



Kamarajar Port Limited

ENVIRONMENTAL
MANAGEMENT
PLAN

1.0 INTRODUCTION

Kamarajar Port is the 12th and the only Corporate Major port under Ministry of Ports, Shipping and Waterways, Government of India.

Development of Ennore Coal Port Project (ECP) was completed at a cost of Rs.1058.52 Crores and commissioned in June 2001 with two Coal Berths viz. Coal Berth-1(CB-1) and Coal Berth (CB-2) to handle thermal coal for the Thermal Power Stations of Tamil Nadu. Subsequently, the port was gradually developed into a multi cargo port to cater the needs of the country. Earlier the port was functioning in the name of “Ennore Port Limited (EPL)” which was later renamed as “Kamarajar Port Limited (KPL)” in the year 2012.

The following are the details of various terminals and the operators functioning inside port.

S. No	Name of the berth/terminal	Details of Environment Clearance	Name of the BOT operator	Capacity & cargo handled	Details of CTO
1	Coal Berths (CB1&2)	J-16011/9/87-IA.III dated 28.09.1992	Kamarajar Port Limited	16 MMTPA Coal	The consent was valid till March 31, 2020. KPL had submitted the application for renewal of consent on 28.09.2020.
2	Marine Liquid Terminal	F.NO.10-28/2005-IA-III dated 19.05.2006	M/s Ennore Tank Terminals Pvt Ltd.(ETTPL)	3 MMTPA, POL products	Consent No. 2108130939881 dated 01.02.2021. valid upto 31.03.2022
3	Common user Coal Terminal	-do-	M/s. Ennore Coal Terminal Private Limited (M/s. Chettinad International Coal Terminal Private Limited).	8 MMTA Coal	Consent No. 170828137869 dated 30.3.2017. valid upto 31.03.2022
4	Iron ore berth	(Initial environmental clearance F.NO.10-28/2005-IA-III	M/s. SICAL Iron Ore Pvt.Ltd	12 MMTPA	Consent To Establish – Consent order No. 1801210272073 dated 20.7.2018.

		dated 19.05.2006). MoEF&CC vide letter No. 10-28/2005-IA.III dated 09.05.2018 had accorded clearance for Modification of the terminal on “as is where is” basis to handle common user coal.			Valid upto March 31, 2025.
5	General Cargo Berth	11-21/2009-IA.III dated 23.07.2009	Kamarajar Port Limited	2 lakh cars and 0.5 Million Tons of General cargo	The consent was valid till March 31, 2020. KPL had submitted the application for renewal of consent on 28.09.2020.
6	Additional Coal Berths (CB3&4)	11-51/2012-IA.III dated 12.03.2015	KPL	18 MMTPA Coal	Consent order No.15062355540 dated 31.08.2015. Valid till August 30 2022.
7	Multi cargo berth	10-28/2005-IA.III dated 24.12.2014	M/s. Ennore Bulk Terminal Private Limited (M/s. Chettinad International Bulk Terminal)	2 MMTPA Cargoes like steel, baggage cargo,	Consent order No.180811243850 9 dated 20.09.2018. Valid till March 31,2023.
8	Container Terminal	-do-	M/s. Adani Ennore Container Terminal Pvt.Ltd.	11.8 MMTPA Containers	Consent order No.180811167658 1 dated 23.08.2018. Valid till March 31, 2021. AECTPL has applied to TNPCB for renewal of Consent To Operate on 14.02.2021.

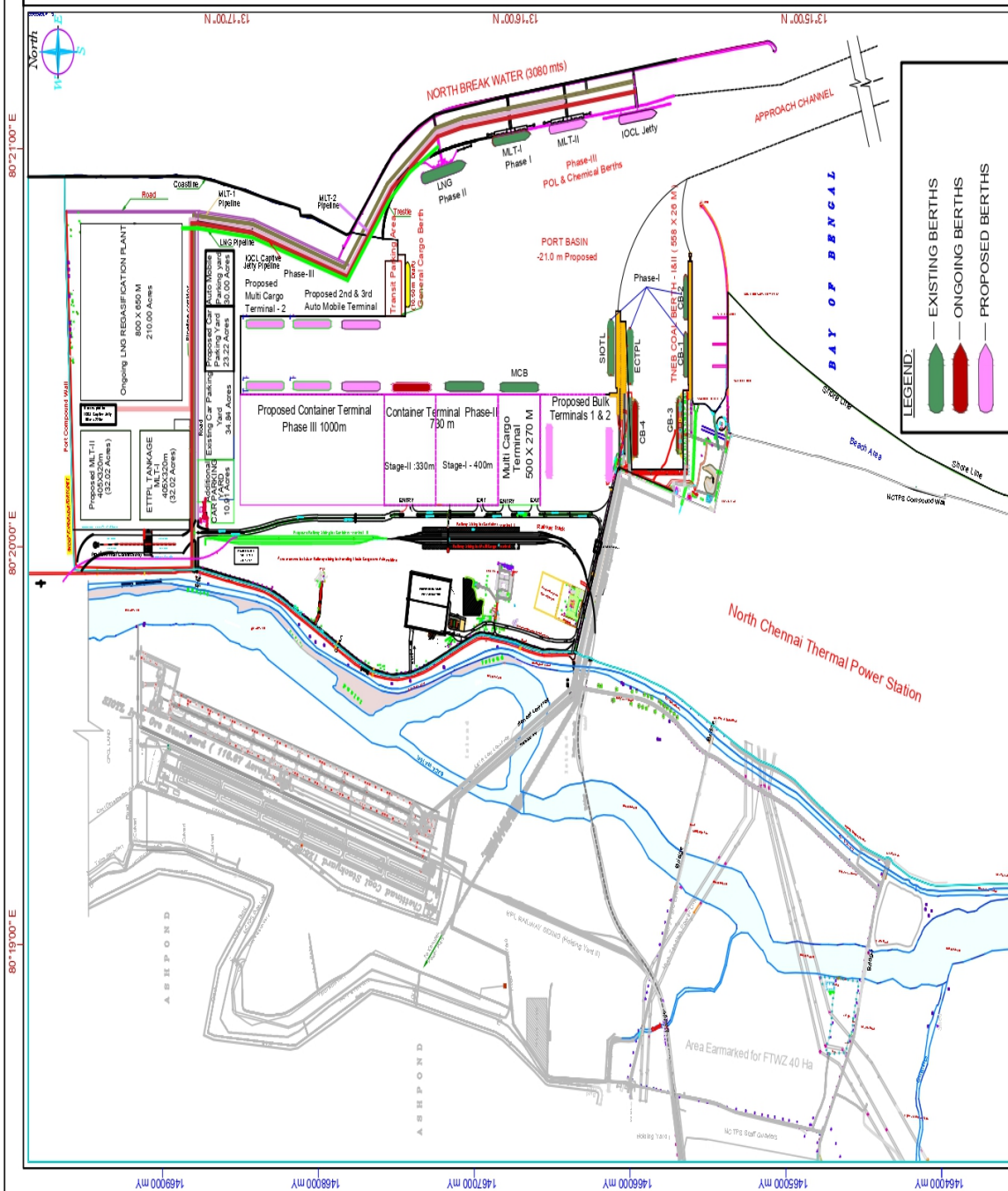
Due to increase in the demand of cargo and in order to effectively make use of the facilities already created, KPL proposed to develop the following projects as envisaged in the Kamarajar Port master plan phase III. The projects will be developed in a phased manner in line with the market requirements, well within the boundary of the existing break waters (Port Basin) and in the lands owned by Kamarajar Port. MoEF&CC had accorded Environment and CRZ clearance vide letter dated F.No.11-51/2012-IA.III dated 30.10.2018.

