TAMIL NADU POLLUTION CONTROL BOARD

Report of the Technical Team on the oil spillage in Ennore Creek Area during the recent flood caused by Michaung cyclone

January 2024

Index

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1. Preamble

The unprecedented heavy rain on 3rd, 4th and 5th of December 2023 due to Michaung cyclone and the release of excess water from Poondi and Puzhal reservoirs caused severe flooding of several parts of Chennai including Manali and Ennore and inundated several residential and industrial areas. Based on the information received regarding oil spillage into Buckingham canal the Joint Chief Environmental Engineer (Monitoring) (JCEE (M)) Chennai inspected the area on 05/12/2023.During the inspection, the JCEE (M) found a layer of oil floating on the B' Canal from CPCL up to Ennore creek. The people of the villages on the bank of the B' canal in Ennore and near the Ennore creek complained about the flow of oil in B' Canal. The JCEE (M) collected sample of the water in Ennore creek area and sent them to the TNPCB laboratory for analyzing and finding the source and the amount of oil present in the water.

Stagnation of rain water inside M/s CPCL during recent flood

As the flood water started to recede on subsequent days, the oil deposition on the shrubs and trees in the canal and on the banks of the canal became visible. Fishermen in Ennore creek also complained about the presence of oil in Ennore creek and

deposition of oil on their boats/vessels. Hence the JCEE (M), Chennai along with District Environmental Engineer, Ambattur and the Assistant Environmental Engineer, Manali inspected the area again on 07/12/2023and further on 09/12/2023 and observed the following:

1. The Oil spillage stretches were found spread from the unit M/s. CPCL to Ennore creek uptoa distance of 11 km in Buckingham canal and in Kosasthalaiyar River in Ennore Creek area.
2. The residential area of Kattukuppam, Sathyamurthy Nagar, Nettukuppam, Thalakuppam, Sivan Padai Veedhi, Ennore Kuppam, Thazhan Kuppam, Mugathuvara Kuppam, Kargil Nagar mainly affected are all along the stretch of the Buckingham canal.
3. Mangroves in the Buckingham canal near Sivan Padai Veedhi and Kosasthalaiyar River both the banks were affected due to oil spillage.

The TNPCB officials also collected samples in the creek area of Nettukuppam and in B' Canal near Thazhankuppam village and sent them for analysis.

Collection of water sample near Ennore creek

As more complaints about the damages caused due to the oil deposition in the B' Canal water, its banks and in Ennore Creek, were received and as the Hon'ble NGT in its order dated 09.12.2023 has directed to take immediate steps to arrest the oil spread, the Government of Tamil Nadu decided to constitute a Technical Team to provide a detailed report on this incident to the Government.

2. Formation of Technical Team

The Environment, Climate Change and Forests Department, Government of Tamil Nadu constituted a Technical Teamvide G.O.(Ms) No.178 dated 10.12.2023 with the following Experts/officers to ascertain the cause of the oil spillage in the Ennore Creek area, assess the damage caused and to suggest remedial measures (Annexure I)

