karaikal port

ISO 9001
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Ref No: KPPL / ENV / MOEF&CC / 2017 / 01 Date: 06.02.2017

To

The Member Secretary,

Infrastructure and Miscellaneous Projects & CRZ (Infra 2)

Ministry of Environment, Forest & Climate Change (MOEF&CC)

Jor Bagh Road,

New Delhi - 110003.

Sub: Submission of additional information /clarifications sought by the Expert Appraisal Committee members during the 12th EAC meeting held on 26th December 2016 regarding:-

Ref: Minutes of the meeting of the12th EAC held on 26th December 2016; Proposal 11-41/2013-IA.III;IA/PY/MIS/19327/2013.

Sir,

With reference to the above, Karaikal Port Private Limited hereby furnishes the clarifications / additional information sought by the Expert Appraisal Committee members during the 12th EAC meeting held on 26th December 2016 and attached as an annexure I.

Minutes of the meeting of the12th EAC held on 26th December 2016 (Relevant pages) are also attached herewith as annexure II.

We request you to kindly include our proposal (Development of Bulk Liquid Berth for handling LNG at Karaikal Port, Puducherry by M/s Karaikal Port Private Ltd. – Environment Clearance reg). (11-41/2013 -IA.III; IA/PY/MIS/19327/2013) in the next EAC meeting

In case of clarifications the undersigned may be contacted.

Thank you for the anticipated cooperation.

Yours faithfully,

(Capt. Prasad Rebala)

Chief Operating Officer

Enclosure: As mentioned above.

KARAIKAL PORT PRIVATE LIMITED

CIN: U45203PY2006PTC001945

Registered Office

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Corporate Office

Chettinad Business Chamber, 3rd Floor, Dr. Radhakrishnan Salai, 5th Street (Near AVM Rajeswari Marriage Hall)

Mylapore, Chennai 600 004. Tel. : +91 44 4562 2000 Fax : +91 44 4562 2082

Annexure I

CLARIFICATIONS

MINUTES OF THE MEETING OF THE EAC HELD ON 26th DECEMBER 2016

(Proposal - 11-41/2013- IA.III; IA/PY/MIS/19327/2013)

DEVELOPMENT OF BULK LIQUID BERTH FOR HANDLING LNG AT KARAIKAL PORT

EAC comments

a) *Copy of certified compliance report issued by the Regional office, Chennai/Bangaluru on the environmental condition stipulated in the existing EC.*

b) *As per EIA report, cargo handling capacity of the existing port is mentioned as 21.5 TPA and some place it is mentioned as 32 MTPA. Pl. clarify.*

c) *The project proponents were advised to prepare a detailed biodiversity impact assessment report and management plan through the NIO's or any other institute of repute on marine, brackish water and fresh water ecology and biodiversity. The report shall study the impact on the rovers, estuary and the sea and include the intertidal biotopes, corals and coral communities, molluscs, sea grasses, sea weeds, subtidal habitats, fishes, other marine and aquatic micro and macro and mega flora and fauna including benthos, plankton, turtles, birds etc. as also the productivity. The data collection and impacts assessment shall be as per standard survey methods.*

d) *Prediction of ground level concentration for the emission from turbine/boiler of FSRU ship.*

e) *A management plan to control temperature difference between intake water, and discharge shall be submitted along with possible impacts and managed strictly.*

f) *The impact assessment shall also study the impact on the/of the dumping ground through dredging disposals.*

Clarification (C1):

a) Copy of certified compliance report issued by the Regional office, Chennai/Bengaluru on the environmental condition stipulated in the existing EC.

Monitoring Report

Date of Monitoring: 6th and 7th January, 2016

Subject: Environmental and CRZ clearance for expansion of Karaikal Port (Phase II) by M/s. Karaikal Port Pvt. Ltd,. Karaikal, Puducherry.

Reference: MoEF&CC's EC letter No. 10-42/2009-IA.III dated the 22nd September, 2009 & RO of the MoEF&CC at Chennai - F. No. EP/12.1/2/2015/PY.

S. No	Specific Conditions as contained in the Environmental and CRZ clearance	Compliance Status
(i)	The quality of river water of both the rivers shall be re-assessed and report shall be submitted to the Ministry within three months.	As reported the same is complied.
(ii)	No construction work other than those permitted in Coastal Regulation Zone Notification shall be carried out in Coastal Regulation Zone area.	As reported, complied.
(iii)	Washing from Auction Hall/Sewage shall be treated and the Treatment facility shall be provided in accordance with the Coastal Regulation Zone Notification. 1991. The disposal of treated water shall confirm the regulation of Puducherry Pollution Control Board.	As reported, the provision of Auction Hall is not required for the Project; and Sewage Treatment Plant with a capacity of 25 KLD installed for treatment of domestic sewage and treated water quality conforming to the regulation of PPCC.
(iv)	Putrefied and discarded parts of fishes shall be removed and disposed off in the approved landfill/used as manure/poultry feed.	As informed this condition does not pertains to this project.
(v)	Oil Spills if any shall be properly collected and disposed as per the Rules.	As reported till date there is no Oil Spill occurrence. Requisite equipment procured, and the contingency plan for containing the Oil Spill is in place.
(vi)	The approach channel shall be properly demarcated with lighted buoys for safe navigation and adequate traffic control guidelines shall be framed. The fishermen shall be suitably educated and informed about the traffic guidelines.	As reported and explained with pictographical illustration, in accordance with International norms requisite provisions are in place thereby following Navigation and traffic control guidelines. Through Department of Fisheries, Govt. of Puducherry awareness and Education are regularly imparted to the fishermen including the said traffic guidelines.
(vii)	The project proponent shall set up separate environmental management cell for effective implementation of the stipulated environmental safeguards under the supervision of a Senior Executive.	As reported, complied.

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(viii)	The project proponent shall take up mangrove plantation/green belt in the project area, wherever possible. Adequate budget shall be provided in the Environment Management Plan for such mangrove development.	As reported and observed the efforts made for green belt, complied. However, details of expenditure incurred so far and funds allocated for the last 3 years not provided.
(ix)	The funds earmarked for environment management plan shall be included in the budget and this shall not be diverted for any other purposes.	As reported the funds earmarked for environment management plan for 2014-15 and 2015-16 is about Rs.65 lakh and Rs.150 lakh respectively.
S.No	**General Conditions as contained in the Environmental and CRZ clearance**	**Compliance Status**
(i)	Adequate provision for infrastructure facilities including water supply, fuel and sanitation must be ensured for construction workers during the construction phase of the project to avoid any damage to the environment.	As reported, complied.
(ii)	Appropriate measures must be taken while undertaking digging activities to avoid any likely degradation of water quality.	As reported, digging activities were carried out to the extent of erecting pillars for operation of Coal Handling Mechanization Project by adopting advanced technological practices and therefore degradation of ground water quality is not envisaged.
(iii)	Borrow sites for each quarry sites for road construction material and dump sites must be identified keeping in view the following: (a) No excavation or dumping on private property is carried out without written consent of the owner. (b) No excavation or dumping shall be allowed on wetlands, forest areas or other ecologically valuable or sensitive locations. (c) Excavation work shall be done in close consultation with the Soil Conservation and Watershed Development Agencies working in the area, and (d) Construction spoils including bituminous material and other hazardous materials must not be allowed to contaminate water courses and the dump sites for such materials must be secured so that they shall not leach into the ground water.	As reported, the Road construction involved to the extent of sideways from the existing roads already in place under this Phase of the Project. In view of this, these conditions are not applicable.
(iv)	The construction material shall be obtained only from approved quarries. In case new quarries are to be opened, specific approvals from the competent authority shall be obtained in this regard.	As reported, construction material obtained from M/s Marg Constructions Limited known for its core competence of marine infrastructure & industrial projects, Chennai; and the Project Authority never envisaged for requirement of new quarries in this regard.