S.No	Name of the berth/terminal	Details of Environment Clearance	Name of the BOT operator	Capacity	Details of CTO
9	Automobile export/import terminal-(2Berths)	11-51/2012-IA.III dated 30.10.2018	Kamarajar Port Limited	6 MMTPA	KPL had submitted the application to obtain CTE on 20.4.2021 and the same is under process.
10	Container terminal -1000m quay length(3berths)	-do-	---	24 MMTPA	---
11	Marine Liquid Terminal	-do-	---	5 MMTPA	---
12	IOC captive jetty	-do-	M/s. Indian Oil Corporation Limited	5 MTPA	Consent order No. 2101231814699 dated 10.04.2021. Valid till March 31, 2026.
13	Bulk terminal (coal/ore/other type-2Berths)	-do-	---	18 MMTPA	---
14	Multi cargo berth	-do-	---	2 MMTPA	---

MASTER PLAN OF THE PORT:

The port master plan showing all the existing, ongoing and upcoming projects, infrastructure facilities available, break waters shown in the port master plan drawing as below.

MASTER PLAN OF KAMARAJAR PORT LIMITED, ENNORE



Terminal/Berth	Capacity in MMTPA
Coal Berths 1 & 2	16
Coal Berths 3 & 4 (yet to commission)	18
ECTPL (Ennore Coal Terminal Pvt Ltd)	8
EBTPL (Ennore Bulk Terminal Pvt Ltd)	2
SIOTL (Sical Iron Ore Terminal)	12
MLT (Marine Liquid Terminal)	3
GCB (General Cargo Berth)	2.0 lakh cars / annum and 0.5MT project cargo
AECTPL (Adani Container Terminal)	16.8
LNG Terminal)	5
Container Terminal-1000m length - 3berths)	24
MLT-II (Marine Liquid Terminal)	5
IOCL captive Jetty	5
MCB-II (Multi Cargo Berth)	2
Bulk Terminals - 2berths	18
Automobile Export/Import Terminal - 2berths	6
Total Capacity	142 MMTPA

2.0 ENVIRONMENTAL MANAGEMENT AT PORT

Port's Environmental Management Plan (EMP) is aimed at mitigating the possible adverse impacts of projects and for ensuring maintenance of the existing environmental quality. Keeping in view of the various impacts during the operation of the terminals/berths in order to mitigate the adverse effects, the following Environmental Management Plans are being implemented.

2.1 CARGO HANDLED AT PORT

The major cargo handled at KPL is coal for the Tamil Nadu Electricity Board (TNEB). Besides coal, the other cargoes handled at KPL are petroleum products such as chemicals, LPG, LNG, bulk Cargoes and import/export of brand new automobiles.

2.1.1 COAL

At present coal is handled at port in the following two berths:

- (i) Coal berths 1 & 2 (CB1&CB2) and
- (ii) Ennore Coal Terminals Private Limited [ECTPL] (Erstwhile M/s Chettinad International Coal Terminal Pvt. Ltd)

(i) COAL BERTHS 1 & 2 (CB1 & CB2)

Coal is handled in these two berths dedicated exclusively for North Chennai Thermal Power Station (TNEB). Shore based unloading equipments such as grab unloaders and mobile hoppers are installed for unloading the coal from the ship and fed to the conveyor through hopper. The coal is transported through elevated closed conveyor system till it is unloaded at the power plant. No trucks are engaged to transport coal from the port.





Coal unloaded from the ship and put into hopper



Closed elevated conveyor system



Closed elevated conveyor system

No coal is stored inside the port. In addition to the covered conveyor system, water sprinklers have been provided in the hoppers for suppression of coal dust emanating while discharging coal from the vessels.

Cleaning of the operational area/jetty after every unloading operation to prevent piling up of material, if any is done.

(ii) ENNORE COAL TERMINAL PRIVATE LIMITED (FORMERLY CHETTINAD INTERNATIONAL COAL TERMINAL PVT. LTD.

Kamarajar Port (KPL) has awarded licence to M/s. Chettinad International coal Terminal Pvt. Ltd., (CICTPL), a BOT operator for coal unloading facilities. The handling capacity of the terminal is 8 Million Tons of coal per annum (8 MTPA).

The Environmental mitigation measures implemented during operation period consists of air quality, water quality, sea water quality, noise control and safety management.

STANDARD FACILITIES AVAILABLE AT CHETTINAD INTERNATIONAL COAL TERMINAL PVT. LTD., OF ENNORE PORT.

SHIP UN-LOADER

CICTPL is having two nos. of grab type Ship un-loader to handle 80,000DWT Vessel at the rate of 3500MT/hour. This ship un-loader is used for transfer of coal from ship to stack yard directly. The Stack yard is located at a distance of 4km from the berth in non habitation area. Since the cargo is not discharged in the wharf / berth directly, therefore it does not have any impact on the marine ecology.