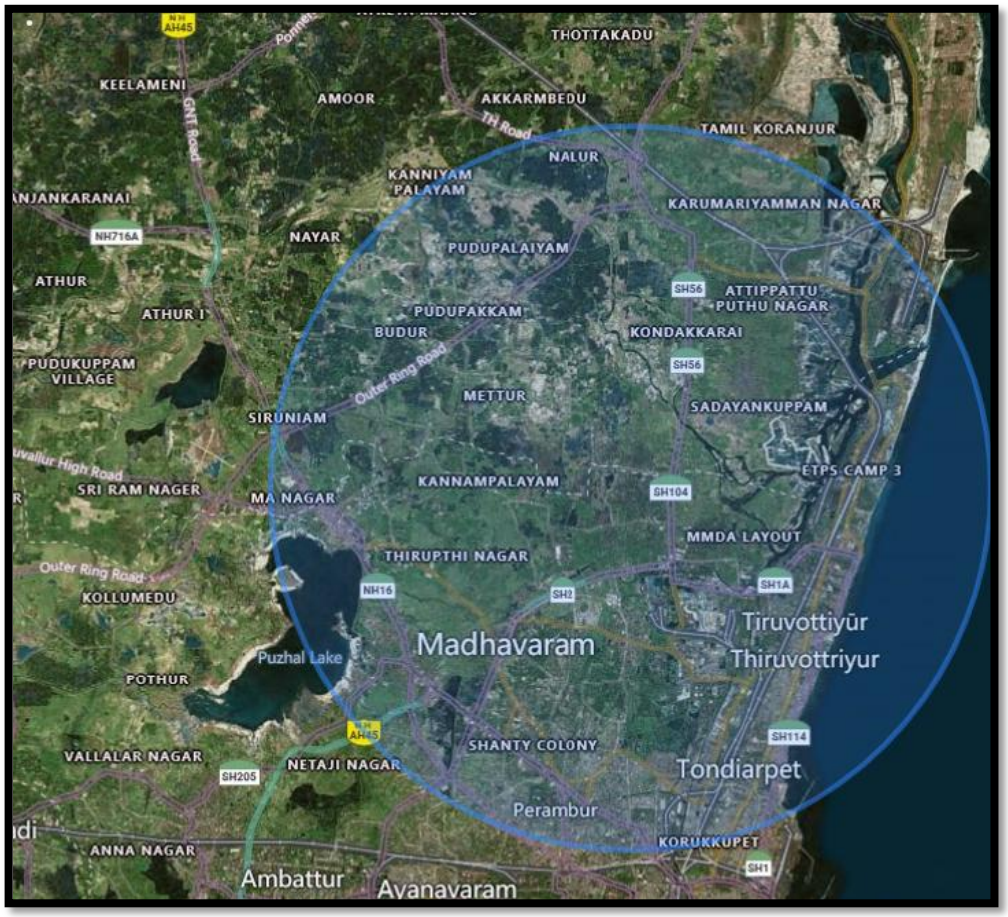
1	ThiruR.Kannan, Member Secretary, TNPCB	Chairman
2	Dr.G.Saravanan, Principal Scientist, Chennai Zonal Centre, CSIR, NEERI	Member
3	Ms. H.D.Varalaxmi, Scientist-E & Regional Director, Regional Directorate, Central Pollution Control Board, Chennai	Member
4	Thiru V. Kumar, Commandant, Indian Coast Guard	Member
5	Prof V.T.Perarasu, Department of Chemical Engineering, Anna University Chennai	Member

3. Geography of the Area

3.1 Manali– EnnoreIndustrial Complex

The Manali and Ennore industrial area, located along the Coromandel Coast north of Chennai, is a sprawling hub of economic activity. The Manali Industrial Complex is one of the largest petrochemical complexes in India and the only one in Tamil Nadu. This Petrochemical Complex is located at 13˚10'4" Northern latitude and 80˚15'43" eastern longitude and is about 20 km north of Chennai. This Industrial complex spreads over in the revenue villages of Manali, Chinnasekadu, Voiyakadu Sadayankuppam, Amulavoyal, Ennore and Eranvor of Tiruvottiyur Taluk, Chennai District of Tami Nadu. Just adjacent to this petrochemical complex is the Ennore

industrial area which houses thermal power plants, large scale chemical and fertiliser units making Manali – Ennore a complex industrial hub of Tamil Nadu. Manali-Ennore Industrial Complex is surrounded by Buckingham Canal & Tiruvottiyur village on the East, Chennai city on the South, Kossathaliyar River on the North and the villages of Manjambakkam, Mathur and Madavaram of Chennai District on the West. It is well connected by Ennore High Road and National Highway 5A. The Ennore port is located at 15 km and Thiruvottiyur Railway Station 3 km away.



Google map showing the villages and the water bodies in Manali – Ennore area

This industrial complex spread over 2000 hectares, it houses major players in the oil refining, petrochemicals, pharmaceuticals, Engineering and chemicals industries, driving Chennai's industrial engine. Manali Industrial Area is vital in India's petrochemical and energy sectors, supplying raw materials for various industries. The

zone contributes significantly to Chennai's and Tamil Nadu's GDP, with estimates ranging from 10% to 15%.