(v)	Adequate precautions shall be taken during transportation of the construction material so that it does not affect the environment adversely.	As observed and reported, complied.
(vi)	Full support shall be extended to the officers of this Ministry/Regional Office at Bangalore by the project proponent during inspection of the project for monitoring purposes by furnishing full details and action plan including action taken reports in respect of mitigation measures and other environmental protection activities.	Agreed to comply.
(vii)	Ministry of Environment & Forests or any other competent authority may stipulate any additional conditions or modify the existing ones, if necessary in the interest of environment and the same shall be complied with.	Agree to comply.
(viii)	The Ministry reserves the right to revoke this clearance if any of the conditions stipulated are not complied with the satisfaction of the Ministry.	Noted and Agreed upon.
(ix)	In the event of a change in project profile or change in the implementation agency, a fresh reference shall be made to the Ministry of Environment and Forests.	Noted and Agreed upon.
(x)	The project proponents shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of land development work.	As reported, on 12th June, 2009, the financial closure was achieved; and the project is a continuity of Phase I.
(xi)	Puducherry Pollution Control Board shall display a copy of the clearance letter at the Regional Office, District Industries Center and Collector's Office/Tehsildar's office for 30 days.	As informed, the Puducherry Pollution Control Committee complied.
8	These stipulations would be enforced among others under the provisions of Water (Prevention & Control of Pollution) Act 1974, the Air (Prevention and Control of Pollution) Act 1981, the Environment (Protection) Act, 1986, the Public Liability (Insurance) Act, 1991 and EIA Notification 1994, including the amendments and rules made thereafter.	As informed, being complied.
9	All other statutory clearances such as the approvals for storage of diesel from Chief Controller of Explosives. Fire Department, Civil Aviation Department, Forest Conservation Act, 1980 and wildlife (Protection) Act, 1972 etc., shall be obtained as applicable by project proponents from the respective competent authorities.	As reported, requisite clearances obtained from the concerned competent authorities.

10	The project proponent shall advertise in at two local Newspapers widely circulated in the region, one of which shall be in the vernacular language informing that the project has been accorded Environmental Clearance and copies of clearance letters are available with the Puducherry Pollution Control Board and may also be seen on the website of the Ministry of Environment and Forests at http://www.enfor.nic.in. The advertisement should be made within 10 days from the date of the receipt of the Clearance letter and a copy of the same should be forwarded to the Regional Office of this Ministry at Bangalore.	As reported, complied.
11	Environmental Clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundations Vs. Union of India in Writ Petition (Civil) No.460 of 2004 as may be applicable to this project.	Agreed upon.
12	Any appeal against the Environment Clearance shall lie with the National Environment Appellate Authority, if preferred, within a period of 30 days as prescribed under Section 11 of the National Environment Appellate Act, 1997.	Noted.
13	A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zilla Parisad/Municipal Corporation, Urban Local body and the Local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the company by the proponent.	As reported, complied.
14	The proponent shall upload the status of compliance of the stipulated EC conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MoEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant level namely SPM, RSPM, SO_2, NOx (Ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the project shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.	Not uploaded on the website. As reported, the compliance report for January to June 2015 is merely water and ambient air quality reports only.

15	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated EC conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF, the respective Zonal Office of CPCB and the SPCB.	Six monthly reports on the status of compliance of the stipulated EC conditions including results of monitored data (both in hard copies as well as by e-mail) as reported by the PP. The same may be requested to submit same for record and reference of this office.
16	The environmental Statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986 as amended subsequently, shall also be put on the website of the company along with the status of compliance of EC conditions and shall also be sent to the respective Regional Offices of MoEF by e-mail.	As reported, the environmental Statement for each financial year ending 31st March, 2015 in Form-V submitted to the then Ro at Bangalore. And copy to PPCC, Puducherry.

It has the approval of Additional PCCF (Central), RO of the MoEF & CC vide dy.No.529 dated 2nd May, 2016.

(Dr. S.V. Reddy)
Scientist 'F'
3rd May, 2016

Clarification (C2):

b) As per EIA report, cargo handling capacity of the existing port is mentioned as 21.5 TPA and some place it is mentioned as 32 MTPA. Pl. clarify.

Karaikal port has five operational berths presently with a handling capacity of 21.5 MTPA (Million Tons Per Annum). On the otherhand Port has handled in total of around 32 Million Tonnes of various cargoes over the period of six years from 2009 to 2015. Accordingly now it is worded in the EIA report.

Clarification (C3):

c) The project proponents were advised to prepare a detailed biodiversity impact assessment report and management plan through the NIO's or any other institute of repute on marine, brackish water and fresh water ecology and biodiversity. The report shall study the impact on the rivers, estuary and the sea and include the intertidal biotopes, corals and coral communities, molluscs, sea grasses, sea weeds, subtidal habitats, fishes, other marine and aquatic micro and macro and mega flora and fauna including benthos, plankton, turtles, birds etc. as also the productivity. The data collection and impacts assessment shall be as per standard survey methods.

The detailed study as sought on the following parameters has been carried out by Indomer Coastal Hydraulics (P) Ltd., Chennai, an ISO 9001:2015 certified organization and QCI (NABET) accredited organization vide SI.No.81 for Sector 27: Oil & Gas Transportation pipeline (crude and refinery/petrochemical products) passing through national parks/sanctuaries/coral reefs/ecologically sensitive areas including LNG Terminal and Sector 33: Ports, harbours, jetties, marine terminals, breakwaters and dredging and promoted under NIO-CSIR Technology Promotion Scheme. The parameters covered are:

- Rivers, Estuary and Sea
- Intertidal biotopes
- Corals and coral communities
- Molluscs,
- Sea grasses and sea weeds
- Subtidal habitats,
- Fishes,
- Benthos and productivity,
- Plankton and productivity,
- Turtles, and
- Birds

The data collection and impact assessment has been carried out based on the standard survey method as adopted in CSIR-National Institute of Oceanography, GOA.

Rivers, Estuary and Sea:

Rivers: The study area is a typical coastal plain and forms a part of the Cauvery delta with five draining rivers as shown in the Fig. C1. These rivers are: i) Vettar River, ii) Paravanar River, iii) Tirumalarajanar River, iv) Aransalar River and v) Vanjirar River. The Vettar River is flowing on the south just adjacent to the port. Paravanar River is flowing along the north border of the port through the Karaikal district. Tirumalarajanar River lies in the north of the study area and it is flowing through the Karaikal district. Aransalar and its tributary Vanjirar River lies further north of the port and flowing through the Karaikal district.

There will not be any dumping or reclamation in and the vicinity of Karaikal Port. Therefore the proposed activity will not have any impact on the Rivers around the project region. Since the development is within the Port basin there will not be any impact on the fishing activity.