The dusty cargo is discharged from the Ship through un-loader hopper and transferred to the stack yard via closed conveyor system. This machine is having high efficient water sprinkling system, dust wall and spill plate to mitigate the air pollution at discharge end in the ship un-loader.

The swing telescopic chutes are provided at the wagon loading system to reduce drop height, this prevents spillage and flying of minute dust particles into atmosphere. The terminal is also equipped with Programmable Logic Controller (PLC) to keep levels below the brim.

CLOSED CONVEYOR

The entire conveyor system is fully covered with galvalume sheets and translucent sheet at regular intervals. In addition to the above, the conveyor system is provided with deck sheet at the bottom of the conveyor wherever necessary. Hence there is no chance of spillage/dust dispersion during coal conveying in the conveyor.



CLOSED TRANSFER TOWERS

All the conveyor transfer towers are fully closed with galvalume sheets. In this transfer tower, high efficiency water spraying systems are provided, hence there is no chance of dust emission during the coal transfer from one conveyor to another. In addition to the spraying system, the dusty coal discharge point and receiving points are fully covered with deck sheets.

The terminal is adopted air pollution control measures.



STACK YARD

The Stack Yard is located 4km away from the berth in a non habitation area. The discharged coal from ship is directly unloaded at Stack yard through closed conveyor and Stacker cum re-claimer. The Stack yard is having high efficiency water sprinkler system to mitigate the air pollution. The total length of the conveyor upto the stack yard is approx.3000m.



WIND SHIELD AT STACK YARD

In addition to the above, at stack yard wind shield has been installed in the predominant wind direction to prevent air pollution.



GREEN BELT AND COMPOUND WALL AT STACK YARD

The entire stack yard is protected with high rise compound wall of sufficient height made up of RCC column and brick masonry and the entire stack pile area is covered with 3 rows of plantations.



CATCH PITS AND SETTLING POND

The stack yard is provided with saucer drain and 2 nos. of catch pits. These catch pits are connected with settling pond through leading channels. These catch pits / leading channel and settling pond are constructed using geo-synthetic membrane sheet and cement concrete to avoid any percolation of effluent in to the ground and any nearby water bodies during the rainy season.

The entire ETP water is re-circulated, no discharge of any effluent is taking place and zero liquid discharge system is being followed by the terminal. Effluents are properly allowed to settle at the settling pond and the superannuated liquid is drawn through water tanker and it is used on to the road for mitigating the dust emission.





STACKER CUM RECLAIMER

Facility of two nos. of stacker cum re-claimer is provided for stacking and reclaiming to avoid multiple handling, spillage and air pollution. This machine is designed for fast discharge and reclaiming. During its operation it does not create dust emission. Since the equipment is having an in built dust suppression system. This machine ensures that there is no discharge at shoreline/berth/wharf and thus protects the marine eco system.



AUTOMATIC WAGON LOADING SYSTEM

The reclaimed coal is transferred to the wagon through fully closed conveyors, automatic wagon loading system to avoid any multiple handling, spillage and air pollution. The system comprises of dust suppression system at transfer points to mitigate the air pollution.

The swing telescopic chutes are provided at the wagon loading system to reduce drop height, this prevents spillage and flying of minute dust particles into atmosphere. The terminal is also equipped with Programmable Logic Controller (PLC) to keep levels below the brim



COAL END USER

The end users are power plants, steel plants, cement manufacturers, agro product manufacturers etc.

ENVIRONMENTAL CONTROL MEASURES

- ❖ Dust Suppression System with water Sprinkler at every point of Coal Transfer. (Ship un-loaders, Transfer Towers and Stacker cum Re-Claimer)
- ❖ Spill plates in Ship Un-loader.
- ❖ Dust wall protection arrangements in Ship un-loader hopper.
- ❖ Closed conveyor system.
- ❖ Closed Transfer Towers
- ❖ Dust Suppression system at Coal stack yard.
- ❖ Fire Fighting System.
- ❖ Stack Yard, Catch Pit, Settling Pond are lined with Geo-Synthetic membrane to avoid water percolation.
- ❖ Coal Stack Yard is protected by High raised compound wall
- ❖ Saucer drain – Catch Pit- Settling Pond to collect excess water.
- ❖ Daily Sweeping of roads and Berth by using Mechanical Dust Sucker machine (Sweeper).
- ❖ Wetting the road by water to avoid dust emission.
- ❖ Effective operation of STP & ETP.
- ❖ Ensuring “ZERO DISCHARGE” of Effluents.

2.1.2 PETROLEUM OIL LUBRICANTS

Port handles petroleum products and other chemicals through Marine Liquid Terminal operated by one of the BOT operator M/s. Ennore Tank Terminals Pvt. Ltd. The capacity of the terminal is 3 MMTPA.

There are 64 storage tanks of various sizes, ranging from 860 KL to 12,300 KL suitable for all kinds of liquid products. The storage terminal is equipped for both import and export operations. The tanks are constructed as per API-650 standards. The Tank Terminal is licensed by the Chief Controller of Explosives for storing Class A/B/C products. Fire protection system is in place as per OISD norms.

In Marine Liquid Terminal a small portion (only at road crossing, around 360 meters) of pipe line is laid underground. Apart from that all other lines are above ground only. The dock lines are piggable and all dock lines are kept empty after discharge operations. The terminal is also equipped with temperature and pressure gauges on both sides (jetty and terminal) and also carry out line patrolling continuously during vessel discharge operations. The terminal operator also monitors the hourly vessel discharge rate in ship/shore side, as a precautionary measure.

The cargo from the ship is transferred through pipelines of various diameters of 24, 16, 12, 8 & 16 inches to the shore tanks. A dedicated cryogenic pipeline is there for propane and butane. All pipelines are piggable. The products are transported through dedicated pipelines from the berth to the tank farms which are partly underground. Therefore there is no chance of spillage during the transportation of POL products.

2.1.3 MULTI CARGO

Bulk cargoes are handled in this berth by one of the BOT operator M/s. Ennore Bulk Terminals Private Limited. The capacity of the terminal is 2 MMTPA. Only clean cargo like granite, timber logs, grains, bagged cargoes including sugar and steel cargoes are handled. The cargo is unloaded from the ship and stored inside a closed shed before despatching outside through trucks.