Major Industries located in this region are:

- Chennai Petroleum Corporation Limited (CPCL)
- Madras Fertilizers Limited (MFL)
- Manali Petrochemical Ltd (MPL)
- Tamil Nadu Petroproducts Limited (TPL)
- National Thermal Power Corporation Ltd
- Ashok Leyland
- L&T Shipbuilding
- Sriram Fibers Ltd (SRF)
- Cetex Petrochemicals,
- Supreme Petrochemicals
- Indian Additives Ltd
- Kothari Petrochemicals Ltd
- BalmerLawrie& Co
- KCP
- NatcoPharma
- Raj Petro
- Piramal Pharma
- Toshiba JSW Power Systems Private Limited
- MRF
- Carborundum Universal

The region has also numerous water bodies and macro drains, including Buckingham canal, Kosasthaliyar River, and Ammulavoyal channel. Despite having such large water bodies for effective flood drainage, the area is experiencing frequent flooding due to the lack of a drainage master plan for the region, encroachments and inadequate storm water drainage systems.

3.2 Chennai Petroleum Corporation Limited (CPCL)

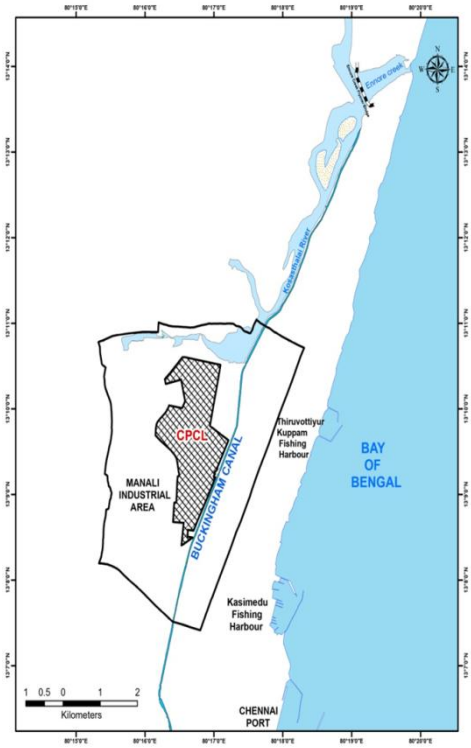
Chennai Petroleum Corporation Limited (CPCL) is a public sector unit, a group company of Indian Oil Corporation Ltd which is located at Manali Village, Tiruvottiyur Taluk, Chennai District and spread across an area of 832 acres. CPCL refinery commenced its production since1969. The unit is in the business of refining crude Petroleum Oil with total capacity of 10.5 MMTPA. The main products of the refinery are LPG, Motor Spirit, Superior Kerosene, Aviation Turbine Fuel, High Speed Diesel, Naphtha, Bitumen, Lube Base Stocks, Paraffin Wax, Fuel Oil, Hexane and Petrochemical feed stocks. This refinery plays a vital role of a mother industry supplying feed stocks to the neighbouring industries located in Manali, Chennai.

A view of CPCL refinery

CPCL has obtained consent valid upto 31.03.2024 for 9 plants out of which 6 plants are process plants, 2 are utility plants and one is crude pipeline plant. These plants include 3 Crude Oil Refineries, Diesel Hydro De-Sulphurization Unit, Resid Upgradation Project, Propylene, Butylene & Lube Expansion Plant, Hexane Plant, Gas

Turbine Generator Power Plant, Crude Pipeline Project & Tertiary Sewage Treatment Plant.

The trade effluent generated from the refining activities is treated in 3 nos of Effluent Treatment Plants with capacities of 300 KL/hr (2 nos) & 465 KL/hr which is further treated through RO. The treated effluent is partly recycled to boiler feed and balance treated effluent is stored in two Guard Ponds which is further used for fire water network, gardening and cooling tower make up. Further the unit has provided storm water collection ponds to collect the rain water and provision made for treat the same in ETP. Oil water separators are provided in the storm water collection ponds. The unit has installed 40 nos. of stacks at their process section, 6 nos. of stacks at boiler and 5 nos. of stacks at Gas Turbines. OCEMS connectivity has been established at 51 stacks for the pollutant parameters such as SO_2, NO_X, PM & CO to CAC, TNPCB and CPCB servers.