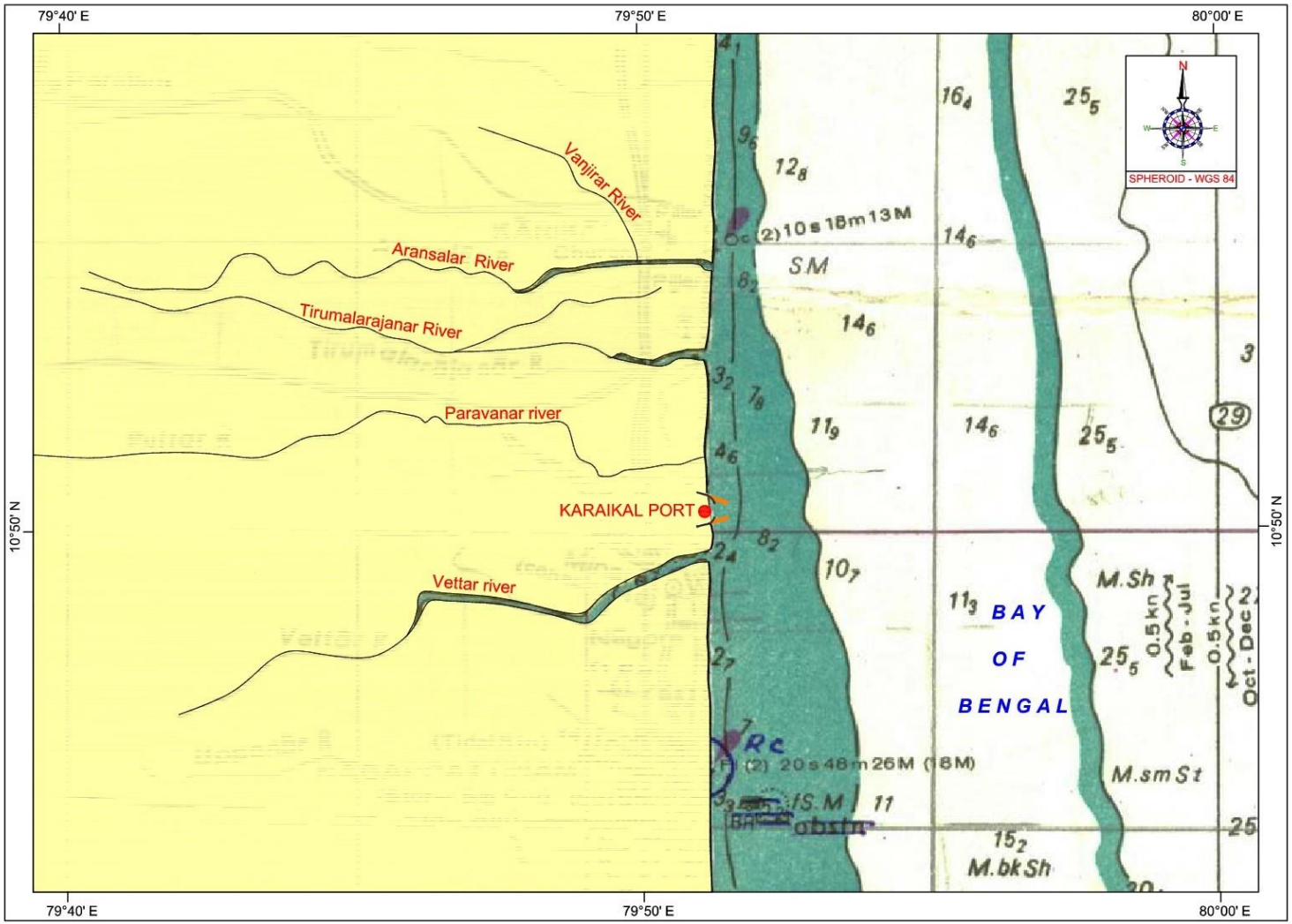


FIG. C1. RIVERS AROUND THE KARAIKAL PORT

Water Bodies: Around 3% of the fresh water bodies such as ponds, canals and rivers are observed in 10 km vicinity of the project region. These fresh water bodies observed with algal growth covered with floating aquatic angiosperms like *Lemna, Pistia,* and Echornia etc. This may be because of primary use for washing/cleaning purpose. Of them, some ponds observed to invite avifauna and few mammalian species. Several channels emerging out of them feeds water to surrounding agriculture.

Image showing Sivan Kulam Lake in Nagore (left) & Canal from Puravadalyanar River near Kannappan Iron & Steel Company (right)

Lake near Panangudi and aquatic species therein

Lake behind PIPDIC and fauna observed (Cow & Sand Piper)

Commom floral speies observed in water bodies are *Ipomoea aquatica, Typha,* Nymphia *sp., Eichhornia crassipes Lemna* etc. Common faunal species are brahminykite, Kingfishers etc.

Intertidal biotopes:

Biotope is an area of uniform environmental conditions providing a living place (habitat) for a specific assemblage of plants and animals. The tidal exposure and percentage composition of sediment particles and organic matter were the main factors influencing the animal abundance in an intertidal area. The seasonal variation in the environmental parameters greatly influence the distribution and abundance of the organisms in an ecosystem. The present biological parameters were collected during the month of August which is a pre monsoon/summer period at Karaikal. The macro fauna at this inter tidal benthic region was found to be dominated by Amphipods and *Emerita* sp. belonging to Crustacean group followed by Polychaete worms and few number of *Donax* sp. belonging to a bivalvia group under the Phylum Mollusca. The coast is sandy in nature and supports salt tolerance plants like *Prosobis* sp.and *Casuarina* sp.

Mollusca:

The study indicates that the distributin of Molluscs are scanty in the intertidal region which is represented only by *Donax* sp. However, there are few species of molluscs (Gastropods, Bivalves) are seen inside the port basin.

Corals and coral communities:

There are no coral communities present in the Port region and in the sea off Karikal. Sub-tidal samplings conducted at 10 locations spread over 150 sq. km did not show any presence of corals. Extended study on the seabed was carried out from Thrangambadi (20 km) and south Vedaranyam (50 km). The study indicates the

absence of coral along this segment of the coastline.

Sea grasses and sea weeds:

Thorough inspection was carried out along the coastal region of the port. It shows the absence of seaweeds and sea grass.

Subtidal habitats:

The sediment characteristics of the study area showed very fine sand followed by silt & clay and medium sand. The subtidal sampling was done at a stretch of 10 km, the study shows that the numerical abundance of the benthic fauna varied from 120 nos./m^2 to 350 nos./m^2 inside harbour basin. The benthic fauna ranged from 130 nos./m^2 to 660 nos./m^2 at open sea. The faunal population mainly consists of Polychaetes followed by Amphipods, Bivalves, Gastropoda and Mysids. Amphiouxis sp., of cephalochordate was recorded at deeper depth. More details are given in the EIA report in page no. 14.27 and also in Table 14.15.

Fishes:

Karaikal has a total number of 10 fishing villages along the 20 km long coastline. The available data indicate that the yearly fish landings are not constant and fluctuate widely. The latest marine fish landing figures of this region as per Fisheries Department of Karaikal is given below.

Sl. No	Fish type/ species	Years & Production (MT)	
		2013 - 14	2014 - 15
1	Elasmobranchs	129.933	135.933
2	Oil sardine	135.800	135.800
3	Other sardines	175.167	173.167
4	Anchovies	329.800	365.800
5	Trichiurus sp.	283.733	293.733
6	Other Clupeides	198.133	233.133
7	Chirocentrus sp.	199.400	212.400
8	Harpodon nehereus	108.467	108.467
9	Cat fishes	165.167	176.167
10	Saurida sp.	213.833	234.833
11	Eel	164.733	160.733
12	Belone & Hemiramphus spp.	181.133	381.133

Sl. No	Fish type/ species	Years & Production (MT)	
		2013 - 14	2014 - 15
13	Exocoetus	189.800	165.800
14	Bregmoceros	265.233	262.233
15	Sphyreana	250.000	261.000
16	Mullets	127.067	327.067
17	Polynemids	119.467	119.467
18	Perches	214.600	199.600
19	Perch like fishes	192.133	209.133
20	Lactarius sp.	382.800	282.800
21	Caranx sp.	286.800	273.800
22	Chorinemus sp.	340.733	323.733
23	Elangatis	245.800	254.800
24	Other Carangids	362.133	262.133
25	Leiognathus – Silver bellies	284.133	285.133
26	Sciaenids	237.800	363.800
27	Red mullets	322.800	322.800
28	Ribbon fishes	116.500	314.500
29	Mackerels	375.067	369.000
30	Seer Fishes	253.000	125.567
31	Tunnies	269.167	302.167
32	Pomfrets	175.567	375.567
33	Soles	122.867	362.867
34	Penaeids	160.900	198.900
35	Non-Penaeids	285.533	267.533
36	Lobsters	159.900	197.900
37	Deep sea lobsters	110.233	254.233
38	Other crustaceans	107.533	107.533
39	Molluscs	250.233	275.233
40	Miscellaneous	616.233	679.233
41	**TOTAL**	**9109.331**	**10344.831**

** Source- Department of fisheries & fishermen welfare, Karaikal.*

An overall increase of little over 10% of fish landing from the year 2013-14 to 2014-15 has been witnessed in this region. From the recent fisheries statistics collected during the period of April 2016 to September 2016 the fish productivity has been increased more than the cumulative productivity of previous year.

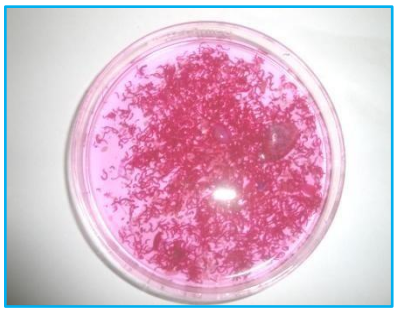
It is noticed that seventy percent of the catch is by the mechanized boats. According to the recent survey conducted by the Karaikal Fisheries Department (2009-10), the total fishermen population is about 18,462, with 3464 families, out of which only 2,271 are active men and over 1,100 are active fisherwomen.