2.1.4 GENERAL CARGO

In the General Cargo Berth, brand new automobiles are handled. The capacity of the terminal is 2 lakhs car per year and 0.5 MMTPA of project cargo. The automobiles are directly taken into the car carriers. No emissions are released.

2.1.5 CONTAINERS

Containers are handled at one of the berths operated by M/s. Adani Ennore Container Private Limited (AECTPL). The capacity of the terminal is 11.8 MMTPA.

3.0 ENVIRONMENTAL MONITORING & MANAGEMENT

The Environmental cell is part of HSE division and is headed by an officer in the rank of Chief Manager. At present, the Environment Cell is comprising of the following officers.

Chief Manager (HSE)

Sr. Manager (HSE)

Jr. Executive (AHO).

However, our management is in the process of expanding the environmental cell. The respective BOT terminals/operators are having their own Environment monitoring cell.

Port and the terminal operators are continuously monitoring the environment. Port has engaged a MoEF and NABL accredited laboratory M/s. Hubert Enviro Care Systems Private Limited for sampling and testing of various environmental parameters like ambient air quality, marine water quality, ground water, sediment quality and noise levels. All the monitored parameters are found to be well within the standards.

The monthly environmental quality reports are submitted to the office of District Environmental Engineer, Gumudipoondi and the office of Member Secretary, Tamil Nadu Pollution Control Board(TNPCB). The comprehensive environmental compliance report is forwarded to the Regional Office of the Ministry of Environment & Forests, Bangalore once in six months.

Tamil Nadu Pollution Control Board (TNPCB) Laboratory also conducts yearly ambient air quality survey inside port at various locations of all the terminals.

Environmental Parameters Monitored

The following parameters are monitored.

1. Ambient Air Quality

- Particulate Matter₁₀, Particulate Matter _{2.5},
- Sulphur Oxide, Nitrous Oxide, Carbon Monoxide.

2. Marine Water Quality & Surface water quality

- Temperature, pH, Salinity, Dissolved Oxygen (DO) and Total dissolved solids (TDS), BOD, Heavy metals (Cadmium, lead, mercury, arsenic, zinc & Copper), Petroleum Hydro carbon (PHC).
- Phytoplankton, zooplankton and benthos.

3. Sediment quality

- Sediment particle size analysis , Total organic and inorganic carbon, Heavy metals - Mercury, Lead, Copper, Cadmium and Arsenic.

The various BOT operators like M/s. Ennore Tank Terminals Pvt Ltd, M/s. Ennore Coal Terminal Private Limited, M/s. Adani Ennore Container Terminals Private Limited are also monitoring the environmental quality in their premises and they are submitting the reports regularly to TNPCB.

LOCATION OF MONITORING/SAMPLING STATIONS

1. AMBIENT AIR QUALITY

Ambient air quality is being monitored at the following locations. The sampling location and station code is as mentioned below. The map showing sampling station is shown at Annexure VI.

Port has installed three nos of Continuous Ambient Air Quality Monitoring Stations (CAAQMS) at the various locations of the port. These stations are connected to the TNPCB CARE. Port is in the process of enhancing the number of continuous air quality monitoring stations and will be operational within a period of six months.

Further, Port has engaged a NABL accredited laboratory to monitor the various environmental parameters including Ambient Air. The locations of the ambient air quality monitoring stations were as per the Environment Management and Monitoring Plan (EMMP) through National Centre for Coastal Management (NCSCM), Anna University, a unit of MoEF&CC. TNPCB also monitors in the said locations during annual survey.

1. Security Main Gate (AQ1)
2. Inside port administrative building (AQ2)
3. Signal Station (AQ3)
4. Finger jetty (AQ4)
5. At Car parking yard (AQ5)
6. At General Cargo Berth (AQ6)
7. At west gate (AQ7)
8. Guest house (AQ8)



Monitoring stations for Air Quality

2. SEDIMENT QUALITY

The following parameters is being tested for sediment quality.

1. Sediment particle size analysis
2. Total organic and inorganic carbon
3. Heavy metals - Mercury, Lead, Copper, Cadmium and Arsenic

3. SURFACE WATER QUALITY

The sampling and testing of surface water comprises of the following parameters.

1. Water temperature
2. pH
3. Salinity
4. Conductivity
5. Turbidity
6. Suspended particulate matter (SPM)
7. Dissolved Oxygen (DO) and O₂ saturation
8. Total dissolved solids (TDS)
9. BOD
10. COD
11. Nitrite
12. Nitrate
13. Total nitrogen
14. Ammonia
15. Inorganic phosphate
16. Total phosphorus
17. Sulphate
18. Total & dissolved iron
19. Heavy metals (Cadmium, lead, mercury, arsenic, zinc & Copper)
20. Petroleum Hydro carbon (PHC)

4. MARINE WATER QUALITY

The Marine water quality is being monitored at the following locations. The sampling location and station code is as mentioned below.

1. Near Finger Jetty (A)
2. Near Marine Liquid Terminal (MLT) (B)
3. Near General Cargo berth (GCB) (C)
4. Other three locations D, E & F. The locations A, B, C are within the port break waters and the locations D, E & F are in the open ocean outside the break waters.

Sediment shall be sampled at the following locations.

1. Near Finger Jetty (A)
2. Near Marine Liquid Terminal (MLT) (B)
3. Near General Cargo berth (GCB) (C)
4. Creek mouth (CR1)



Locations for Marine and Surface Water Quality

GROUND WATER QUALITY:

Presently, Port is not monitoring ground water. The parameters for monitoring are identified based on the Environmental Monitoring and Management Plan prepared through National Centre for Sustainable Coastal Management. However, as advised by TNPCB, Port will monitor the ground water to monitor the oil & grease levels in the ground water.

ENVIRONMENTAL QUALITY:

The ambient air quality data carried out by Kamarajar port (KPL) during the period 2017-18 to 2020-21 (till April'21) is furnished as **Annexure-I**.