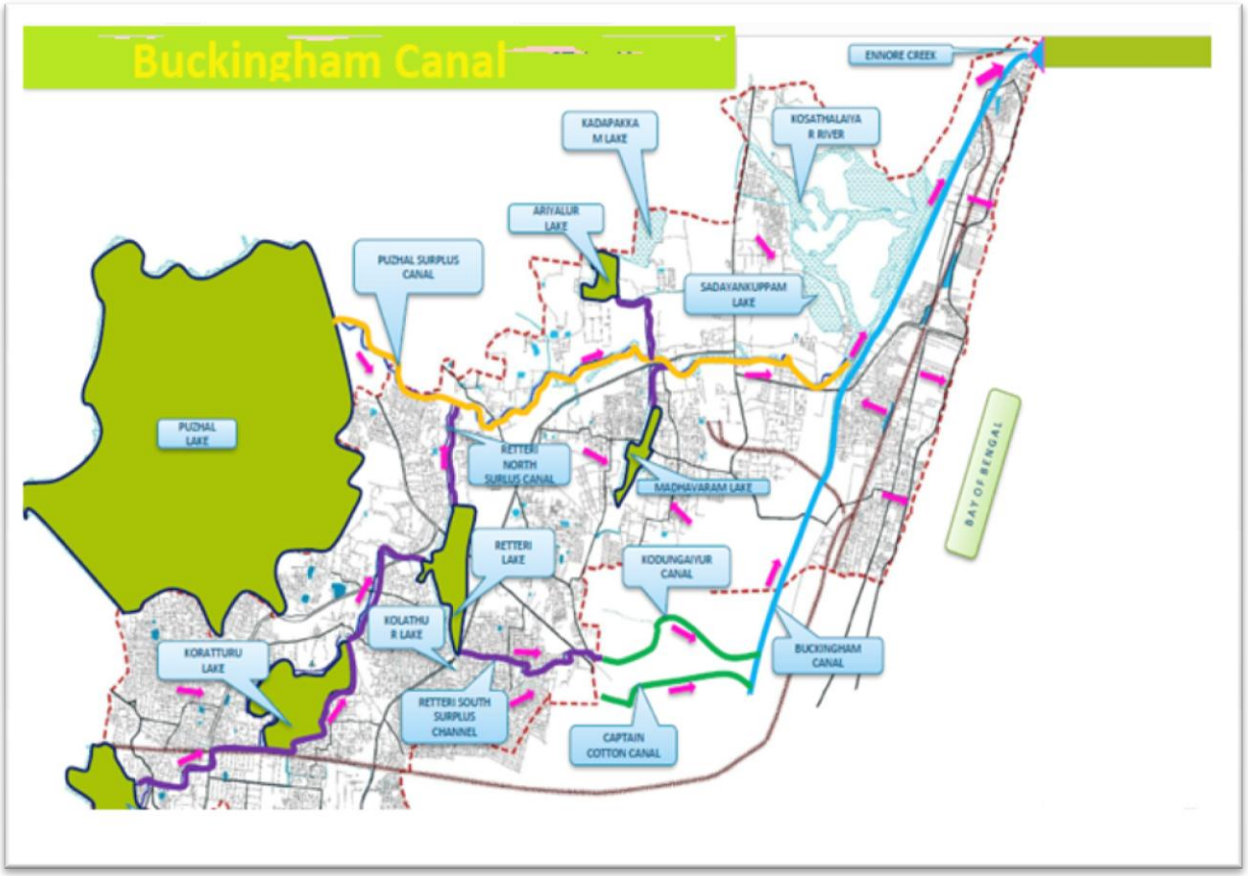


The location of CPCL in the Manali industrial area along side Buckingham Canal and Kosasthalaiyar River

3.3. Buckingham Canal

The Buckingham Canal is a historical waterway located in the city of Chennai, Tamil Nadu. It stands as a testament to the city's rich heritage and the vital role it played in fostering trade and transportation. The canal covers a considerable distance, serving as a significant aquatic artery, meandering through various parts of Chennai and connecting several water bodies.

In terms of geography, the canal originates at Ennore Creek, providing a link between the Pulicat Lake and the Adyar River. It passes through several neighborhoods of Chennai, such as Royapuram, George Town, and Mylapore, providing a scenic view of urban and suburban life along its banks. The canal's network extends up to the southern parts of the city, thereby enhancing connectivity and providing a historical perspective to the urban landscape.