A variety of fishing crafts, like mechanized boats, wooden vallams, FRP vallams, wooden catamarans, FRP catamarans, are used in this region. About 251 mechanized boats, 389 FRP catamaran, 26 Wooden catamaran with OBM, 1 FRP catamaran without OBM and 45 wooden catamaran without OBM and non-mechanized boats are engaged in fishing activities during day and night. Among the fishing gears, Gill nets, Trawl nets, Seine nets, Tangle nets, Hook nets, Bag nets, Lift nets etc. are primarily used for fishing by these communities. However, trawl nets and gill nets are the most popular gears among the fishing communities.

In general, the dominant species of the Karaikal region are fishes such as sharks, skates, oil sardines, lesser sardines, *Thrissocles*, Perches, *Caranx*, *Chirocentrus*, anchovies, silver bellies, seerfish, eels, ribbon fish, clupeides, *Sphyraena* sp., mullets, *Leiognathus*, mackerels, tunnies, Pomfrets, sciaenids, Trichiuridae, crabs (*Portunus sanguinolentus*) and penaeid prawns represented by *Penaeus monodon, P. indicus, Metapenaeus monoceros* and *M. dobsoni.*

Intertidal benthos: The intertidal faunal population is measured at four locations. The existence of fauna appeared to be low in all four stations (IB1 to IB4). The numerical abundance of the inter tidal benthic fauna varied from 90 to 360 nos./m^2. Amphipods were the dominant group followed by Polychaetes and *Emerita* sp. Gastropods were completely absent in the study area. However, a few *Donax* sp. (bivalves) were recorded at one location.

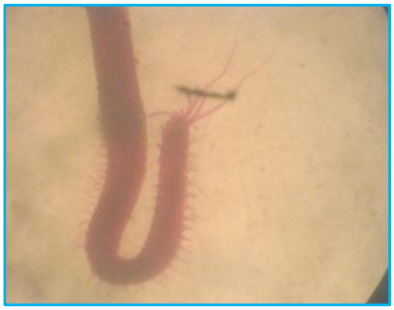
In general, the subtidal benthic population was about 3 to 4 times more than intertidal benthic population. Polycaetes was the dominant group found at the subtidal region. Polychaetes were collected from almost all the ten subtidal benthic region with the maximum of 590 nos./$m^2$and the minimum of 80 nos./m^2.



Macro benthic oragnisms

Prionospia sp.

Perinereis sp.



Onuphis sp.

Phytoplankton: Samples were collected at ten locations, covering eight at open sea and two inside harbour basin. The results indicate that the area is good productive and the values varied from 360 to 480 mg C/m^3/day in harbour basin. The values ranged from 360 to 600 mg C/m^3/day in coastal waters. It appears that the northern zone is slightly higher in productivity. In open sea, the higher values of 600 mg C/m^3/day was observed at 2 km radius and at 10 km radius. Inside the harbour basin, at 2 km radius and at 5 km radius recorded slightly lower values. In general, seven stations recorded more values (480 mg C/m^3/day) compared to the average value (468 mg C/m^3/day) recorded in the study area. The values are compared to other productivity values recorded along the east coast of India.

The floral diversity fluctuated from 33 to 39 species in the harbour basin and the phytoplankton diversity ranged from 35 to 42 species in coastal waters. Bacilleriophyceae (Diatoms) formed the major group followed by Dinophyceae

(Dianoflagellates) and Cyanophyceae (blue green algae). Phytoplankton population analyzed at various stations showed that their numerical abundance varied from 34638 nos./l and 68939 nos./l in harbour basin. The coastal waters phytoplankton population varied from 7166 nos./l to 31643 nos./l. The most dominant species found in this region are *Pseudonitzschia* sp. (49.04%), *Pleurosigma normanii* (3.91%), *Thalassiothrix frauenfeldii* (3.52%) and *Thalassionema nitzschioides* (2.84%) among Pennales, *Rhizosolenia alata* (8.58%) and *Coscinodiscus radiatus* (2.22%) among Centrales.

As many as 64 species of phytoplankton (net and unit samples put together) represented by 3 diverse groups namely, diatoms (51 species consisting of 36 centrales and 15 pennales), dinophyceans (12) and cyanophyceae (1). There were relatively fewer (43) species in the unit samples. Overall, bacillariophyceans remained the largest group (20 species). In general, *Rhizosolenia alata*, *Pseudonitzschia* sp., *Pleurosigma normanii*, *Thalassiothirx frauenfeldii* and *Prorocentrum micans* to be found at all stations. Overall, pennales formed the bulk (67%) of the population followed by centrales (22%), dinophyceans (10%) and Cyanophyceans (1%). The same thing was also reflected in the population numbers. *Rhizosolenia alata, Thalassiosira subtilis*, *Navicula henneydii*, *Thalassiothirx frauenfeldii*, and *Prorocentrum micans* were recorded in good numbers at all the stations. *Rhizosolenia alata* and *Pseudonitzschia* sp. was the dominant species found at all station.

Zooplankton: The zooplankton species diversity fluctuated from 27 to 30 inside harbour basin. In coastal waters zooplankton species diversity varied from 26 to 36. The zooplankton data indicated a high standing stock in the area of observation. Zooplankton population analysis at various stations showed that their numerical abundance varied from 71740 nos./100 m^3 and 104436 nos./100 m^3 at inside harbour basin and the zooplankton population from coastal waters ranged between 80346 nos. /100 m^3 to 243789 nos. /100 m^3. The percentage occurrence of various groups also varied from place to place.

The zooplankton biomass varied from 30.1 ml/100 m^3 to 71.8 ml/100 m^3 inside harbour basin and the coastal waters varied from 31.1 ml/100 m^3 to 67.7 ml/100 m^3. Zooplankton population in this region was mostly dominated by the following species. *Evadne*species (44.16%) among cladocerans and copepods represented by *Temora turbinata* (14.52%), *Acartia erythraea* (7.35%), *Paracalanus parvus* (4.25%), *Acrocalanus gracilis* (2.87%) and *Eucalanus attenuatus* (2.17%). In general, *Tintinnopsis* sp., among tintinnids, *Sagitta* sp., Bivale veliger larvae, *Acartia erythraea*, *Acrocalanus gracilis*, *Eucalanusattenuates*, *Paracalanus parvus*, *Temora turbinata*, Copepod nauplii, *Corycaeus danae*, *Evadne* sp., Mysid larvae, *Lucifer* sp., Oikopleura larvae and Fish eggs to be found at all stations.

More details are given in the EIA report in page no. 14.24 to 14.26 and also in Tables 14.9 to 14.14.

Turtle:

During the period of survey, no stranded or dead turtles (Olive Ridleys) were noticed on the Karaikal coast. However, earlier surveys conducted by others (Bupathy *et.al.,*2006) indicate that the average turtle mortality of Nagapattinam coast, of which Karaikal forms a part, is only 3 per km over a period of one year, mainly January – April. Further, it was also shown that mortality of turtles in the area was largely due to fishing activities. The nesting density is also low for this region i.e. 7 to 15 per km for one year. It must also be pointed out that no data specific for Karaikal exist and so the data available for the Nagapattinam coast only has to be taken for drawing conclusions. It has been proposed to conserve the sporadic nesting of turtles in association with Puducherry Forest Department and/or Student Sea Turtle Conservation Network (SSTCN). An annual budget of around Rs. 5 lakhs can be allotted to preserve the sporadic nesting if any.

Mangroves: There is no well-established mangrove vegetation in the project area. However, small patches of short shrubs of mangrove plants were noticed along the banks of the Vettar mouth. Fringing mangroves, essentially *Avicennia* sp. in isolated patches were seen on the banks of the Paravanar River also. During rainy waters, as the river carries lots of silt and water, they get normally submerged. During fair-weather season, the tidal influence helps them to recover and re-establish. However, the proposed development will not have any impacts on the mangroves patches existing in the Vettar River.

