ગ્રુવ અથવા અન્ય વનસ્પતિઓ આવેલ નથી.

૫. હયાત પ્લોટ માટે જે જુની પોલીસી રીન્યુ થઈ રહી છે તે જ પોલીસી નવા પ્લોટો માટે લાગુ પડશે.

૬. ડ્રાયડોકમાં માત્ર લુઝ ઝેરી પદાર્થો જેવા કે સ્લજ, ઈન્સ્યુલેટીગ પદાર્થો કે જેની જહાજ ચલાવવા માટે જરૂર નથી તેનો જ નિકાલ કરવામાં આવશે. ડ્રાયડોક એ બંધ માળખુ છે જેમાં પાણી ન જાય તેવા બંધ દરવાજા છે અને જહાજને ડ્રાયડોકમાં સમાંતર મુકવામાં આવશે. બંકરના બળતણને બહાર કાઢવામાં નહી આવે. આમ એકવાર આ પ્રકારના લુઝ અને ઈન્સ્યુલેટીગ પદાર્થો કે જેની એન્જીન અને પ્રોપેલર ચલાવાવા માટે જરૂર નથી તેને ડ્રાયડોકમાં દુર કર્યા બાદ પાણીને ડ્રાયડોકમાં ૧૧.૫ મીટર સુધી અંદર આવવા દેવામાં આવશે જેથી જહાજ આપમેળે તરવા લાગશે અને દરવાજા ખોલી નાખવામાં આવશે. ઓટ દરમ્યાન પાવરફુલ ટગની મદદથી જહાજને ડ્રાયડોકમાંથી બહાર લાવી અન્ય નજીકના પ્લોટમાં બીચ કરવામાં આવશે.

૭. હાલમાં એક મીલીયન લીટર/દિનનો પાણી પુરવઠો દરેક પ્રકારના કામ માટે પુરતો છે. તેમ છતાં જો પાણીની વધારે જરૂરીયાત રહેશે તો ગુજરાત મેરીટાઈમ બોર્ડ દવારા ગુજરાત પાણી પુરવઠા નિગમ પાસેથી યોગ્ય વ્યવસ્થા કરવામાં આવશે.

આપનો વિશ્વાસુ,

નાયબ જનરલ મેનેજર (પર્યા)
ગુજરાત મેરીટાઈમ બોર્ડ
ગાંધીનગર

નકલ સાદર રવાના:

પ્રાદેશિક અધિકારીશ્રી,
ગુજરાત પ્રદુષણ નિયંત્રણ બોર્ડ, ભાવનગર

D-9

D-9

GUJARAT MARITIME BOARD

GMB/Env/91(C)/JICA/ Camp Alang - 7 Date : 20/10/2015

To,

1. Shri Vanrajsinh Dhirubha Gohil
2. Shri Jatubhai Ajitsinh Gohil
3. Shri Anopsinh N Gohil
4. Shri Himmatbhai Kalubhai Dabhi
5. Shri Pradipsinh Pravinsinh Gohil
6. Shri Pravinsinh Dhirubha Gohil
7. Shri Premjibhai Bhavanbhai Rathod
8. Shri Vipulbhai Najabhai Dihora
9. Shri Mithabhai Becharbhai Solanki
10. Shri Bharatbhai Dulabhai Dihora
11. Shri Rajdeepsinh P. Gohil
12. Shri Mahavirsinh D. Gohil
13. Shri Gilabhai Valabhai Dihora

Sub: **Objections regarding Public Hearing conducted by Gujarat Maritime Board on 20/10/2015**

Sir,

With respect to the written presentation on the subject mentioned above, poinwise answers are as follows:

1. CRZ Notification was enacted in 1991. It may be noted that Alang Ship Recycling Yard had come up in 1982 and gradually expanded as when plots are developed. Prior to 1991, such activities were not required to obtain CRZ Clearance. It may be noted that, GMB always follows rules & regulations. Hence GMB obtained CRZ Clearances for Safety Training Institute, LPG Storage Godowns in the plots and other common infrastructure required for labor housing colony. Project components requiring to provide to fullfill current upgradation process, are under the list of project activities in EIA for obtaining CRZ Clearance.

2. This project is not new project. There is no provision in any order of Hon"ble SC that for development of new plot, such permission of the Court is required. After issuance of direction of Hon'ble SC in 657/95 in 6th September -2007, as per one of the directions, Government of India has enacted a National Code for Ship Breaking 2013. As per provision of Sr No ix of Para No 6.4 of National Ship Breaking Code-2013, any new yard for ship breaking and as per Entry No 7(d) of EIA

Head Office : Sector - 10/A, "Chh" Road, Opp. Air Force Station, Gandhinagar - 382010. Gujarat (INDIA)
Phone : (91-079) 23238346-47-48-51 Fax : (91-079) 23234704 Telefax : 079-23234705
E-mail : gmbad1@sancharnet.in Website : www.gmbports.org

Notification-2006, current process of upgradation and development of new plots are being regulated.

3. There is no such information available in report. However, in proposed building for labor housing colony, Sewage Treatment Plant will be provided.
4. There are no mangroves or any other vegetation in dry dock sites which are located off-shore.
5. For existing plots, old policy is being enacted as new policy shortly as far as allotment and local governance is concerned and same policy will be applied to these 15 plots.
6. In dry dock, only loose hazardous materials like sludge in cargo hold tanks, insulating materials which are not required for voyage are removed in dry dock once water are drained from dry dock. Dry dock is a closed built up structure operated in water tight gates and vessels are laid in rails. Bunker fuels are not taken out. So once all such loose materials and insulating materials which are not required for running engines and propeller are removed. After decontamination of all these materials in dry dock, water are allowed through inlets and gates and full water is filled up in 11.5 m high dry dock, the decontaminated vessel is floated automatically and gates are made opened. With the help of power full tugs, flood water filled up in dry dock when flowing in ebb tide, vessel will be brought out from dry dock and in next tide same will be beached in any neighbouring plots.
7. At present, 1 MLD water supply seems adequate for all the usages. However further water requirement will have to be arranged by GMB from Gujarat Water Supply Board.