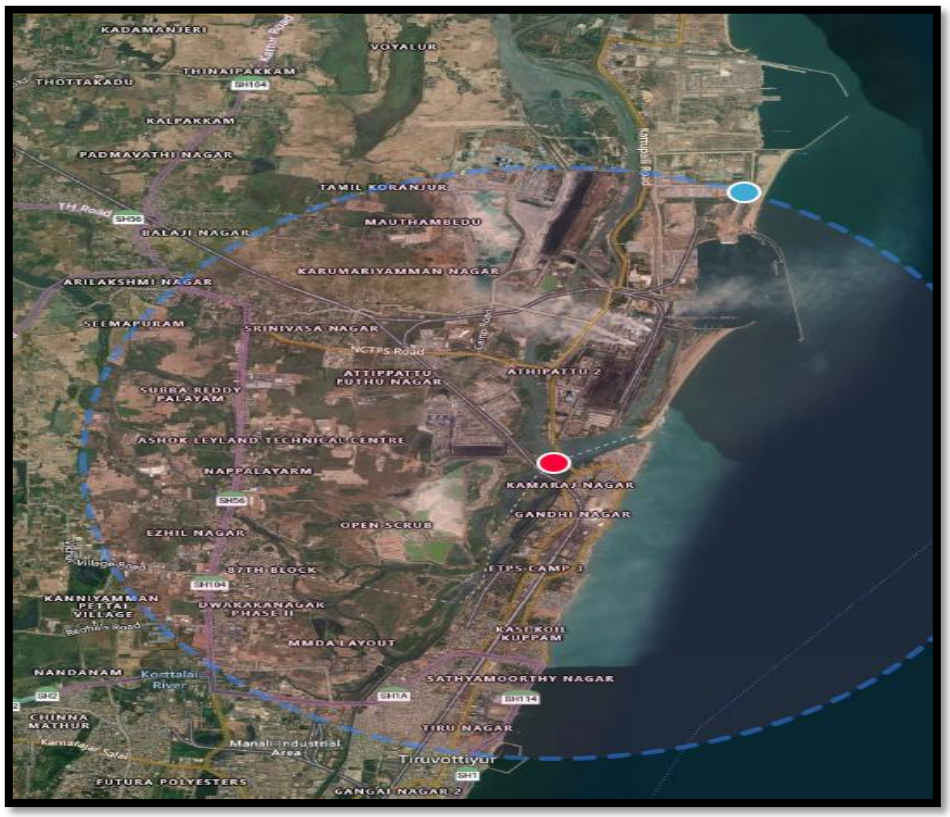


A map showing various water bodies around Manali – Ennore area

3.4. Ennore Creek

Ennore Creek, situated in the northern part of Chennai, is a vital water body that plays a significant role in the ecological and environmental landscape of the region. It is an estuarine creek that extends for approximately 25 kilometers, winding its way through the urban and industrialized areas of North Chennai.

The creek serves as a crucial transitional zone where freshwater from rivers and storm water runoff merges with the saline waters of the Bay of Bengal. Diverse ecosystems, including mangrove forests, mudflats, and tidal wetlands flank Ennore Creek. These ecosystems provide a habitat for a rich diversity of flora and fauna, serving as breeding grounds for several fish species and supporting numerous bird species, making it a hotspot for biodiversity. This unique ecosystem plays a crucial role in the region's ecological balance, supporting a diverse range of flora and fauna, acting as a natural flood control mechanism, and even contributing to the local economy.



Google map showing the location of Ennore creek

3.5 Ecological Significance of Ennore Creek:

Ennore Creek has extensive mangrove forests and is home to various plant species like Avicennia marina, Rhizophora mucronata, and Sonneratia apetala. These mangroves act as breeding grounds for fish and crustaceans, protect the coastline from erosion, and filter pollutants from the water. The rich ecosystem attracts a variety of bird species, including migratory birds like flamingos, pelicans, and sandpipers. Over 120 bird species have been documented in the Ennore Creek area, making it a haven for birdwatchers and nature enthusiasts.

The creek has diverse aquatic life, including fish, shrimps, crabs, and molluscs. These organisms play a vital role in the food chain and contribute to the ecosystem's overall health. Ennore Creek experiences strong tidal rhythms, influencing water flow and sediment transport. This dynamic environment creates unique habitats for various species and also plays a role in coastal protection.