Discussion:

Based on the baseline data collected and modelling studies it has been observed that the development will not have any impact on Vettar River, Puravadaiyanar River, Tirumalarajanar River, Aransalar River and its tributary Vanjirar River, and also in the open sea. It will not have any destructive impact on the intertidal benthic organisms. There are no coral communities. There will not be any significant impact on the biotopes and molluscs as they are found in small numbers. There is no sea grass or seaweed in the proposed development area. Also study shows that there will not be any significant impacts on subtidal habitats, since the expansion in within the already existing port basin.

There will not be any impact on fisheries/ marine aquatic life. No mangroves are observed in the development area. There will not be any significant impact on the flora and fauna including benthos and planktons. The impact on turtle is ruled out since this stretch of the coastline experience very rare sporadic nesting. It has been proposed to conserve the sporadic nesting of turtles in association with Puducherry Forest Department and/or Student Sea Turtle Conservation Network (SSTCN). The project will not hamper any migratory birds passing through the project region.

This proposed development of construction of LNG Terminal is only the expansion of existing operating port within the port basin. All activities are restricted within Port area and hence will not have any noticeable impact on the environment.

Clarification (C4):

d) Prediction of ground level concentration for the emission from turbine/boiler of FSRU ship.

The tankers/ Ships which call at any sea port are registered with the Classification Society and are governed by the same. They are therefore bound by the International Maritime Organisation (IMO) Ship Pollution Rules contained in "International Convention on the Prevention of Pollution from the Ships, 1973" MARPOL 73/78. All guidelines/ Rules are followed by the Tankers/ Ships including the FSRU/ FSU. Regulation for the prevention of Air Pollution from the Ships will be applicable to all the ships and they are equipped with the International Air Pollution Prevention Certificate. MARPOL Annex VI will apply to all ships, fixed and floating drilling rigs and other platforms.

With stringent controls in place for the parameters such as the NOx, SOx, VOCs, emissions from the ship/ tankers it is not expected to create any significant problem in the vicinity of the FSRU/FSU.

The FSU /FSRU would be equipped with its own generator to produce power for its own use, but the terminal would still accept power from the state grid whenever required. The onboard capacity of 22 MW of power will be supplied for running the terminal by the captive gas generators which will operate on the boil off gas (natural gas) generated in the process. Power requirement during construction phase is estimated to be 2-3 MW and will be met from the State Electricity Grid or D.G. sets to be installed on-site. However, to meet emergency power requirements i.e. in case of captive power plant tripping etc. Emergency diesel generator of around 6 MW will be provided as backup and state grid will act as standby power supply. The emissions will also be lower due to the increased efficiency, and the possibility to operate 100% on gas. These require a High Voltage (3,3kV, 6,6kV or 11kV) power system as the installed electrical power is more than 10MW for all the systems.

In case of burning LNG as fuel in a power plant, the conditions favour formation of CO_2 along with CH_4 (unburnt), CO, N_2O, and NOx formation, and these

emissions tend to vary with the type of fuel and firing configuration. Overall, CH_4, CO, N_2O, and NOx emissions from combustion sources are many times lower than CO_2 emissions. SO_2 and particulate matters are not significantly present in the emission.

About 117 pounds of carbon dioxide are produced per million British thermal units (Btu) equivalent of natural gas compared to more than 200 pounds of CO_2 per million Btu of coal and more than 160 pounds per million Btu of distillate fuel oil. These clean burning properties have contributed to the increased use of natural gas for electricity generation and the increased use of natural gas as a transportation fuel for fleet vehicles. Further, Combined-cycle generation of LNG based power generation units generate electricity and capture normally wasted heat energy, using it to generate more electricity.

Combined-cycle generation units can be up to 60 percent energy efficient, whereas coal and oil generation units are typically only 30 to 35 percent efficient. Coal and fuel oil also release ash particles into the environment, substances that do not burn but instead are carried into the atmosphere and contribute to pollution. The combustion of natural gas, on the other hand, releases very small amounts of sulphur dioxide and nitrogen oxides, virtually no ash or particulate matter, and lower levels of carbon dioxide, carbon monoxide, and other reactive hydrocarbons.

Fossil Fuel Emission Levels – Pounds per Billion Btu of Energy Input (1 megawatt MW= = 3,412,141.16 btu per hour btu/h)			
Pollutant	Natural Gas	Oil	Coal
Carbon Dioxide	117,000	164,000	208,000
Carbon Monoxide	40	33	208
Nitrogen Oxides	92	448	457
Sulphur Dioxide	1	1,122	2,591
Particulates	7	84	2,744
Mercury	0.000	0.007	0.016
Source: EIA – Natural Gas Issues and Trends 1998			

The above data clearly establishes very significant reduction in pollution emission for use of natural gas as fuel in comparison with oil or coal to the power plants. Taking the power plant capacity of 22 MW, the estimated emissions based on the above data may be computed as

Emission Rates in gm/s from a 22 MW Plant

Pollutant	Natural Gas	Oil	Coal
Carbon Dioxide	1408.792	1974.717	2504.519
Carbon Monoxide	0.482	0.397	2.505
Nitrogen Oxides	1.108	5.394	5.503
Sulphur Dioxide	0.012	13.510	31.198
Particulates	0.084	1.011	33.040

These values for Natural gas are not expected to create any significant problem even in the vicinity of the FSRU/FSU/Onshore for a 22 MW captive power plant.

Clarification (C5):

e) A management plan to control temperature difference between intake water, and discharge shall be submitted along with possible impacts and managed strictly.

Seawater Intake

Intake Volume: The quantity of seawater required for vaporizing LNG is 710 m^3/hour. Intake location: Seawater intake consists of vertical pump mounted on the southern side of the port. The water depth at intake location will be 7.9 m CD.

Marine outfall

Outfall volume: The total volume of return cooling water that would be discharged into the sea is 6500 m^3/hour at 8° C and it will be mixed with 6500 m^3/hour of seawater at ambient temperature. The resulting water will have a temperature of 18 °C. The outfall diffuser will have the multi ports of 300 Nos. of 150 mm diameter placed along the south breakwater for a distance of 450 m. All the ports will be oriented 45° to the horizontal. Outfall location: The outfall diffuser will have the multiple ports of 300 Nos. of 150 mm diameter placed along the south breakwater for a distance of 450 m. The location coordinates with other details are given below.

Location	Geographical		UTM (WGS84-ZONE 44)	
	Latitude, N	Longitude, E	X (m)	Y (m)
Intake head				
Intake head Depth = 7.9 m)	10° 49'55"	79° 51'12"	374386	1197759
Outfall diffuser				
Outfall diffuser (450 m long from southern breakwater)	10°50'3"	79°51'30"	374920	1197979

CORMIX model: The CORMIX model is used to simulate the initial dilution in the near field region around the outfall. This model essentially solves a two dimensional (2D) time dependent diffusion equation in (x-z) plane to simulate the mixing in the nearfield. The basic equation describing the mixing is given by,

$$\frac{\partial C}{\partial t} + u\frac{\partial c}{\partial x} = k_x\frac{\partial^2 c}{\partial x^2} + k_z\frac{\partial^2 c}{\partial z^2}$$

C- Pollution concentration

Output:

X	Y	Z	S	BV	BH
10	0.00	1.78	43	2.01	499.27
20	0.00	2.56	61	4.01	498.58
30	0.00	3.33	75	6.01	497.93
40	0.00	4.11	86	8.01	497.32
50	0.00	4.50	96	9.00	496.74
60	0.00	4.50	100	9.00	496.20
70	0.00	4.50	110	9.00	495.68
80	0.00	4.50	120	9.00	495.19
90	0.00	4.50	125	9.00	494.73
100	0.00	4.50	130	9.00	494.30

Profile definitions:

X = X-axis points downstream
Y = Y-axis points to left
Z = Z-axis points upward
S = hydrodynamic average (bulk) dilution
BV = layer depth (vertically mixed)
BH = top-hat half-width, in horizontal plane normal to trajectory

Calculation

For X = 10 m

Dilution S= 43 times

Difference in Temperature (Δt) =10 ^{0}C

= Difference in Temperature/Dilution

= 10/4.3 = 2.3 ^{0}C

For X = 50 m

Dilution S= 96 times

Difference in Temperature (Δt) =10 ^{0}C

= Difference in Temperature/Dilution

= 10/9.6 = 1 ^{0}C

The CORMIX results shows that the deviation of 10^{0}C below the ambient temperature of the sea water at the outfall ports goes to 2 ^{0}C within 10 m distance below the ambient temperature from the outfall location and further it goes to 1 ^{0}C in 50 m distance below the ambient temperature. The low temperature region will be confined to a very small region, within 10 m from the outfall.