Yours faithfully,

Deputy General Manager (Env)
Gujarat Maritime Board
Gandhinagar

Copy submitted to:

The Regional Officer
Gujarat Pollution Control Board, Bhavnagar

D-10

D - 10

ગુજરાત મેરીટાઈમ બોર્ડ

ગુમેબો/પર્યા/૯૧/(સી)/જાઈકા/અલંગ કેમ્પ –૮ તારીખઃ ૨૦/૧૦/૨૦૧૫

પ્રતિ,
૧. શ્રી વનરાજસિંહ ઘીરૂભા ગોહિલ
૨. શ્રી ડાભી હિંમતભાઈ કાળુભાઈ
૩. શ્રી જટુભાઈ અજીતસિંહ ગોહિલ
૪. શ્રી ગોહિલ પ્રદિપસિંહ પ્રવિણસિંહ
૫. શ્રી રાઠોડ પ્રેમજીભાઈ ભવાનભાઈ
૬. શ્રી સોલંકી મીઠાભાઈ બેચરભાઈ
૭. શ્રી દિહોરા વિપુલભાઈ નાજાભાઈ
૮. શ્રી ગોહિલ રાજદિપસિંહ પી.
૯. શ્રી ગોહિલ મહાવીરસિંહ ડી.
૧૦. શ્રી દિહોરા ગીલાભાઈ વાલાભાઈ
૧૧. શ્રી દિહોરા ભરતભાઈ દુલાભાઈ

વિષયઃ ગુજરાત મેરીટાઈમ બોર્ડ દવારા રખાયેલ લોક સુનાવણીના વાંધાઓ બાબત તારીખઃ ૨૦/૧૦/૨૦૧૫

શ્રીમાન,

ઉપરોકત વિષય પરત્વેની આપની લેખિત રજુઆતના સંદર્ભમાં મુદદાસર જવાબ નીચે મુજબ છે.

૧. CRZ નોટીફીકેશન ૧૯૯૧માં આવેલ હતું. અલંગ શીપ રીસાયકલીગ યાર્ડનો વિકાસ અને વિસ્તરણ ૧૯૮૧થી તબકકાવાર જરૂર મુજબ થતો આવ્યો છે. સને ૧૯૯૧ પહેલા આ પ્રકારની પ્રવૃત્તિ માટે CRZ નું કલીઅરન્સ લેવાની જરૂર રહેતી ન હતી. અત્રે નોંધ લેવાની કે ગુજરાત મેરીટાઈમ બોર્ડ હંમેશા કાયદાઓનું પાલન કરે છે તેથી જ તેના બિલ્ડીગો જેવા કે સેફટી ટ્રેઈનીગ ઈન્સ્ટીટયુટ, એલપીજી ગોડાઉન વગેરેની CRZ નું કલીઅરન્સ લીધેલ છે. સુચિત પ્રોજકટમાં સમાવવામાં આવેલ તમામ ઘટકો માટે CRZ નું કલીઅરન્સ લેવામાં આવનાર છે.

હેડ ઓફિસ : સેક્ટર૧૦-એ, ''છ'' રોડ, એરફોર્સ સ્ટેશન સામે, ગાંધીનગર - ૩૮૨૦૧૦. ગુજરાત (ભારત)
ફોન : (૯૧-૦૭૯) ૨૩૨૩૮૩૪૬/૪૭/૪૮/૫૧, ફેક્સ : (૯૧-૦૭૯) ૨૩૨૩૪૭૦૪, ટેલીફેક્સ : ૦૭૯-૨૩૨૩૪૭૦૫,
E-mail : info@gmbports.in Website : www.gmbports.org

૨. આ નવો પ્રોજકટ નથી. માનનીય સુપ્રિમ કોર્ટના ઓર્ડરમાં નવા શીપ બ્રેકીંગ યાર્ડ માટે સુપ્રિમ કોર્ટની મંજુરી લેવી પડે તેવો કોઈ ઉલ્લેખ નથી. માનનીય સુપ્રિમ કોર્ટના ઓર્ડર પ્રમાણે ભારત સરકારે જે રાષ્ટ્રીય કોડ બનાવેલ છે, તેના પેરા નં. ૬.૪ના ક્રમાંક ૯ પ્રમાણે નવા યાર્ડના વિકાસ માટે ઈઆઈએ નોટીફીકેશન ૨૦૦૬ ના પારા નં. ૭(ડી) પ્રમાણે પર્યાવરણની મંજુરી લેવાની રહે છે. હાલના પ્રોજકટમાં નવા પ્લોટના વિકાસ માટે ઉપરોકત જોગવાઈ મુજબ પરવાનગી મેળવવામાં આવી રહી છે.

૩. આ પ્રકારની કોઈ પણ માહિતિ રીપોર્ટમાં દર્શાવેલ નથી. તેમ છતાં સુચિત કામદાર વસાહત માટે સુએજ ટ્રીટમેન્ટ પ્લાન્ટ મુકવામાં આવશે.

૪. ડ્રાયડોક કે જેનું સ્થાન દરિયામાં છે તે જગ્યાઓ પર કોઈ મેન્ગ્રુવ અથવા અન્ય વનસ્પતિઓ આવેલ નથી.

૫. હયાત પ્લોટ માટે જે જુની પોલીસી રીન્યુ થઈ રહી છે તે જ પોલીસી નવા પ્લોટો માટે લાગુ પડશે.

૬. ડ્રાયડોકમાં માત્ર લુઝ ઝેરી પદાર્થો જેવા કે સ્લજ, ઈન્સ્યુલેટીગ પદાર્થો કે જેની જહાજ ચલાવવા માટે જરૂર નથી તેનો જ નિકાલ કરવામાં આવશે. ડ્રાયડોક એ બંધ માળખુ છે જેમાં પાણી ન જાય તેવા બંધ દરવાજા છે અને જહાજને ડ્રાયડોકમાં સમાંતર મુકવામાં આવશે. બંકરના બળતણને બહાર કાઢવામાં નહી આવે. આમ એકવાર આ પ્રકારના લુઝ અને ઈન્સ્યુલેટીગ પદાર્થો કે જેની એન્જીન અને પ્રોપેલર ચલાવાવા માટે જરૂર નથી તેને ડ્રાયડોકમાં દુર કર્યા બાદ પાણીને ડ્રાયડોકમાં ૧૧.૫ મીટર સુધી અંદર આવવા દેવામાં આવશે જેથી જહાજ આપમેળે તરવા લાગશે અને દરવાજા ખોલી નાખવામાં આવશે. ઓટ દરમ્યાન પાવરફુલ ટગની મદદથી જહાજને ડ્રાયડોકમાંથી બહાર લાવી અન્ય નજીકના પ્લોટમાં બીચ કરવામાં આવશે.

૭. હાલમાં એક મીલીયન લીટર/દિનનો પાણી પુરવઠો દરેક પ્રકારના કામ માટે પુરતો છે. તેમ છતાં જો પાણીની વધારે જરૂરીયાત રહેશે તો ગુજરાત મેરીટાઈમ બોર્ડ દવારા ગુજરાત પાણી પુરવઠા નિગમ પાસેથી યોગ્ય વ્યવસ્થા કરવામાં આવશે.