The ambient air quality monitored by TNPCB laboratory at the Coal Berths (CB1&2), GCB during the years 2018, 2019, 2020 and 2021 is enclosed as **Annexure-II**. The ambient air quality monitored by TNPCB laboratory at ETTPL, AECTPL, ECTPL (CICTPL) & EBTL (CIBTPL) during the period 2016-2019 are enclosed as **Annexure-IV**. The results of analysis revealed that the air quality parameters are found to be well within limits.

The marine water quality for the period September 2019 to March 2021 is enclosed herewith as **Annexure-V**.

The test results reveal all the parameters are found to be well within limits for the years 2017-18, 2018-19 & 2020-21 (till April). Port is continuously striving to improve the ambient air quality by enhancing the control measures from time to time.

4.0 OIL SPILL RESPONSE FACILITIES AT KAMARAJAR PORT LIMITED (KPL)

In order to keep the marine water free from pollutants/oil spills within the Port limits, Kamarajar Port Limited had procured Oil Spill Response (OSR) equipment in 2016.

KPL has a dedicated Oil Spill Response team for regular monitoring of the marine water, oil spill response operations and maintaining oil spill response equipment.

Vessels berthed at Kamarajar Port Limited are being garlanded by booms to prevent the spread of oil spills (if any) that occurs.

KPL has Oil Spill Contingency Plan in place. The Tier-1 Oil Spill Response Equipment available with Kamarajar Port Limited as furnished below are as per NOS DCP guidelines:

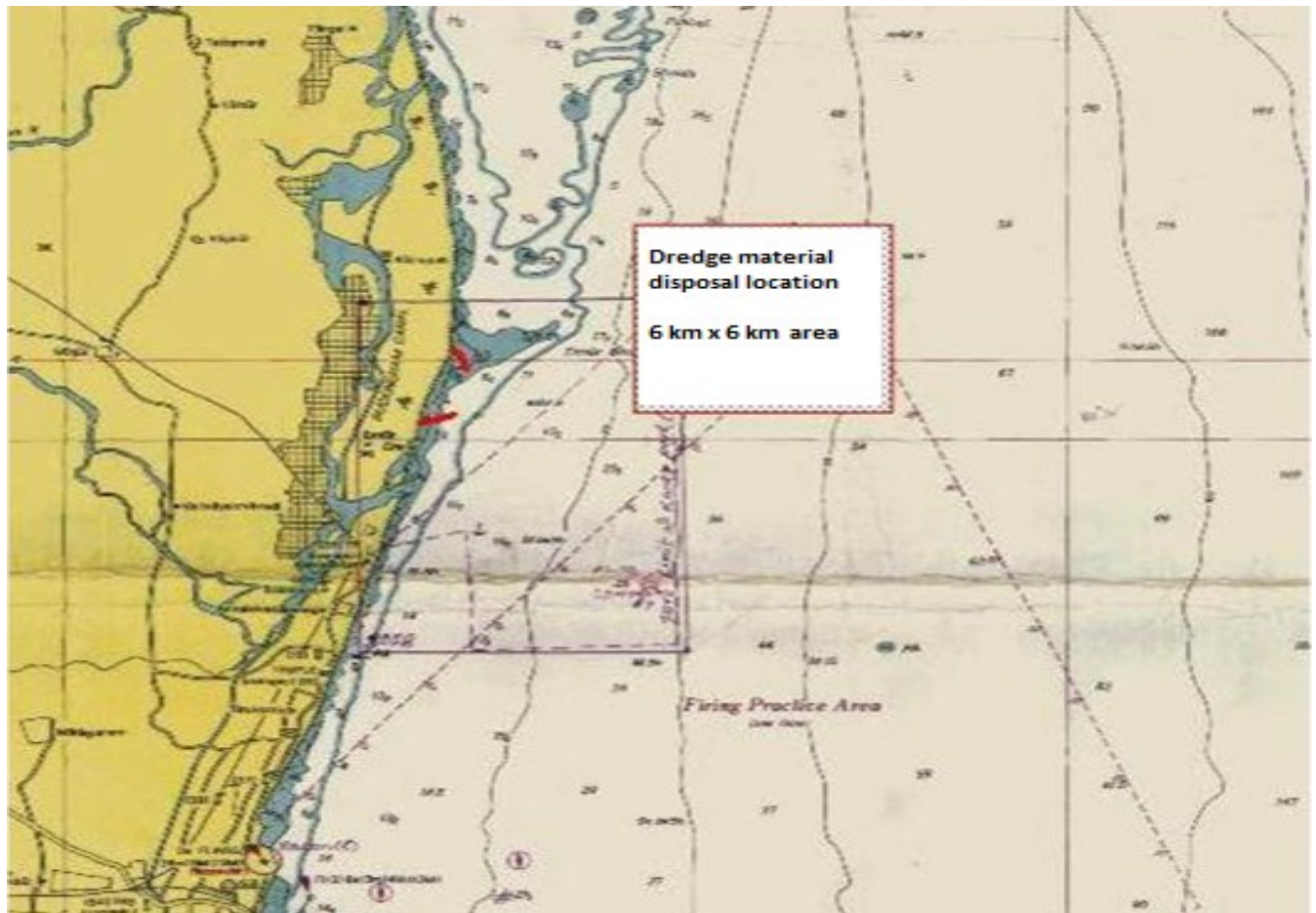
S No	Description	Quantity
1	Boom (Internal Rectangular type Foam Filled Boom) Including 4nos of Boom Reel)	1000 m (40 Sec.)
	Boom Repair Kit for Boom	2 Sets
2	Skimmer (Recovery capacity ranging from 20 to 25 TPH).	4 Pcs
	Equivalent Power pack for Skimmer. Equivalent Valve and Spark Arrestor Set	4 Pcs
3	Sorbent Boom Pack Sorbent Pads (1.4 x 1.3 feet (+/- 0.2), 25 pieces	50 pieces (5inc dia X 10 feet length) (each pack

	in a box)	contain 5 pieces) 35 Boxes
4	Flex Barge (Floating Oil Bladder LFT) (5 KL) including 2sets Repair Kit for Flex Barge.	4 Nos.
5	Oil Spill Dispersant concentrate - Type II &III	4500 L
6	Container of 20 feet to store OSR equipments	4 No.
7	IMO Level 1	8 persons
8	IMO Level 2	3 persons
9	IMO Level 3	1 person
10	Others	11 persons (7 from berth side and 4 from craft side)
11	Work boats	2 Launch
12	Tugs	2 Tugs
13	Self Contained Breathing Apparatus	2 No's