Clarification (C6):

f) The impact assessment shall also study the impact on the/of the dumping ground through dredging disposals.

Impacts assessment due to dredging and disposal

The development of LNG Terminal involves dredging of 14 $x10^6$ m^3. The seabed along dredging areas primarily consists of fine sand and silt. Identified dredging effects include (i) entrainment and removal of organisms, (ii) increased turbidity at the dredging site, (iii) organic matter enrichment, (iv) fish injury associated with exposure to suspended sediments, (v) decreased dissolved oxygen and (vi) fish behavioural effects due to the effects of noise. Increased turbidity can affect the filter feeding organisms, such as shellfish, through clogging and damaging feeding and breathing equipment (gills). Similarly, young fish can be damaged if suspended sediments become trapped in their gills and increased fatalities of young fish have been observed in heavily turbid water. Adult fishes are likely to move away from or avoid areas of high suspended solids, such as dredging sites, unless food supplies are increased as a result of increases in organic material. Increases in turbidity results in a decrease in the depth that light is able to penetrate the water column which may affect submerged seaweeds, sea grasses and phytoplankton, the major primary producer in the coastal waters. During all dredging operations, the removal of material from the seabed also removes the animals living on and in the sediments (benthic animals). With exception of some deep burrowing animals or mobile surface animals that may survive a dredging event through avoidance, dredging may initially result in the complete removal of animals from the excavation site.

The recovery of disturbed habitats following dredging ultimately, depends upon the nature of the new sediment at the dredge site, sources and types of re-colonizing animals and the extent of disturbance. In soft sediment environment

recovery of animal communities generally occurs relatively quickly and a more rapid recovery of communities has been observed. The studies conducted elsewhere indicate that the dredging impacts are relatively short term in areas of high sediment mobility. If any heavy metals are present beneath the seafloor, then they may get exposed during dredging and increase in the concentration level in the water column. The disposal of dredged material at improper locations may lead to pollution and undesired accumulation of pollutants, if any, in the biota. When the dredged material, are disposed of at sea they will have a blanketing and smothering effect on the benthic organisms in the immediate disposal site. This blanketing or smothering of benthic animals and plants, may cause stress, reduced rates of growth or reproduction and in the worse case the effects may be fatal.

However, in the present case, the dredged material has been proposed to be placed partly on shore as beach fill (1×10^6 m^3) and the rest of the sediments will be disposed at the designated offshore location arrived by the modelling study.

Addition of dredged material to the intertidal area for shore stabilization (also known as intertidal recharge/sand bank) can provide long-term benefits of environmental protection. The act of placing material over existing intertidal habitats can cause short-term impacts of disposal at sea (suspended sediments and smothering), bringing them into often more environmentally sensitive environments along the shore.

However, despite the short-term problems, intertidal recharge (beach nourishment) is often the only practical means of attempting to combat coastal erosion. Beach nourishment of intertidal habitats with dredged materials that are coarser than the present intertidal sediments, such as a mixture of sand, gravel and rock can be used to protect the coast from erosion. However, the use of coarse sediments to recharge intertidal areas changes their nature considerably in terms of sediment processes and animal and plant communities.

Mitigation: Karaikal Port has demarcated a dredge spoil disposal ground at 30 m water depth located at 14 km offshore. The demarcated dredge disposal area extends around 3500 m x 3500 m. Port is disposing the annual maintenance dredging of around 2.0 x 10^6 m^3/year in this disposal ground. The disposal is being planned at 16 nodal points and the barges would dispose the sediments at different nodes in a sequential order. The quantity of sediment dredged during the development of LNG terminal can be disposed in this existing disposal ground.

The quantity of dredged sediments is expected to be around 14 x 10^6 m^3 out of which 13 x 10^6 m^3 will be disposed off at the designated areas in the deep sea. If disposal has carried out according to the proposed configuration then the morphology of the seabed will not have any impact and also the benthic organisms will not get affected.

Minutes for 12th meeting of Expert Appraisal Committee (Infra-2) for Projects related to All ship breaking yard including ship breaking unit, Airport, Common Hazardous Waste Treatment, Storage and Disposal Facilities, Ports and Harbours, Aerial Ropeways, CETPs, Common Municipal Solid Waste Management Facility, Building/Construction Project, Townships and Area Development projects to be held on 26-28 December, 2016.

Monday, 26th December, 2016

12.1. Confirmation of Minutes of 11th EAC Meeting for Infra-2 held on **24-25November, 2016**

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Minutes of 11th EAC Meeting for Infra-2 held on 24-25November, 2016 were confirmed.

12.2. Consideration of Proposals

12.2.1	**Establishment of 6 nos. Material Ropeways for the construction of Chanju-III at Village Dantoi, Tehsil Churah, Distt. Chamba, Himachal Pradesh by M/s Himachal Pradesh Power Corporation Limited- TOR regarding** (10-82/2016-IA-III**)** (IA/HP/MIS/59995/2016) • The committee noted that the proposal is incomplete and hence cannot be considered. • Examination of site alternatives and reasons for selecting the site should be given. • The sensitivity Analysis for 15 kilometers on all sides of the project (because of being a linear project) needs to be provided. • It was decided to submit revised Form –I alongwith all details, which will be considered as a fresh application.
12.2.2	**Installation of 5 no. of Material Ropeways for the construction of DeothalChanju Project at Dehra Panchayat, Chaurah Tehsil of Distt. Chmaba, Himachal Pradesh by Himachal Pradesh Power Corporation Limited. - TOR regarding (10-83/2016-IA-II;**IA/HP/MIS/60011/2016) • The committee noted that the proposal is incomplete and hence cannot be considered. • Examination of site alternatives and reasons for selecting the site should be given. • The sensitivity Analysis for 15 kilometers on all sides of the project (because of being a linear project) needs to be provided. • It was decided to submit revised Form –I alongwith all details, which will be considered as a fresh application.
12.2.3	**Extension of Runway at Rajahmundry Airport at Village Madhurapudi, District East Godavari (Andhra Pradesh) by M/s Airports Authority of India – Environment Clearance reg.** (10-16/2016-IA-III; IA/AP/MIS/49113/2016) The project authorities and their consultant (M/s Vimta Labs Limited) gave a detailed presentation on the salient features of the project and proposed environmental protection measures to be undertaken as per Draft Terms of References (TORs) awarded during the 4th Meeting of the Expert Appraisal Committee (Infrastructure) held during 28th - 29th March, 2016 for preparation of EIA-EMP report. All the projects related to Airports are listed at 7(a) of

schedule of EIA Notification, 2006 covered under category 'A' and appraised at central level.

M/s Airports Authority of India has proposed for extension of runway at Rajahmundry Airport at Village Madhurapudi, District East Godavari (Andhra Pradesh) The existing airport is currently handling about 12airport is about 225 PAX/hr. To meet the growing demand of the traffic and to facilitate bigger aircrafts of A-321 type, it is proposed to extend the runway from 1749 m to 3165 m. The cost of project is Rs. 181.45 Crores.

It is reported that no eco-sensitive area is located within a distance of 10 km. Reserve Forest namely, Divancheruvu West RF (5.7 km, S) and Divancheruvu East RF (5.5 km, SE) are located within 10 km distance. Godavari river (4.9 km, SW) is flowing at a distance of 4.9 km. No forest land is involved in the proposed project.

Presently, the airport is situated on 366.46 acres of land. Government of Andhra Pradesh has allotted additional land to the extent of 857.09 acres to AAI at free of cost and free from all encumbrances for airport expansion work. The total land after runway extension will be 1223.55 acres. No R & R issues are involved. Entire compensation for land acquisition is being borne by Government Andhra Pradesh. Till date, government of Andhra Pradesh has given possession of 852.42 acres of land to AAI and the remaining 4.67 acres of Government land is yet to be given by Government of Andhra Pradesh. The total land after runway extension will be 1223.55 acres.