આપનો વિશ્વાસુ,

નાયબ જનરલ મેનેજર (પર્યા)
ગુજરાત મેરીટાઈમ બોર્ડ
ગાંધીનગર

નકલ સાદર રવાના:

પ્રાદેશિક અધિકારીશ્રી,
ગુજરાત પ્રદુષણ નિયંત્રણ બોર્ડ, ભાવનગર

D-10

D - 1

GUJARAT MARITIME BOARD

GMB/Env/91(C)/JICA/ Camp Alang -8 Date : 20/10/2015

To,

1. Shri Vanrajsinh Dhirubha Gohil
2. Shri Himmatbhai Kalubhai Dabhi
3. Shri Jatubhai Ajitsinh Gohil
4. Shri Pradipsinh Pravinsinh Gohil
5. Shri Pravinsinh Dhirubha Gohil
6. Shri Mithabhai Becharbhai Solanki
7. Shri Vipulbhai Najabhai Dihora
8. Shri Rajdeepsinh P. Gohil
9. Shri Mahavirsinh D. Gohil
10. Shri Gilabhai Valabhai Dihora
11. Shri Bharatbhai Dulabhai Dihora

Sub: **Objections regarding Public Hearing conducted by Gujarat Maritime Board on 20/10/2015**

Sir,

With respect to the written presentation on the subject mentioned above, poinwise answers are as follows:

1. CRZ Notification was enacted in 1991. It may be noted that Alang Ship Recycling Yard had come up in 1982 and gradually expanded as when plots are developed. Prior to 1991, such activities were not required to obtain CRZ Clearance. It may be noted that, GMB always follows rules & regulations. Hence GMB obtained CRZ Clearances for Safety Training Institute, LPG Storage Godowns in the plots and other common infrastructure required for labor housing colony. Project components requiring to provide to fulfil current upgradation process, are under the list of project activities in EIA for obtaining CRZ Clearance.

2. This project is not new project. There is no provision in any order of Hon"ble SC that for development of new plot, such permission of the Court is required. After issuance of direction of Hon'ble SC in 657/95 in 6th September -2007, as per one of the directions, Government of India has enacted a National Code for Ship Breaking 2013. As per provision of Sr No ix of Para No 6.4 of National Ship Breaking Code-2013, any new yard for ship breaking and as per Entry No 7(d) of EIA Notification-2006, current process of upgradation and development of new plots are being regulated.

Head Office : Sector - 10/A, "Chh" Road, Opp. Air Force Station, Gandhinagar - 382010. Gujarat (INDIA)
Phone : (91-079) 23238346-47-48-51 Fax : (91-079) 23234704 Telefax : 079-23234705
E-mail : gmbad1@sancharnet.in Website : www.gmbports.org

3. There is no such information available in report. However, in proposed building for labor housing colony, Sewage Treatment Plant will be provided.
4. There are no mangroves or any other vegetation in dry dock sites which are located off-shore.
5. For existing plots, old policy is being enacted as new policy shortly as far as allotment and local governance is concerned and same policy will be applied to these 15 plots.
6. In dry dock, only loose hazardous materials like sludge in cargo hold tanks, insulating materials which are not required for voyage are removed in dry dock once water are drained from dry dock. Dry dock is a closed built up structure operated in water tight gates and vessels are laid in rails. Bunker fuels are not taken out. So once all such loose materials and insulating materials which are not required for running engines and propeller are removed. After decontamination of all these materials in dry dock, water are allowed through inlets and gates and full water is filled up in 11.5 m high dry dock, the decontaminated vessel is floated automatically and gates are made opened. With the help of power full tugs, flood water filled up in dry dock when flowing in ebb tide, vessel will be brought out from dry dock and in next tide same will be beached in any neighbouring plots.
7. At present, 1 MLD water supply seems adequate for all the usages. However further water requirement will have to be arranged by GMB from Gujarat Water Supply Board.

Yours faithfully,

Deputy General Manager (Env)
Gujarat Maritime Board
Gandhinagar

Copy submitted to:

The Regional Officer
Gujarat Pollution Control Board, Bhavnagar

D-11

D-11

ગુજરાત મેરીટાઈમ બોર્ડ

ગુમેબો/પર્યા/૯૧/(સી)/જાઈકા/અલંગ કેમ્પ – ૯ તારીખ: ૨૦/૧૦/૨૦૧૫

પ્રતિ,

૧. શ્રી અનીષસિંહ ગોહિલ
૨. શ્રી ગોહિલ પ્રદિપસિંહ પ્રવિણસિંહ
૩. શ્રી ડાભી હિંમતભાઈ કાળુભાઈ
૪. શ્રી વનરાજસિંહ ધીરૂભા ગોહિલ
૫. શ્રી જટુભાઈ અજીતસિંહ ગોહિલ
૬. શ્રી રાઠોડ પ્રેમજીભાઈ ભવાનભાઈ
૭. શ્રી દિહોરા વિપુલભાઈ નાજાભાઈ
૮. શ્રી સોલંકી મીઠાભાઈ બેચરભાઈ
૯. શ્રી ગોહિલ રાજદિપસિંહ પી.
૧૦. શ્રી ગોહિલ મહાવીરસિંહ ડી.
૧૧. શ્રી દિહોરા ગીલાભાઈ વાલાભાઈ
૧૨. શ્રી દિહોરા ભરતભાઈ દુલાભાઈ

વિષય: ગુજરાત મેરીટાઈમ બોર્ડ દવારા રખાયેલ લોક સુનાવણીના વાંધાઓ બાબત તારીખ: ૨૦/૧૦/૨૦૧૫

શ્રીમાન,

ઉપરોકત વિષય પરત્વેની આપની લેખિત રજુઆતના સંદર્ભમાં મુદદાસર જવાબ નીચે મુજબ છે.

૧. CRZ નોટીફીકેશન ૧૯૯૧માં આવેલ હતું. અલંગ શીપ રીસાયકલીગ યાર્ડનો વિકાસ અને વિસ્તરણ ૧૯૮૧થી તબકકાવાર જરૂર મુજબ થતો આવ્યો છે. સને ૧૯૯૧ પહેલા આ પ્રકારની પ્રવૃત્તિ માટે CRZ નું કલીઅરન્સ લેવાની જરૂર રહેતી ન હતી. અત્રે નોંધ લેવાની કે ગુજરાત મેરીટાઈમ બોર્ડ હંમેશા કાયદાઓનું પાલન કરે છે તેથી જ તેના બિલ્ડીગો જેવા કે સેફટી ટ્રેઈનીગ ઈન્સ્ટીટયુટ, એલપીજી ગોડાઉન વગેરેની CRZ નું કલીઅરન્સ લીધેલ છે. સુચિત પ્રોજકટમાં સમાવવામાં આવેલ તમામ ઘટકો માટે CRZ નું કલીઅરન્સ લેવામાં આવનાર છે.