5.0 DREDGING AND DREDGE MATERIAL DISPOSAL

All ports require both Capital Dredging (one time process involving removal of virgin material from the sea bed to create, or deepen a shipping channel in order to serve ships. This includes dredging activity inside and outside the ports or harbors and channels) and Maintenance dredging (the periodic removal of shoals or sediments from existing navigational channels, berths, swinging moorings etc. in order to maintain an appropriate safe depth of water for navigation, construction or operational purposes). KPL carries out both Capital and Maintenance dredging. The dredged material obtained from both Capital and Maintenance Dredging are disposed at the designated area in the sea about 6 Nautical Miles(NM) from the tip of the North Break water. The disposal site was identified based on mathematical model studies by National Institute of Ocean Technolog (NIOT), Chennai during the year 2004.

Subsequently, the model was recalibrated for the disposal of 30 Million m³ of dredged spoil over the period of 5 years. The disposal is suggested at 16 nodal points covering an area of 6000 m x 6000 m in diagonal sequence. It is suggested that the dredge spoil barges may dispose the sediments at different locations in the disposal area in a sequential order. The modelling study indicates the change in seabed to an insignificant level by 0.26 m. However, in subsequent years, due to waves and currents, the dumped sediments will move from disposal location and spread further towards east. The seabed is expected to reach its original level in 5 year after the completion of disposal.



Off shore disposal location for dredged material

5.1 MONITORING OF THE ENVIRONMENT DURING DREDGING.

Monitoring of the environment will be carried out before start of the dredging during the dredging and after completion of the dredging operations. KPL / dredging contractor will engage a MoEF&CC recognized laboratory for carrying out sampling and testing of various environmental parameters during the dredging period.

KPL is informing and obtaining the clearance before commencement of dredging activities. KPL vide letter No. KPL/MS/Env/D-Ph IVA/2020 dated 11.02.2020 had informed and sought permission from TNPCB for the proposed Phase IVA dredging. TNPCB vide letter No. T1/TNPCB/F.0044/PORT/GMP/2020 dated 14.02.2020 had accorded permission for the same.

The baseline survey was carried out during the period 17.07.2020 to 20.08.2020 (pre dredge survey). The Phase-IVA dredging commenced on 20.07.2020 and likely completed by 31.07.2020. After completion, post dredge survey will be carried out to assess the difference in levels if any. The monitoring of sea water and sediment is being carried out during the dredging the operations.

5.1.1 BASELINE ENVIRONMENT

Baseline data defines the present quality of the environment at the site before the start of the dredging operations. The following parameters will be monitored.

Physical parameters:

pH

Turbidity (NTU)

Salinity

Total Suspended Solids

Chemical parameters;

Dissolved oxygen

BOD 5

Oil & Grease

Chlorides

Sulphates

Total nitrogen

Nitrate Nitrogen

Total phosphate

Heavy metals in water & sediments

Iron (Fe)

Zinc (Zn)

Lead (Pb)

Cadmium (Cd)

Mercury (Hg)

Copper (Cu)

Biological parameters

Phytoplankton

Zooplanktons

5.1.2 MONITORING DURING DREDGING

During dredging, the above parameters will be monitored. Sampling will be carried out once in 15 days. Sampling will be carried out near the dredging operations, at the channel entrance and at the dumping location during the dredging operations.

6.0 PORT RECEPTION FACILITIES

The International Convention for the Prevention of Pollution from Ships (MARPOL) is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes. In accordance with MARPOL 73/78, the ports have to provide reception facilities for the ships calling at their ports to discharge their wastes. KPL has facilitated reception facilities for the following.

Annex I—Regulations for the Prevention of Pollution by Oil

KPL has formulated a policy for the disposal of oily wastes generated from the ships.

KPL had empanelled three TNPCB approved oil recyclers as per 'Waste Oil, Sewage & Other Waste Reception Facilities Policy-2019' for collection and disposal of oily wastes from the ships. The details of the recyclers are available in KPL website and also uploaded in the "Swachh Sagar" portal of Director General-Shipping.

The following three recyclers are empanelled.

S.No	Name of the recycler	Details Hazardous Waste Authorisation
1	M/s. Supreme Petro Products, No 9, Eguvarpalayam village-I, Gummidipoondi Taluk, Thiruvallur district, Chennai, TamilNadu – 601 201	Hazardous Waste Authorisation by TNPCB T2/TNPCB/7122/HWM/13-14/RS/TLR/2016 dated 29.03.2016. valid upto 28.03.2021. The firm has submitted application to TNPCB for renewal of authorisation.
2	M/s. P.M.B & CO, S.F. No. 95/4, THIRUPANIKARISALKULAM Village, TIRUNELVELI, TamilNadu- 627004	Hazardous Waste Authorisation by TNPCB 17HAD5635615 dated 19.04.2017 valid till 18.04.2022
3	M/s. Tirupathi Oil Company Plot No.7, Sidco Industrial Estate, Venmaniathur village, Tindivanam- 604207.	Hazardous Waste Authorisation by TNPCB 18HRC12111693 dated 17.05.2018 valid till 16.05.2023

As per the policy, Tamil Nadu Pollution Control Board (TNPCB) /Central Pollution Control Board (CPCB) approved recyclers will directly receive the oil wastes/sludge facilities on the request of the ships as well as the agents and transport it to their recycling facility centre, by following the due procedures like customs clearance, submission of manifest (Form-10), copy of the endorsement made by the Master of the vessel for the quantity disposed, in the pass book.

The Master of the vessel endorses the quantity of oily wastes disposed from the ships in the “Registration Certificate-cum-Pass Book for Re-refining/Recycling of Hazardous Wastes” book of the recyclers. KPL keep record of the copy of the endorsement made in the above pass book.

Port has obtained authorization under Hazardous Wastes from Tamil Nadu Pollution Control Board vide authorization No. 19HFC15860702 dated 30.04.2019 for generation, collection, storage, reception, disposal to authorised recyclers. The authorisation is valid for a period upto 29/04/2024. Kamarajar Port is submitting the returns regularly to TNPCB. The last annual returns were submitted for the year 2020-21 on 07.06.2021.