3.6 Residential areas and fisherman activities

The Ennore region in Chennai is characterized by a unique juxtaposition of residential areas and vibrant fisherman activities along the Ennore Creek surroundings. This dynamic coexistence reflects the diverse lifestyles and economic activities that thrive in this coastal area.

Ennore is home to a mix of residential communities, ranging from traditional villages to more modern urban developments. The residents of these areas often have a strong connection to the water bodies that surround them, as many households depend on fishing or other maritime-related activities for their livelihoods. The residential landscape in Ennore is marked by a blend of traditional dwellings and newer housing developments, highlighting the area's socio-economic diversity.

Fishing is a predominant and time-honored occupation in the Ennore region, sustained by the rich marine resources provided by the Ennore Creek and the nearby Bay of Bengal. Fishermen in the area engage in various fishing techniques, including traditional methods such as net fishing and more modern approaches using

mechanized boats. The creek's estuarine ecosystem contributes significantly to the abundance of marine life, making it an ideal location for fishing activities.

Several fishing villages are in the Ennore Creek surroundings, each with its own distinct character and community ties. These villages are often close-knit, with residents sharing a deep-rooted connection to the sea and its resources. Fishing villages contribute to the cultural fabric of the region, maintaining age-old traditions while adapting to the changing dynamics of the fishing industry.

3.7 Mangrove forests

Ennore is renowned for its extensive mangrove forests that play a pivotal role in the region's ecological health. These lush green ecosystems, characterized by salt-tolerant trees and shrubs, are situated along the banks of Ennore Creek and contribute significantly to the area's environmental sustainability. Ennore's mangrove forests are biodiversity hotspots and serve as critical habitats for a diverse range of flora and fauna. These ecosystems are breeding grounds for various fish species, mollusks, and crustaceans, providing a nursery for juvenile marine life. The intertwining roots of mangroves also offer shelter to numerous species of birds, insects, and amphibians.

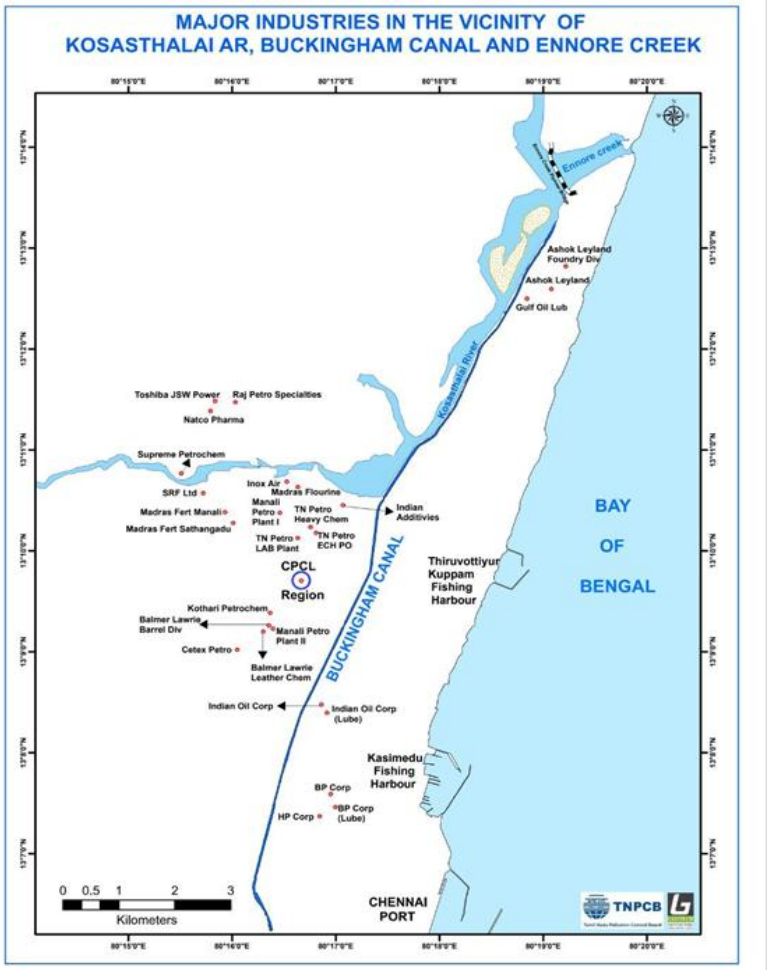
Mangroves help in water quality improvement by acting as natural filters, trapping sediments and pollutants from runoff before they reach the water bodies. This natural filtration process helps maintain water quality in Ennore Creek, ensuring a healthier environment for aquatic life and the local community. The dense network of mangrove roots acts as a natural buffer against coastal erosion and storm surges. This protective barrier helps stabilize the shoreline, reducing the impact of tidal movements and safeguarding adjacent areas from the adverse effects of extreme weather events. The mangroves of Ennore contribute significantly to the local fisheries industry and country’s economy. They support the livelihoods of numerous fishermen who depend on the abundant marine life that these coastal forests nurture by providing a favorable environment for fish breeding and spawning.