હેડ ઓફિસ : સેક્ટર૧૦-એ, ''છ'' રોડ, એરફોર્સ સ્ટેશન સામે, ગાંધીનગર - ૩૮૨૦૧૦. ગુજરાત (ભારત)
ફોન : (૯૧-૦૭૯) ૨૩૨૩૮૩૪૬/૪૭/૪૮/૫૧, ફેક્સ : (૯૧-૦૭૯) ૨૩૨૩૪૭૦૪, ટેલીફેક્સ : ૦૭૯-૨૩૨૩૪૭૦૫,
E-mail : info@gmbports.in Website : www.gmbports.org

૨. આ નવો પ્રોજકટ નથી. માનનીય સુપ્રિમ કોર્ટના ઓર્ડરમાં નવા શીપ બ્રેકીંગ યાર્ડ માટે સુપ્રિમ કોર્ટની મંજુરી લેવી પડે તેવો કોઈ ઉલ્લેખ નથી. માનનીય સુપ્રિમ કોર્ટના ઓર્ડર પ્રમાણે ભારત સરકારે જે રાષ્ટ્રીય કોડ બનાવેલ છે, તેના પેરા નં. ૬.૪ના ક્રમાંક ૯ પ્રમાણે નવા યાર્ડના વિકાસ માટે ઈઆઈએ નોટીફીકેશન ૨૦૦૬ ના પારા નં. ૭(ડી) પ્રમાણે પર્યાવરણની મંજુરી લેવાની રહે છે. હાલના પ્રોજકટમાં નવા પ્લોટના વિકાસ માટે ઉપરોકત જોગવાઈ મુજબ પરવાનગી મેળવવામાં આવી રહી છે.

૩. આ પ્રકારની કોઈ પણ માહિતિ રીપોર્ટમાં દર્શાવેલ નથી. તેમ છતાં સુચિત કામદાર વસાહત માટે સુએજ ટ્રીટમેન્ટ પ્લાન્ટ મુકવામાં આવશે.

૪. ડ્રાયડોક કે જેનું સ્થાન દરિયામાં છે તે જગ્યાઓ પર કોઈ મેન્ગ્રુવ અથવા અન્ય વનસ્પતિઓ આવેલ નથી.

૫. હયાત પ્લોટ માટે જે જુની પોલીસી રીન્યુ થઈ રહી છે તે જ પોલીસી નવા પ્લોટો માટે લાગુ પડશે.

૬. ડ્રાયડોકમાં માત્ર લુઝ ઝેરી પદાર્થો જેવા કે સ્લજ, ઈન્સ્યુલેટીગ પદાર્થો કે જેની જહાજ ચલાવવા માટે જરૂર નથી તેનો જ નિકાલ કરવામાં આવશે. ડ્રાયડોક એ બંધ માળખુ છે જેમાં પાણી ન જાય તેવા બંધ દરવાજા છે અને જહાજને ડ્રાયડોકમાં સમાંતર મુકવામાં આવશે. બંકરના બળતણને બહાર કાઢવામાં નહી આવે. આમ એકવાર આ પ્રકારના લુઝ અને ઈન્સ્યુલેટીગ પદાર્થો કે જેની એન્જીન અને પ્રોપેલર ચલાવાવા માટે જરૂર નથી તેને ડ્રાયડોકમાં દુર કર્યા બાદ પાણીને ડ્રાયડોકમાં ૧૧.૫ મીટર સુધી અંદર આવવા દેવામાં આવશે જેથી જહાજ આપમેળે તરવા લાગશે અને દરવાજા ખોલી નાખવામાં આવશે. ઓટ દરમ્યાન પાવરફુલ ટગની મદદથી જહાજને ડ્રાયડોકમાંથી બહાર લાવી અન્ય નજીકના પ્લોટમાં બીચ કરવામાં આવશે.

૭. હાલમાં એક મીલીયન લીટર/દિનનો પાણી પુરવઠો દરેક પ્રકારના કામ માટે પુરતો છે. તેમ છતાં જો પાણીની વધારે જરૂરીયાત રહેશે તો ગુજરાત મેરીટાઈમ બોર્ડ દવારા ગુજરાત પાણી પુરવઠા નિગમ પાસેથી યોગ્ય વ્યવસ્થા કરવામાં આવશે.

આપનો વિશ્વાસુ,

નાયબ જનરલ મેનેજર (પર્યા)
ગુજરાત મેરીટાઈમ બોર્ડ
ગાંધીનગર

નકલ સાદર રવાના:

પ્રાદેશિક અધિકારીશ્રી,
ગુજરાત પ્રદુષણ નિયંત્રણ બોર્ડ, ભાવનગર

D-11

D-1

GUJARAT MARITIME BOARD

GMB/Env/91(C)/JICA/ Camp Alang - 9 Date : 20/10/2015

To,

1. Shri Anopsinh N Gohil
2. Shri Pradipsinh Pravinsinh Gohil
3. Shri Himmatbhai Kalubhai Dabhi
4. Shri Vanrajsinh Dhirubha Gohil
5. Shri Jatubhai Ajitsinh Gohil
6. Shri Premjibhai Bhavanbhai Rathod
7. Shri Vipulbhai Najabhai Dihora
8. Shri Mithabhai Becharbhai Solanki
9. Shri Rajdeepsinh P. Gohil
10. Shri Mahavirsinh D. Gohil
11. Shri Gilabhai Valabhai Dihora
12. Shri Bharatbhai Dulabhai Dihora

Sub: **Objections regarding Public Hearing conducted by Gujarat** Maritime Board on 20/10/2015

Sir,

With respect to the written presentation on the subject mentioned above, poinwise answers are as follows:

1. CRZ Notification was enacted in 1991. It may be noted that Alang Ship Recycling Yard had come up in 1982 and gradually expanded as when plots are developed. Prior to 1991, such activities were not required to obtain CRZ Clearance. It may be noted that, GMB always follows rules & regulations. Hence GMB obtained CRZ Clearances for Safety Training Institute, LPG Storage Godowns in the plots and other common infrastructure required for labor housing colony. Project components requiring to provide to fullfill current upgradation process, are under the list of project activities in EIA for obtaining CRZ Clearance.
2. This project is not new project. There is no provision in any order of Hon"ble SC that for development of new plot, such permission of the Court is required. After issuance of direction of Hon'ble SC in 657/95 in 6th September -2007, as per one of the directions, Government of India has enacted a National Code for Ship Breaking 2013. As per provision of Sr No ix of Para No 6.4 of National Ship Breaking Code-2013, any new yard for ship breaking and as per

Head Office : Sector - 10/A, "Chh" Road, Opp. Air Force Station, Gandhinagar - 382010. Gujarat (INDIA)
Phone : (91-079) 23238346-47-48-51 Fax : (91-079) 23234704 Telefax : 079-23234705
E-mail : gmbad1@sancharnet.in Website : www.gmbports.org

Entry No 7(d) of EIA Notification-2006, current process of upgradation and development of new plots are being regulated.

3. There is no such information available in report. However, in proposed building for labor housing colony, Sewage Treatment Plant will be provided.
4. There are no mangroves or any other vegetation in dry dock sites which are located off-shore.
5. For existing plots, old policy is being enacted as new policy shortly as far as allotment and local governance is concerned and same policy will be applied to these 15 plots.
6. In dry dock, only loose hazardous materials like sludge in cargo hold tanks, insulating materials which are not required for voyage are removed in dry dock once water are drained from dry dock. Dry dock is a closed built up structure operated in water tight gates and vessels are laid in rails. Bunker fuels are not taken out. So once all such loose materials and insulating materials which are not required for running engines and propeller are removed. After decontamination of all these materials in dry dock, water are allowed through inlets and gates and full water is filled up in 11.5 m high dry dock, the decontaminated vessel is floated automatically and gates are made opened. With the help of power full tugs, flood water filled up in dry dock when flowing in ebb tide, vessel will be brought out from dry dock and in next tide same will be beached in any neighbouring plots.
7. At present, 1 MLD water supply seems adequate for all the usages. However further water requirement will have to be arranged by GMB from Gujarat Water Supply Board.