Port is having a dedicated reception facility inside port premises for receiving and disposal of oily sludge from the ships if desired. A dedicated slop tank of 1177 KL capacity is available at Marine Liquid handling terminal operated by M/s. Ennore Tank Terminals Pvt. Ltd., which can be utilised in the event of any requirement.

Kamarajar Port submits the Manifest (Form-10) for the Hazardous Waste to TNPCB.

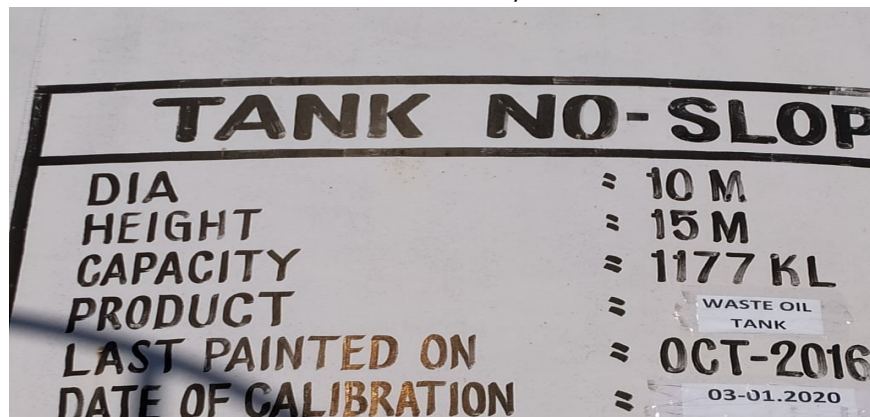
Annex II- Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk.

M/s. Ennore Tank Terminal, one of the BOT operators is handling the Noxious Liquid Substances (NLS) at their terminal. The details of the NLS handled are as below.

S.No	List of Noxious substance	Tank Details	Capacity (MT)	Current level (MT)	Storage requirement
1	Acetone	Tank no – 202 409 417	1582 860 860	927 634 99	Above ground, mild steel tank
2	Butyl acrylate	Tank no – 204 413	2035 860	1560 221	Above ground, mild steel tank
3	Toluene	Tank no – 207 208 402 406	2596 1577 1188 1181	595 200 158 916	Above ground, mild steel tank

4	Hexane	Tank no – 209 403 407 412	1176 862 855 1181	571 500 523 221	Above ground, mild steel tank
6	Acetic acid	Tank no – 510	1550	615	Above ground, stainless steel tank
7	Propylene oxide	Tank no – 801	5033	1134	Above ground, low pressure doom roof tank
8	Methyl methacrylate	Tank no – 416	1179	335	Above ground, mild steel tank

The terminal has installed one slop tank of capacity 1178 KL for storage of Noxious Liquid Substances, if any received from ships. This facility can be utilised for storage of Noxious Liquid substances from other terminals / berths also.





Dedicated Tanks (slop tank-1 & slop tank-2) inside M/s. Ennore Tank Terminals Private Limited for storage of Oily wastes and Noxious Liquid Substances.

Annex III Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form:

Kamarajar port does not handle harmful substances in packaged form.

Annex-IV - Regulations for the prevention of pollution by sewage

Kamarajar port is having Port Waste Oil & Sewage Disposal Policy-2019” for the disposal of ship generated sewage.

M/s. Adani Ennore Container Terminal Private Limited and (AECTPL) have installed STP of 25 KLD capacity during 2017-18 as per the TNPCB CTE order and is operating continuously adhering to CTO order conditions. The entire domestic effluent generated is treated in STP and the treated sewage effluent is meeting the standards that are prescribed by the TNPC Board. The treated sewage water is 100% used for Greenbelt maintenance.

M/s. Ennore Bulk Terminals Private Limited is also having sewage treatment plant of 20 KLD capacity inside KPL port premises;



25 KLD STP at M/s. Adani Ennore Container Terminal Private Limited



The above STPs are common sewage treatment plants can be utilised for any demand by the ships for disposal of sewage from any of the terminals inside KPL. However, so far there is no demand from the ships for the disposal of the sewage.

The technical detail of the sewage treatment plant is as follows.

S.No	Name of the treatment unit	No. of units	Dimensions in meters
1.	Bar screen pit	1	0.3 x 1.5 x 0.3
2.	Oil & Grease Trap	1	1.0 x 1.5 x 1.2
3.	Equalization Tank	1	1.5 x 1.5 x 3
4.	Fluidized Aerobic Bed Reactors Tank	2	0.9 m dia x 2.5 m
5.	Tube Settler Tank	1	1.2 x 1.2 x 2.5
6.	Chlorine contact tank	1	1.6 x 0.8 x 1.0
7.	Filter feed tank	1	1.6 x 0.8 x 0.9
8.	Sludge Digester tank	1	2.5 x 2.5 x 3.0
9.	Treated water tank	1	10 KL
10.	Sludge drying bed	2	2.5 x 2.5

The treated effluent is further treated with 0.15% of Sodium Hypochlorite and the water is used for gardening purpose.



20 KLD STP at M/s. Ennore Bulk Terminal Private Limited

Further, port is in the process of enhancing the facility by addition of two more STP's of capacity 10KLD and 20KLD, which includes reception of sewage from ships also. This way port will have 75 KLD capacity Sewage Treatment Plants (STPs).

Directorate General of Shipping through Mercantile Marine Department inspects the ships for adequacy of sewage treatment facility onboard.

Ships calling at the port are not discharging any sewage into the sea within the port limits. The Masters of the vessel will be asked to seal the sewage disposal line of the ships before entering the port waters to avoid the disposal of treated/untreated sewage in the port limits.

Annex- V –Prevention of pollution by Garbage from Ships

For the disposal of garbage, Port has engaged a contractor through open tender for the collection and disposal of garbage from the ships. The collected wastes are segregated into different categories like plastics, metals, wood, packing material etc., and sent to the approved recyclers/industries for further beneficial use. Port has made it mandatory for the ships calling the port for cargo operations to dispose waste upon berthing. To implement this, an amount for minimum quantity of 1 cu.m of solid waste is charged to the ships upon berthing. Port collects this amount from the ship agents. It is duty of the contractor to get the endorsement from the Master of the ship for the quantity of waste discharged.