A view of mangrove forest in Ennore creek

Mangroves are highly efficient carbon sequestration agents, capturing and storing large amounts of carbon dioxide from the atmosphere. This not only helps mitigate the impacts of climate change but also contributes to the overall reduction of greenhouse gas emissions. The ability of mangroves to trap sediment and build up land elevation over time makes them crucial in adapting to rising sea levels. These forests act as natural barriers, helping coastal areas withstand the challenges posed by climate change.

4. Details of Preliminary Inspection carried in the industries in Manali and Ennore by TNPCB

The TNPCB has formed 7 teams consisting of DEEs, AEEs and AEs to inspect all the industries in Manali area to check whether any oil spillage has happened during the flood. The inspection team of TNPCB visited 29 industries in Manali and Ennore area on 11/12/2023 and the summary of the observation made during the inspection is listed in the Table. The location of the major industries and the water bodies in Manali area is shown in the following figure.



A map showing the location major industries and water bodies in Manali

Sl. No	Name of the Industry	Observation ofoil spillage in the premises
1	M/s. Indian Additives Ltd Manali Village	Reported that during a flood on 04.12.2023, flood water mixed with thick black oil entered into the unit premises through the main gate entrance and spread over the area.
2	M/s. Kothari Petrochemicals Ltd (Co-Generation Power Plant) Sathangadu Village	No traces of oil were found within the premises
3	M/s. Kothari Petrochemicals Ltd Sathangadu Village	No traces of oil were found within the premises
4	M/s. Cetex Petrochemical Ltd Sathangadu Village	No traces of oil were found within the premises
5	M/s. Madras Fertilizers Ltd Sathangadu Village	No traces of oil were found in the storm water drain leading to Buckingham Canal
6	M/s. Madras Fertilizers Ltd Manali Village	No traces of oil were found in the storm water drain leading to Buckingham Canal
7	M/s. Supreme Petrochem Ltd Manali Village	No traces of oil were found in the storm water drain leading to Buckingham Canal
8	M/s. SRF Ltd Technical Textile Business Manali Village	No traces of oil were found in the storm water drain leading to Buckingham Canal
9	M/s. Gulf Oil Lubricants India Ltd Kathivakkam Village	No traces of oil were found in the storm water drain
10	M/s. Ashok Leyland Ltd Ennore Village	No traces of oil were found in the storm water drain
11	M/s. Ashok Leyland Ltd – Foundry Division Kathivakkam Village	No traces of oil were found in the storm water drain
12	M/s. Manali Petrochemical Ltd – Plant I Manali Village	No traces of oil or oily matter were found in the storm water drain and adjoining areas.
13	M/s. Manali Petrochemical Ltd – Plant II Manali Village	No oily matter was found in the drain and its side walls
14	M/s. Tamilnadu Petrochemicals Ltd – Heavy Chemicals Division Manali Village	No oily matter was found in the drain and its side walls
15	M/s. Tamilnadu Petrochemicals Ltd – ECH – PO Plant Manali Village	No oily matter was found in the drain and its side walls
16	M/s. Tamilnadu Petrochemicals Ltd – LAB Plant Manali Village	No oily matter was found in the drain and its side walls