Yours faithfully,

Deputy General Manager (Env)
Gujarat Maritime Board
Gandhinagar

Copy submitted to:

The Regional Officer
Gujarat Pollution Control Board, Bhavnagar

D-12

D - 12

ગુજરાત મેરીટાઇમ બોર્ડ

ગુમેબો/પર્યા/૯૧/(સી)/જાઈકા/અલંગ કેમ્પ – ૧૦ તારીખ: ૨૦/૧૦/૨૦૧૫

પ્રતિ,
૧. શ્રી વનરાજસિંહ ધીરૂભા ગોહિલ
૨. શ્રી જટુભાઈ અજીતસિંહ ગોહિલ
૩. શ્રી ડાભી હિંમતભાઈ કાળુભાઈ
૪. શ્રી ગોહિલ પ્રદિપસિંહ પ્રવિણસિંહ
૫. શ્રી રાઠોડ પ્રેમજીભાઈ ભવાનભાઈ
૬. શ્રી સોલંકી મીઠાભાઈ બેચરભાઈ
૭. શ્રી ગોહિલ રાજદિપસિંહ પી.
૮. શ્રી ગોહિલ મહાવીરસિંહ ડી.
૯. શ્રી દિહોરા વિપુલભાઈ નાજાભાઈ
૧૦. શ્રી દિહોરા ગીલાભાઈ વાલાભાઈ
૧૧. શ્રી દિહોરા ભરતભાઈ દુલાભાઈ

વિષય: ગુજરાત મેરીટાઈમ બોર્ડ દવારા રખાયેલ લોક સુનાવણીના વાંધાઓ બાબત તારીખ: ૨૦/૧૦/૨૦૧૫

શ્રીમાન,

ઉપરોકત વિષય પરત્વેની આપની લેખિત રજુઆતના સંદર્ભમાં મુદદાસર જવાબ નીચે મુજબ છે.

૧. CRZ નોટીફીકેશન ૧૯૯૧માં આવેલ હતું. અલંગ શીપ રીસાયકલીગ યાર્ડનો વિકાસ અને વિસ્તરણ ૧૯૮૧થી તબકકાવાર જરૂર મુજબ થતો આવ્યો છે. સને ૧૯૯૧ પહેલા આ પ્રકારની પ્રવૃત્તિ માટે CRZ નું કલીઅરન્સ લેવાની જરૂર રહેતી ન હતી. અત્રે નોંધ લેવાની કે ગુજરાત મેરીટાઈમ બોર્ડ હંમેશા કાયદાઓનું પાલન કરે છે તેથી જ તેના બિલ્ડીગો જેવા કે સેફટી ટ્રેઈનીગ ઈન્સ્ટીટયુટ, એલપીજી ગોડાઉન વગેરેની CRZ નું કલીઅરન્સ લીધેલ છે. સુચિત પ્રોજકટમાં સમાવવામાં આવેલ તમામ ઘટકો માટે CRZ નું કલીઅરન્સ લેવામાં આવનાર છે.
૨. આ નવો પ્રોજકટ નથી. માનનીય સુપ્રિમ કોર્ટના ઓર્ડરમાં નવા શીપ બ્રેકીગ યાર્ડ માટે સુપ્રિમ કોર્ટની મંજુરી લેવી પડે તેવો કોઈ ઉલ્લેખ નથી. માનનીય સુપ્રિમ કોર્ટના

હેડ ઓફિસ : સેકટર૧૦-એ, ''છ'' રોડ, એરફોર્સ સ્ટેશન સામે, ગાંધીનગર - ૩૮૨૦૧૦. ગુજરાત (ભારત)
ફોન : (૯૧-૦૭૯) ૨૩૨૩૮૩૪૬/૪૭/૪૮/૫૧, ફેક્સ : (૯૧-૦૭૯) ૨૩૨૩૪૭૦૪, ટેલીફેક્સ : ૦૭૯-૨૩૨૩૪૭૦૫,
E-mail : info@gmbports.in Website : www.gmbports.org

ઓર્ડર પ્રમાણે ભારત સરકારે જે રાષ્ટ્રીય કોડ બનાવેલ છે, તેના પેરા નં. ૬.૪ના ક્રમાંક ૯ પ્રમાણે નવા યાર્ડના વિકાસ માટે ઈઆઈએ નોટીફીકેશન ૨૦૦૬ ના પારા નં. ૭(ડી) પ્રમાણે પર્યાવરણની મંજુરી લેવાની રહે છે. હાલના પ્રોજકટમાં નવા પ્લોટના વિકાસ માટે ઉપરોકત જોગવાઈ મુજબ પરવાનગી મેળવવામાં આવી રહી છે.

૩. આ પ્રકારની કોઈ પણ માહિતિ રીપોર્ટમાં દર્શાવેલ નથી. તેમ છતાં સુચિત કામદાર વસાહત માટે સુએજ ટ્રીટમેન્ટ પ્લાન્ટ મુકવામાં આવશે.

૪. ડ્રાયડોક કે જેનું સ્થાન દરિયામાં છે તે જગ્યાઓ પર કોઈ મેન્ગ્રુવ અથવા અન્ય વનસ્પતિઓ આવેલ નથી.

૫. હયાત પ્લોટ માટે જે જુની પોલીસી રીન્યુ થઈ રહી છે તે જ પોલીસી નવા પ્લોટો માટે લાગુ પડશે.

૬. ડ્રાયડોકમાં માત્ર લુઝ ઝેરી પદાર્થો જેવા કે સ્લજ, ઈન્સ્યુલેટીગ પદાર્થો કે જેની જહાજ ચલાવવા માટે જરૂર નથી તેનો જ નિકાલ કરવામાં આવશે. ડ્રાયડોક એ બંધ માળખુ છે જેમાં પાણી ન જાય તેવા બંધ દરવાજા છે અને જહાજને ડ્રાયડોકમાં સમાંતર મુકવામાં આવશે. બંકરના બળતણને બહાર કાઢવામાં નહી આવે. આમ એકવાર આ પ્રકારના લુઝ અને ઈન્સ્યુલેટીગ પદાર્થો કે જેની એન્જીન અને પ્રોપેલર ચલાવાવા માટે જરૂર નથી તેને ડ્રાયડોકમાં દુર કર્યા બાદ પાણીને ડ્રાયડોકમાં ૧૧.૫ મીટર સુધી અંદર આવવા દેવામાં આવશે જેથી જહાજ આપમેળે તરવા લાગશે અને દરવાજા ખોલી નાખવામાં આવશે. ઓટ દરમ્યાન પાવરફુલ ટગની મદદથી જહાજને ડ્રાયડોકમાંથી બહાર લાવી અન્ય નજીકના પ્લોટમાં બીચ કરવામાં આવશે.