No hazardous wastes are collected. The collected garbage is brought into a dedicated shed for segregation. The garbage is not stored for longer periods and the same is disposed off to authorised recyclers/industries as early as possible.

With regard to the food waste, an organic waste converter is installed inside the port for the treatment and disposal of food waste. The quantity of garbage wastes collected from the ships and other sources upto March 2021 are listed as below:

Year	Land (in cu.M)	Ship(in cu.M)
2019	1293	3930
2020	1174	2237
2021 (upto March 2021)	299	692

The segregated wastes are sent to the following industries:

1. M/s. Chennai Used Empty Drums and barrels Re-Conditioning Tiny Industries and Small scale traders Development Association. TNPCB Consent Order No. 1907127537116 dated 28.06.2019.
2. E- Wastes: i Seven e-waste Recyclers, Bangalore
3. Plastic bottles, cans: M/s. Abu Plastics, Madhavaram, Chennai
4. Excel Recycling, Karnataka.

Efforts being made to utilize the recyclers located within Tamilnadu for the waste disposal.

The leftover quantity of non hazardous un-segregated wastes is sent to Vellur Panchayat, Minjur Union. In this regard, Port has obtained permission to dispose the un-segregated solids wastes at Vellur Panchayat dumping yard. Garbage disposal record is being maintained by all the vessels. DG Shipping verifies the same during the port state inspection. Port is also maintaining the garbage record for each disposal from the ships calling at the port.

Annex VI Prevention of air pollution from ships like ships exhaust gas, including sulphur oxides (SO_x) and nitrous oxides (NO_x), and prohibits deliberate emissions of ozone depleting substances (ODS).

With regard to the prevention of air pollution from the ships, Directorate General Shipping (DGS), Govt., of India is the monitoring agency for compliance. DGS has issued a circular vide No.02/2019, Regulation-14 to 19, in accordance with the prevention of air pollution onboard the vessels.

Port verifies the validity of International Air Pollution Prevention (IAPP) certificate which states the compliance of applicable requirements of Annex-VI of the MARPOL convention.

An amendment was made to the Annex-VI wherein, the rule limits the sulphur in the fuel oil used on board ships operating outside designated emission control areas to 0.50% m/m (mass by mass) - a significant reduction from the previous limit of 3.5%. The rule came into force with effect from 1st March 2020. The bunker supplied to the ships is of 0.5% sulphur content.

The Marine Liquid Terminal had installed the VOC (Volatile Organic Compound) monitoring system in four places in our terminal i.e. four corners in terminal which is linked with control room and monitoring in 24 X 7.

- CH 01 – Admin building of Marine Liquid Terminal
- CH 02 – TLFS 3 security watch tower of Marine Liquid Terminal
- CH 03 – TLFS 7 security watch tower of Marine Liquid Terminal
- CH 04 – PO control room of Marine Liquid Terminal

7.0 GREEN BELT

Port has taken up a massive plantation for the development of green belt. The length of the green belt inside the port along the western boundary wall (S-N) is approximately of 1.5 km in length and the average width is about 150 m. The green belt acts as noise and dust barrier. A compound wall of 12 m height is provided all along the port periphery. This also acts as wind shield in preventing fugitive dust arise.

At present port is having a green belt of 636.14 which includes a green belt (planted) 210.74 acres, green cover natural (349.26) and mangroves in an area of 76.14 acres.

Apart from the above, KPL has appointed a consultant for “Preparation of Bio-Diversity Management Plan” for the port and the report along with the green belt development plan was submitted to Tamil Nadu State Bio-diversity Board vide KPL letter No. KPL/MS/HSE/BD/2019 dated 17.01.2020 for validation and approval. The biological expert committee from TNBB inspected the port premises and suggested certain modifications in the report. The same are incorporated and the revised report yet to submit to TNBB for validation and approval. As per the plan, port has proposed for the development of green belt of 68.66Acres inside the custom bound area and 621.91 Acres outside the custom bound area, totalling the future development of green belt area of 690.77 Acres. After getting the validation the same will be carried out in phase manner

8.0 BIODIVERSITY MANAGEMENT

KPL has engaged M/s L & T Infrastructure Engineering Limited, Hyderabad for the work of “Preparation of Bio-Diversity Management Plan for Kamarajar Port Limited”, *vide* work order No: KPL/MS/HSE/BD/2018, Dated: 27.03.2019. The draft report was submitted to Tamilnadu State Bio-diversity Board (TNBB) vide KPL letter No. KPL/MS/HSE/BD/2019 dated 17.01.2020 for validation and approval. The biological expert committee from TNBB inspected the port premises and suggested certain modifications in the report. The same are incorporated and the revised report yet to submit to TNBB for validation and approval. Upon approval of the Bio-Diversity Management Plan, the suggestions/conservancy plans will be implemented through TNBB and Tamilnadu Forest Department.

9.0 DESALINATION PLANT

The port is obtaining water of 250 KLD against the sanctioned quantity of 1000 KLD from Chennai Metro Water and Sewerage Board (CMWSB) for potable purpose. Further port has proposed to establish Reverse Osmosis based desalination plant of 1 Million Litre capacity per day. The proposed desalination process will make use of Reverse Osmosis (RO) technology to remove salt from sea water, thereby producing fresh water. KPL has submitted the application to obtain clearance under CRZ Notification 2011 for setting up the desalination plant. The proposal was placed before the District Coastal Zone Management Authority meeting held on 5.11.2020. The clearance is awaited.

10.0 RAINWATER HARVESTING SYSTEM

The Port has Rainwater Harvesting System in its Administrative Building. The details of the same are furnished as below:

Administrative Building consists of Open well with the following:-

- Submerged RCC ring of diameter 3'- 0" into a pit of 3 m depth.
- Filter chamber of size 0.6 x 0.6 x 0.9 m in brickwork CM 1:5.
- River sand to a depth of 0.15 m • Pebbles to a depth of 0.15 m
- Nylon mesh between river sand and Pebble stone.
- PVC pipes of 110 mm dia connecting terrace, well and filter chamber have been laid.