Extension of runway and strengthening and resurfacing of existing runway facilities are detailed below:

i. Extension of Runway towards RWY 05 by 1374 m and RWY 23 by 42 m suitable to cater for A-321 type of aircraft from 1749 m to 3165 m;
ii. Strengthening /Resurfacing of existing runway 05/23 suitable for A-321 type of aircrafts;
iii. Provision of turn pad at both ends of runway and with suitable strength for A- 321 type of aircrafts;
iv. Provision of pavement against blast erosion of dimension 60 m x 60 m at both ends of runway;
v. Provision of 7.5 m wide shoulders on both side of runway and shoulder strength to facilitate operation of A-321 type of aircraft;
vi. Provision of adequate fillets at all intersections as well as taxiways leading to the new apron. The critical aircraft to be considered for fillet design shall be A- 321 aircraft;
vii. Provision of runway markings;
viii. Storm water drainage and rain water harvesting works in operational area; and Leveling and grading for operational area.

Additionally, the PP informed the Committee that ambient air quality monitoring was carried out at 8 locations during 1st March 2016 to 31st May 2016 and submitted baseline data indicates that ranges of concentrations of PM10 (40.7 µg/m3 to 58.8 µg/m3), PM2.5 (29.4 µg/m3 to 39.7 µg/m3), SO2 (11.8 µg/m3 to 20.1ug/m3) and NOx (15.7 µg/m3 to 26.6 µg/m3) respectively. AAQ modelling study for point source emissions indicates that the maximum incremental GLCs after the proposed project would be 2.7 µg/m3, 28.8 µg/m3, 22.3 µg/m3 and 0.05 µg/m3, with respect to SO2, NOx, CO and PM. The resultant concentrations are within the NAAQS. Aircrafts shall be operated in accordance with ICAO/USEPA standards to ensure aircraft emissions are within specified standards; Allowing aircrafts with certified engines only to land and take-off, as far as possible; Shut down engines during idling and taxing; Single engine taxing and reduced taxing would be

effective in reducing emissions of HC and CO from aircrafts. During operation phase, fresh water requirement from ground water source will be increased from 80 m^3/day to 125 m^3/day after the extension project. Wastewater generation will be 60 m^3/day and treated in the STP. The treated wastewater from the STP will be reused/recycled for air conditioning, cooling water make-up and green belt development. During monsoon season run-off from construction site will be routed to a temporary sedimentation tank for settlement of suspended solids. Sprinkling of water in the construction area and restricting dust-generating activities. The construction equipment will be regularly serviced and lubricated. Equipment shall be designed to conform to noise levels prescribed by regulatory agencies. Flight scheduling will be properly done so that the sensitive timings are avoided. The sludge generated from the STP will be used as manure for greenbelt development. Used oil from the DG sets will be stored as per Hazardous Storage & Management Rules and will be given to APPCB authorized agencies. Being a part of green initiative Rajahmundry airport is proposing to install 1 MW solar power plant to handle the additional power load.

The Committee deliberated upon the issues raised during the Public Hearing / Public Consultation meeting conducted by the AP Pollution Control Board on 6th October 2016. The issues were raised regarding land acquisition; compensation paid to farmers; insufficient road width; to open high school; Madhurapudi village is facing drinking water problem; unemployment; etc. In response, PP informed that Compensation paid to farmers by Govt. of AP as per the procedure laid down in the Land Acquisition Act- 2013. As regard to employment opportunities, PP informed that AAI is providing opportunities to local people for employment as and when need arises. The proposed expansion will create ingenerating direct and indirect employment. The Committee noted that issues have satisfactorily been responded by the project proponent and incorporated in the final EIA-EMP report

After detailed deliberations, the Committee recommended the project for environmental clearance and stipulated the following specific conditions along with other environmental conditions while considering for accord of environmental clearance:

i. PP shall obtain clearance from DGCA and AAI for safety and project facilities.

ii. Construction site should be adequately barricaded before the construction begins.

iii. Soil and other construction materials should be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty material wet.

iv. The soil/construction materials carried by the vehicle should be covered by impervious sheeting to ensure that the dusty materials do not leak from the vehicle.

v. The excavation working area should be sprayed with water after operation so as to maintain the entire surface wet.

vi. Soil stockpile shall be managed in such a manner that dust emission and sediment runoff are minimised. Ensure that soil stockpiles are designed with no slope greater than 2:1 (horizontal/vertical). Top soil shall be separately stored and used in the development of green belt.

vii. A detailed drainage plan for rain water shall be drawn up and implemented.

viii. Noise from vehicles and power machinery and equipment on-site should not exceed the prescribed limit. Equipment should be regularly serviced. Attention should also be given to muffler maintenance and enclosure of noisy equipments.

ix. Where construction activity is likely to cause noise nuisance to nearby residents, restrict operation hours between 7 am to 6 pm.

	x.	Solid inert waste found on construction sites consists of building rubble, demolition material, concrete, bricks, timber, plastic, glass, metals, bitumen etc shall be reused/recycled or disposed off as per solid waste management rule, 2016.
	xi.	Diesel power generating sets proposed as source of back up power for elevators and common area illumination during operation phase should be of enclosed type and conform to rules made under the Environment (Protection) Act, 1986. The height of stack of DG sets should be equal to the height needed for the combined capacity of all proposed DG sets. Use of low sulphur diesel. The location of the DG sets may be decided with in consultation with State Pollution Control Board.
	xii.	Aircraft maintenance, sensitivity of the location where activities are undertaken, and control of runoff of potential contaminants, chemicals etc shall be properly implemented and reported.
	xiii.	Proper drainage systems, emergency containment in the event of a major spill during monsoon season etc shall be provided.
	xiv.	The run off from paved structures like Runways, Taxiways, can be routed through drains to oil separation tanks and sedimentation basins before being discharged into rainwater harvesting structures.
	xv.	Storm water drains are to be built for discharging storm water from the air-field to avoid flooding/water logging in project area during monsoon season / cloud bursts.
	xvi.	Rain water harvesting for roof run- off and surface run- off, as plan submitted should be implemented. Before recharging the surface run off, pre-treatment must be done to remove suspended matter, oil and grease.
	xvii.	Total fresh water requirement from ground water source shall not exceed 125 m^3/day. Prior permission from CGWA shall be obtained.
	xviii.	Wastewater generation shall not exceed 60 KLD and treated in the STP. Treated sewage shall be recycled/reused for cooling tower make up, flushing and horticulture.
	xix.	Acoustic enclosures for DG sets, noise barriers for ground- run bays, ear plugs for operating personnel shall be implemented as mitigation measures for noise impact due to ground sources.
	xx.	During airport operation period, noise should be controlled to ensure that it does not exceed the prescribed standards. During night time the noise levels measured at the boundary of the building shall be restricted to the permissible levels to comply with the prevalent regulations.
	xxi.	The solid wastes shall be segregated as per the norms of the municipal solid waste management and Handling rules. Recycling of wastes such as paper, glass (produced from terminals and aircraft caterers), metal (at aircraft maintenance site), plastics (from aircrafts, terminals and offices), wood, waste oil and solvents (from maintenance and engineering operations), kitchen wastes and vegetable oils (from caterers) shall be carried out.
	xxii.	Traffic congestion near the entry and exit points from the roads adjoining the Airport shall be avoided. Parking should be fully internalized and no public space should be utilized.
	xxiii.	Energy conservation measures like installation of LED/CFLs/TFLs for the lighting the areas outside the building should be integral part of the project design and should be in place before project commissioning. Used CFLs and TFLs should be properly collected and disposed off/sent for recycling as per the prevailing guidelines/ rules of the regulatory authority to avoid mercury contamination. As proposed, one megawatt solar