૭. હાલમાં એક મીલીયન લીટર/દિનનો પાણી પુરવઠો દરેક પ્રકારના કામ માટે પુરતો છે. તેમ છતાં જો પાણીની વધારે જરૂરીયાત રહેશે તો ગુજરાત મેરીટાઈમ બોર્ડ દવારા ગુજરાત પાણી પુરવઠા નિગમ પાસેથી યોગ્ય વ્યવસ્થા કરવામાં આવશે.

આપનો વિશ્વાસુ,

નાયબ જનરલ મેનેજર (પર્યા)
ગુજરાત મેરીટાઈમ બોર્ડ
ગાંધીનગર

નકલ સાદર રવાના:

પ્રાદેશિક અધિકારીશ્રી,
ગુજરાત પ્રદુષણ નિયંત્રણ બોર્ડ, ભાવનગર

D-12

D - 12

GUJARAT MARITIME BOARD

GMB/Env/91(C)/JICA/ Camp Alang - 10 Date : 20/10/2015

To,

1. Shri Vanrajsinh Dhirubha Gohil
2. Shri Jatubhai Ajitsinh Gohil
3. Shri Himmatbhai Kalubhai Dabhi
4. Shri Pradipsinh Pravinsinh Gohil
5. Shri Premjibhai Bhavanbhai Rathod
6. Shri Mithabhai Becharbhai Solanki
7. Shri Rajdeepsinh P. Gohil
8. Shri Mahavirsinh D. Gohil
9. Shri Vipulbhai Najabhai Dihora
10. Shri Gilabhai Valabhai Dihora
11. Shri Bharatbhai Dulabhai Dihora

Sub: **Objections regarding Public Hearing conducted by Gujarat Maritime Board on 20/10/2015**

Sir,

With respect to the written presentation on the subject mentioned above, poinwise answers are as follows:

1. CRZ Notification was enacted in 1991. It may be noted that Alang Ship Recycling Yard had come up in 1982 and gradually expanded as when plots are developed. Prior to 1991, such activities were not required to obtain CRZ Clearance. It may be noted that, GMB always follows rules & regulations. Hence GMB obtained CRZ Clearances for Safety Training Institute, LPG Storage Godowns in the plots and other common infrastructure required for labor housing colony. Project components requiring to provide to fullfill current upgradation process, are under the list of project activities in EIA for obtaining CRZ Clearance.

2. This project is not new project. There is no provision in any order of Hon"ble SC that for development of new plot, such permission of the Court is required. After issuance of direction of Hon'ble SC in 657/95 in 6th September -2007, as per one of the directions, Government of India has enacted a National Code for Ship Breaking 2013. As per provision of Sr No ix of Para No 6.4 of National Ship Breaking Code-2013, any new yard for ship breaking and as per Entry No 7(d) of EIA

Head Office : Sector - 10/A, "Chh" Road, Opp. Air Force Station, Gandhinagar - 382010. Gujarat (INDIA)
Phone : (91-079) 23238346-47-48-51 Fax : (91-079) 23234704 Telefax : 079-23234705
E-mail : gmbad1@sancharnet.in Website : www.gmbports.org

Notification-2006, current process of upgradation and development of new plots are being regulated.

3. There is no such information available in report. However, in proposed building for labor housing colony, Sewage Treatment Plant will be provided.
4. There are no mangroves or any other vegetation in dry dock sites which are located off-shore.
5. For existing plots, old policy is being enacted as new policy shortly as far as allotment and local governance is concerned and same policy will be applied to these 15 plots.
6. In dry dock, only loose hazardous materials like sludge in cargo hold tanks, insulating materials which are not required for voyage are removed in dry dock once water are drained from dry dock. Dry dock is a closed built up structure operated in water tight gates and vessels are laid in rails. Bunker fuels are not taken out. So once all such loose materials and insulating materials which are not required for running engines and propeller are removed. After decontamination of all these materials in dry dock, water are allowed through inlets and gates and full water is filled up in 11.5 m high dry dock, the decontaminated vessel is floated automatically and gates are made opened. With the help of power full tugs, flood water filled up in dry dock when flowing in ebb tide, vessel will be brought out from dry dock and in next tide same will be beached in any neighbouring plots.
7. At present, 1 MLD water supply seems adequate for all the usages. However further water requirement will have to be arranged by GMB from Gujarat Water Supply Board.

Yours faithfully,

Deputy General Manager (Env)
Gujarat Maritime Board
Gandhinagar

Copy submitted to:

The Regional Officer
Gujarat Pollution Control Board, Bhavnagar

DRAWINGS

DRG.No.MEC/Q770/11/S2/01

GUJARAT MARITIME BOARD

मैकॉन लिमिटेड

MECON LIMITED

SECTION	ENV. ENGG.	PROPOSED UPGRADATION OF ALANG - SOSIYA SHIP RECYCLING YARD
LOCATION	RANCHI	
DESIGNED	S.A.	GOOGLE EARTH IMAGE SHOWING LOCATIONS OF KEY PROJECT COMPONENTS
DRAWN	M. P.	
CHECKED AND VERIFIED	S.K.S	
APPROVED	SIG.	SCALE– AS SHOWN / SHEET / REV
	DATE	DRG.No.MEC/Q770/11/S2/01 / 1 OF 1 / 0

DRG.No.MEC/Q770/11/S2/02

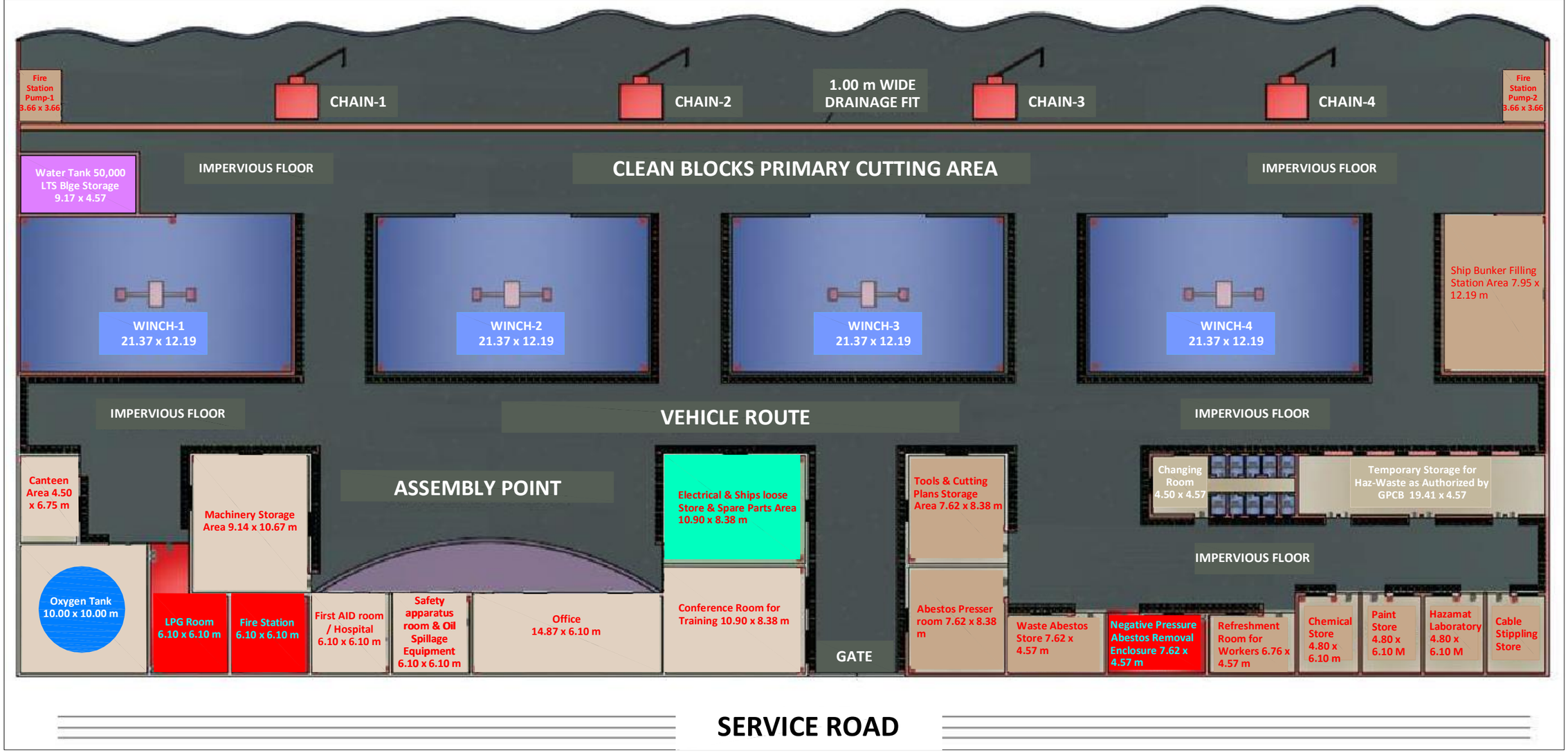
GUJARAT MARITIME BOARD

मेकॉन लिमिटेड

MECON LIMITED

SECTION	ENV. ENGG.	PROPOSED UPGRADATION OF ALANG - SOSIYA SHIP RECYCLING YARD
LOCATION	RANCHI	
DESIGNED	S.A.	DRY - DOCK 1 LAYOUT
DRAWN	M. P.	
CHECKED AND VERIFIED	S.K.S	
APPROVED	SIG.	SCALE– AS SHOWN / SHEET / REV
	DATE	DRG.No.MEC/Q770/11/S2/02 / 1 OF 1 / 0

DRG.No.MEC/Q770/11/S2/03



GUJARAT MARITIME BOARD

मेकॉन लिमिटेड

MECON LIMITED

SECTION	ENV. ENGG.	PROPOSED UPGRADATION OF ALANG - SOSIYA SHIP RECYCLING YARD
LOCATION	RANCHI	
DESIGNED	S.A.	LAYOUT OF MODERNISED PLOT
DRAWN	M. P.	
CHECKED AND VERIFIED	S.K.S	
APPROVED	SIG.	SCALE– N.T.S
	DATE	DRG.No.MEC/Q770/11/S2/03

SHEET	REV
1 OF 1	0

DRG.No.MEC/0770/11/S2/04

LEGEND

Item No.	Item
1	Office Building
2	Weighbridge
3	Incinerable Waste Storage Area
4	Landfill Cell 1
5	Landfill Cell 2
6	Landfill Cell 3
7	Landfill Cell 4
8	Temple
9	Incinerator Building
10	LDO Storage Tank
11	Incinearator Chimney
12	Waste Water Tank
13	Effluent Treatment Plant
14	Fire Hydrant & Pump Room
15	Evaporation Pond
16	Leachate Tank 1
17	Leachate Tank 2
18	Green Belt / Landscape
19	Staff Car Parking
20	O.H. Water Tank
21	Roads
22	Wheel Wash

EXISTING FACILITY

PROPOSED FACILITY

1. PROPOSED INCINERATOR BLOCK
   CAPACITY : 25 Tonnes Per Day
   AREA : 875.00 SQ Mtr

2. PROPOSED WASTE OIL RECOVERY & EFFLUENT TREATMENT SYSTEM
   CAPACITY : 30 KLD (Effluent Treatment), 4 KLD (Oil Recovery)
   AREA : 1400.00 SQ. Mtr.

GUJARAT MARITIME BOARD

मेकॉन लिमिटेड

MECON LIMITED

SECTION	ENV. ENGG.	PROPOSED UPGRADATION OF ALANG - SOSIYA SHIP RECYCLING YARD	
LOCATION	RANCHI		
DESIGNED	S.A.	LAYOUT OF TSDF SITE	
DRAWN	M. P.		
CHECKED AND VERIFIED	S.K.S		
APPROVED	SIG.	SCALE– NOT TO SCALE	SHEET 1 OF 1 / REV 0
	DATE	DRG.No.MEC/Q770/11/S2/04	

DRG.No.MEC/Q770/11/S2/01

N

Legend

Ambient Air Quality Monitoring Stations
- A1 Alang Fire Station
- A2 Village Alang
- A3 Village Sosiya
- A4 Village Mathavda
- A5 Village Kathava

Surface Water Sampling Location
- SW1 Pasvivali Creek
- SW2 Sea, intertidal zone at southern end of existing yard
- SW3 Sea, intertidal zone at site of Dry Dock 2
- SW4 Sea, intertidal zone near Alang Fire Station
- SW5 Sea, intertidal zone near Jaspara Village
- SW6 Sea, off southern end of existing yard
- SW7 Sea off Dry-dock 2 Site
- SW8 Sea, off Alang Fire Station
- SW9 Sea, off Jaspara Village

Ground Water Sampling Stations
- GW1 Tube-well at vill. Kathava
- GW2 Tubewell at vill. Sosiya
- GW3 Tubewell at vill. Alang
- GW4 Tubewell at vill. Mathavda

Ambient Noise Monitoring Stations
- AN1 Alang Fire Station
- AN2 Village Alang
- AN3 Village Sosiya
- AN4 Village Mathavda
- AN5 Village Kathava
- N6 Village Chopada
- N7 Village Bharpara

Soil Sampling Locations
- S1 Manar Village
- S2 Manar Village
- S3 Alang Village
- S4 Alang Village
- S5 Landfill Site in Alang TSDF