	power generation facility shall be created. xxiv. An onsite disaster management plan shall be drawn up to account for risks and accidents. This onsite plan shall be dovetailed with the onsite management plan for the district.
12.2.4	**Development of Bulk Liquid Berth for handling LNG at Karaikal Port, Puducherry by *M/s* Karaikal Port Private Ltd.– Environment Clearance reg.** (11-41/2013-IA.III; IA/PY/MIS/19327/2013) The project authorities and their consultant (Indomer Coastal Hydraulics (P) Ltd.) gave a detailed presentation on the salient features of the project and proposed environmental protection measures to be undertaken as per Draft Terms of References (TORs) awarded during the 127th Meeting of the Expert Appraisal Committee (Infrastructure) held during 29th October 2013 for preparation of EIA-EMP report. All the projects related to Ports and Harbour i.e. ≥5 million TPA of cargo handling capacity (excluding fishing harbours) are listed at 7 (e) of schedule of EIA Notification, 2006 covered under category 'A' and appraised at central level. *M/s* Karaikal Port Private Ltd. has proposed for development of Bulk Liquid Berth for handling LNG at Karaikal Port, Puducherry. *At present the port is capable of handling 21.5 MTPA of various cargoes like Coal, General Cargoes,Containers, Crude oil, Edible oil, Project cargoes etc. The details of the existing facilities are as given below:* (a) *Two breakwaters one on the north side and another on the south side.* (b) *Five operational berths (2 cape size and 2 Panamax size berths and 1 OSV).* *(c) Approach channel with a dredged depth of (-) 16.5 m CD and Berths with a dredged depth of(-) 15.5 m CD.* *(d) Open cargo storage area of about 6,50,000 m2.* *(e) Covered area for cargo storage about 63,000 m2 (Warehouses).* *(f) Three numbers of dedicated railways siding within port premises and connected to main railway line between Nagore and Karaikal.* *(g) Internal roads and Road connectivity to NH 45A & NH 67.* *(h) Adequate tugs, mooring boats and navigational aids.* *(i) Adequate Fire fighting capabilities.* *(j) Adequate Pollution Control & Monitoring systems Proposed Bulk liquid berth for handling LNG.* The present proposal involves the development of Bulk Liquid Berth for handling LNG through Floating Storage Regasification Unit (FSRU)/Floating storage unit (FSU) with LNG vessel berthedalongside and connected to the shore by means of an approach jetty. Cost of project is Rs. 2610 Crore. The design capacity of the proposed LNG terminal will be up to 5 MMTPA (Million Tonne per Annum) with appropriate operational flexibility up to maximum 6 MMTPA. The proposed LNG terminal project will consist of the combination or only of FSUs/FSRUs/Onshore development of following facilities.

	It is proposed to maintain a depth of (-) 19.0 m CD alongside of the berth. LNG upto 5 MMTPA can be handled at this berth facility. Provision of Buffer LNG storage tanks within the port also comes under the proposed project. The LNG line from the port will be directly connected to the GAIL network which is within 4 km proximity of the port. For the development of LNG Terminal at Karaikal Port, the site was selected at the southern side of the port, after considering three locations within the port, i.e. Southern side of the port, Northern side of the port and Outer harbour. A terminal option analysis. Following facilities will be developed: **Breakwaters:** There are two breakwaters, one on the northern side and the other on the southern side. The proposed Liquid berth for handling will be setup along the south breakwater. **Berths:** A Bulk Liquid Berth will be developed for handling LNG through FSRU/FSU with LNG vessel berthed alongside and connected to the shore by means of an approach jetty. *Turning circle:* The diameter of the turning circle from the present 500 m and the depth of (-) 15.5 m CD will be increased to 600 m and (-) 19.0 m CD for the development of bulk liquid berth. **Approach channel***:* For the proposed LNG terminal requirement the length of the approach channel will be 11000 m, the inner and outer channel will be dredged to a depth of (-) 19.0 m CD and (-) 19.8 m CD respectively. The width of the approach channel will be 260 m. Power generation for the FSU includes three 22-MW gas turbines with SCR for the control of NOx emissions and waste heat recovery units (WHRUs); this system will come as part of the FSU. It is reported that the water is well oxygenated, nutrient rich and biologically productive at primary and secondary levels. The sub-tidal benthic fauna is moderately rich in diversity and numbers compare to the Inter tidal benthic fauna. The marine flora and fauna also indicate the existence of diverse population. The area is rich in both pelagic and demersal fisheries. The presence of mangroves at open beach is absent and they are sparsely present inside the river mouth. The study on various oceanographic parameters and the information on adjacent region indicate that the coastal water relatively clean and moderately productive. The flare stack will comprise five flares and one spare flare. The stack will be a steel structure and stand upto a maximum 100 m height. The average rate of seawater intake into and discharge from this system based on annual water usage would be approximately 14,900 m^3/day; the majority of the seawater would be used in the ballast system.To fulfil the present water requirement of about 100 KLD is being sourced from the existing RO plant while the development has permission for Desalination plant of capacity 300 KLD; the capacity will be enhanced over a period in stages to 2 MLD. New STP of 50 KLD will be provided to treat the additional sewage. Waste will be generated during operation phase due to additional ships coming into harbour (100 kg/d). The Channel will be deepen to (-) 19.8 m and the amount of dredge generated will be about 14 x 106 m 3 of which 13.0 x 106 m 3will be dumped at approved dumping site, while the balance 1.0 x 106 m 3will be used for reclamation/beach nourishment. The berth area would be dredged up to (-) 15.5 m. The dredging quantity is estimated as 14 x 106 m 3 . Out of which, 1.0 x 106 m 3 is proposed for the backup area and the rest will be disposed off in the MoEFCC designated disposal point in the deep sea. The dumping sites approved by MoEF vide letter No.10-2/2006-IA-III dtd.

	15.10.08 are Lat. 10°52.8' N Long. 80° 0.5' E, Lat. 10°50.4' N Long. 80° 0.5' E and Lat. 10°48.0' N Long. 80° 0.5' E. and shall be used as per the conditions specified in the letter. The total volume of r e t u r n cooling water that would be discharged into the sea is 6500 m3 /hour with 8° C and it will be mixed with 6500 m3 /hour of seawater with ambient temperature. The resultant water will have a temperature of 18 °C. The outfall diffuser will have the multi ports of 300 nos.x 150 mm diameter placed along the south breakwater for a distance of 450 m. All the ports will be oriented 45° to the horizontal. Puducherry Coastal Zone Management Authority vide letter no. 448/DSTE/PCZMA/NOC/SCI/2016/519 dated 3.10.2016 has recommended the proposal for MoEF&CC for consideration of CRZ clearance. It is also reported that as per CRZ map duly demarcation of HTL CRZ Boundary etc. prepare by the Institute of Remote Sensing, Anna University, the proposed activities falls within CRZ – III and CRZ IV Categories. *The Committee deliberated upon the issues raised during the Public Hearing / Public Consultation meeting conducted by the PCC, Pondicherry on 26.10.2016.*The concerns were raised regarding greenbelt, risk assessment, local employment, existing port related issues etc. After detailed deliberation, the Committee sought following additional information: (a) Copy of certified compliance report issued by the Regional Office, Chennai/Bangalore on the environmental condition stipulated in the existing EC. *(b)* As per EIA report, *cargo handling capacity of the existing Port is mentioned as 21.5 TPA and some place it is mentioned as 32 MTPA. Pl. clarify.* (c) The project proponents were advised to prepare a detailed biodiversity impact assessment report and management plan through the NIOS or any other institute of repute on marine, brackish water and fresh water ecology and biodiversity. The report shall study the impact on the rivers, estuary and the sea and include the intertidal biotopes, corals and coral communities, molluscs, sea grasses, sea weeds, subtidal habitats, fishes, other marine and aquatic micro, macro and mega flora and fauna including benthos, plankton, turtles , birds etc. as also the productivity. The data collection and impact assessment shall be as per standard survey methods. (d) Prediction of ground level concentration for the emissions from turbine/boiler of FSRU Ship. (e) A management plan to control temperature differences between intake water, and discharge shall be submitted along with possible impacts and managed strictly. (f) The impact assessment shall also study the impact on the/ of the dumping ground through dredging disposals. The proposal was deferred till the desired information is submitted. The above information shall be provided with the uploading of minutes on the website.
12.2.5	**Development of Jharsuguda Airport for A- 320 Operations, Jharsuguda, Odisha by M/s Airport Authority of India – Environment Clearance reg. (IA/OR/MIS/25791/2014; 10-28/2014-IA-III)** The project authorities and their consultant (M/s Vimta Labs Limited) gave a detailed