0 0.5 1 2 3 4 Km

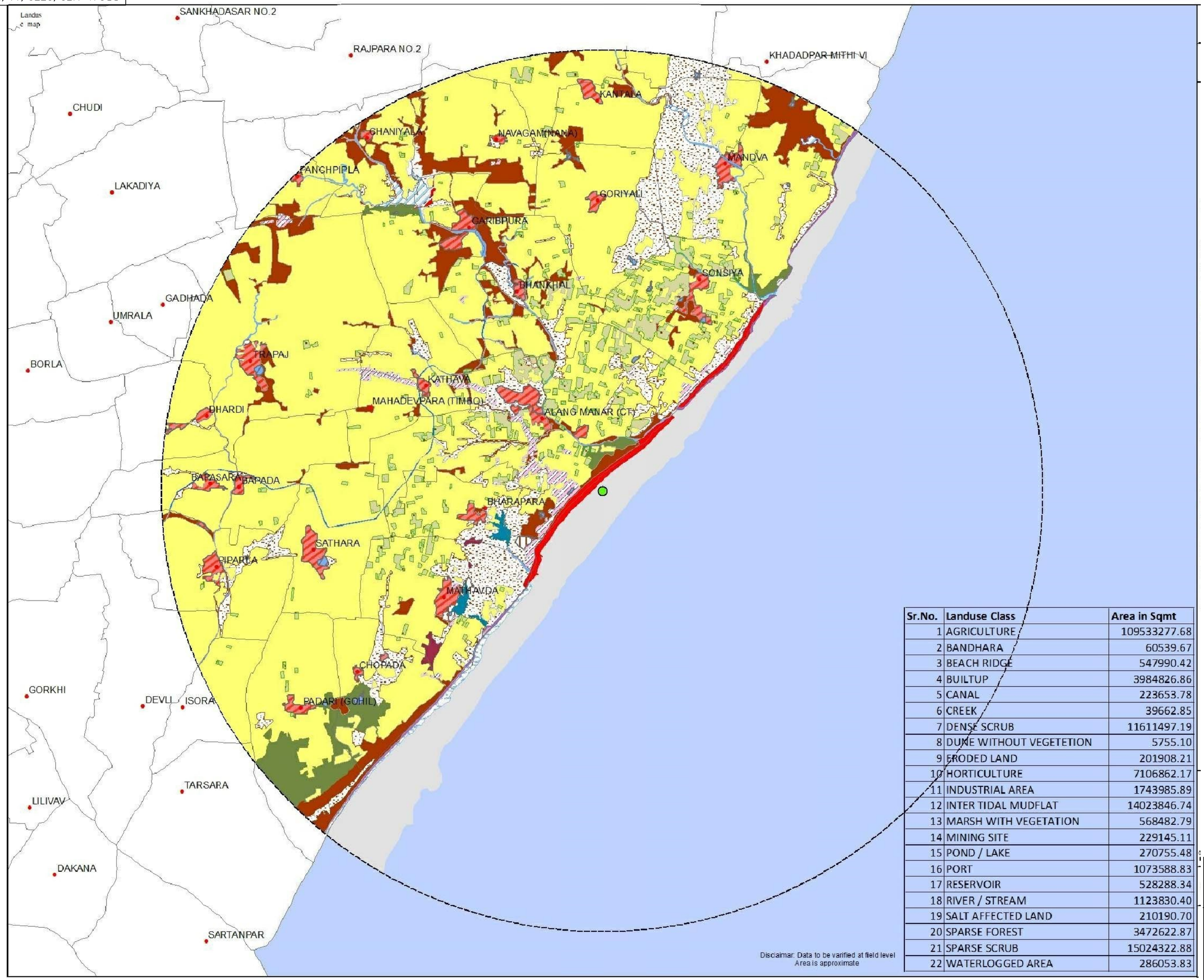
GUJARAT MARITIME BOARD

मैकॉन लिमिटेड

MECON LIMITED

SECTION	ENV. ENGG.	PROPOSED UPGRADATION OF ALANG - SOSIYA SHIP RECYCLING YARD
LOCATION	RANCHI	
DESIGNED	S.A.	GOOGLE WARTH IMAGE OF STUDY AREA SHOWING LOCATIONS OF MONITORING STATIONS
DRAWN	GD	
CHECKED AND VERIFIED	PANI	
APPROVED	SIG.	SCALE– AS SHOWN / SHEET / REV
	DATE	DRG.No.MEC/Q770/11/S2/01 / 1 OF 1 / 0

DRG.No.MEC/Q770/11/S2/06



Disclaimar: Data to be varified at field level
Area is approximate

Sr.No.	Landuse Class	Area in Sqmt
1	AGRICULTURE	109533277.68
2	BANDHARA	60539.67
3	BEACH RIDGE	547990.42
4	BUILTUP	3984826.86
5	CANAL	223653.78
6	CREEK	39662.85
7	DENSE SCRUB	11611497.19
8	DUNE WITHOUT VEGETETION	5755.10
9	ERODED LAND	201908.21
10	HORTICULTURE	7106862.17
11	INDUSTRIAL AREA	1743985.89
12	INTER TIDAL MUDFLAT	14023846.74
13	MARSH WITH VEGETATION	568482.79
14	MINING SITE	229145.11
15	POND / LAKE	270755.48
16	PORT	1073588.83
17	RESERVOIR	528288.34
18	RIVER / STREAM	1123830.40
19	SALT AFFECTED LAND	210190.70
20	SPARSE FOREST	3472622.87
21	SPARSE SCRUB	15024322.88
22	WATERLOGGED AREA	286053.83

Legend

- Settlement
- Alang Ship Yard
- 10km Buffer
- Village Boundary

LANDUSE

CLASS

- AGRICULTURE
- BANDHARA
- BEACH RIDGE
- BUILTUP
- CANAL
- CREEK
- DENSE SCRUB
- DUNE WITHOUT VEGETETION
- ERODED LAND
- HORTICULTURE
- INDUSTRIAL AREA
- INTER TIDAL MUDFLAT
- MARSH WITH VEGETATION
- MINING SITE
- POND / LAKE
- PORT
- RESERVOIR
- RIVER / STREAM
- SALT AFFECTED LAND
- SPARSE FOREST
- SPARSE SCRUB
- WATERLOGGED AREA
- Sea

N

0 0.4 0.8 1.6 2.4 3.2 km

Data Source : (1)Settlement Commissionerate& Land Records
(2) IRS Satellite Data of year 2011-12

GUJARAT MARITIME BOARD

मेकॉन लिमिटेड

MECON LIMITED

SECTION	ENV. ENGG.	PROPOSED UPGRADATION OF ALANG - SOSIYA SHIP RECYCLING YARD
LOCATION	RANCHI	
DESIGNED	S.A.	
DRAWN	GD	LAND USE IN STUDY AREA
CHECKED AND VERIFIED	PANI	
APPROVED	SIG.	SCALE– AS SHOWN / SHEET 1 OF 1 / REV 0
	DATE	DRG.No.MEC/Q770/11/S2/06