17	M/s. Raj Petro Specialties Pvt Ltd Manali Village	No oil-bearing wastewater was flowing in the storm water drain.
18	M/s. Natco Pharma Ltd Manali Village	No oil bearing waste water was flowing in the storm water drain.
19	M/s. Toshiba JSW Power System Pvt Ltd Manali Village	Water containing lube oil in the machines was found contained in the premises itself and no oil bearing wastewater was flowing in the channel.
20	M/s. Bharat Petroleum Corporation Ltd (Lube Oil Blending Plant) Tondiarpet Village	Stagnated flood was water found to be drained out completely
21	M/s. Bharat Petroleum Corporation Ltd (Tondiarpet Installation) Tondiarpet Village	Stagnated flood water was found to be drained out completely
22	M/s. Hindustan Petroleum Corporation Ltd (Chennai Terminal – Lubes) Tondiarpet Village	Stagnated flood water was found to be drained out completely
23	M/s. Indian Oil Corporation Ltd (Lube Oil Blending Plant) Tondiarpet Village	A stagnated flood water was found to be drained out completely
24	M/s. Indian Oil Corporation Ltd (Tondiarpet Terminal) Tondiarpet Village	The storm water near the administrative Building was removed but the tank farm area was flooded with 1 feet depth of water
25	M/s. BalmerLawrie& Co Ltd, Barrel Division Sathangadu Village	The unit has not contributed to the cause of the recent oil spillage in the Ennore creek area.
26	M/s. BalmerLawrie& Co Ltd, Grease and Lubricant Division Sathangadu Village	The unit has not contributed the cause of the recent oil spillage in the Ennore creek area.
27	M/s. BalmerLawrie& Co Ltd, Leather Chemicals Division Sathangadu Village	The unit has not contributed the cause of the recent oil spillage in the Ennore creek area.
28	M/s.Inox Air Products Pvt Ltd Manali Express Highway	The unit has not contributed the cause of the recent oil spillage in the Ennore creek area.
29	M/s. Madras FlourinePvt Ltd Manali Express Highway	The unit has not contributed to the cause of the recent oil spillage in the Ennore creek area.

From the inspection reports, it is inferred that no oil foot prints were observed in the premises of 28 industries and the oil footprints were observed only in one industry namely M/s. Indian Additives Ltd.,(IAL) in addition to M/s. CPCL. It was informed by

M/s. Indian Additives Ltd., that flood water mixed with thick black oil entered into the unit premises through the main gate entrance and spread over the area.

5. Inspection of the Technical Team and observations

The Technical Team inspected the entire premises of M/s CPCL in general and in particular, the storm water drainage system& its storage ponds, the Petcoke processing area, the ETP area, sludge storage tanks, sludge bioremediation process area and crude storage area during the inspection, the following observations were made.

Inspection of CPCL by the Technical Team on 11/12/12023

1. The storm water collection pond A was inspected and it was observed that there is a provision to pump the storm water to collection Pond C and there is an outlet leading to Buckingham Canal. Under normal circumstances, the Pond A storage water is pumped into ETP, however, it is pumped outside the premises into Buckingham Canal during heavy rains. Though there is an oil water separator

provided, as the level of storm water raises above the pond level, there seems to be an overflow that can reach the Buckingham Canal along with a huge quantity of floating oil.

2. The traces of oil on the shrubs, roads and side walls located in and around the Pond A area indicates the possible overflow of oil from the storm water ponds. There is a surge pond located adjacent to Pond “A” where a lot of oil spillages were noticed and a cleaning operation was under progress. Though this pond is reported to be not in use, the stagnated water in this pond with high oil content could have overflowed into Buckingham Canal from M/s CPCL premises.

Oil spillage observed around Storm water collection Pond A

Surge pond and drain opposite to surge pond

3. During the inspection of the Pond “C”, it was noticed that there is a provision to pump out the water for further treatment in the ETP for reuse. However, there is also a provision, where the water stored in the pond shall directly reach the Buckingham Canal. There are also possibilities that oil may be directly flowing out when the level of water is raised more than the brim level of the pond.

Oil spillage observed near Pond C and its surroundings

4. In Pond “D” also, there is a provision to pump out the storm water for further treatment in ETP for reuse. Here also there are possibilities of oil mixed water may be directly flowing out from the premises when the level of water is raised more than the level of the pond.

5. In the ETP and MTF(Mandatory Tank Farm) areas, where Pond“E” is located which has also got pumping facility to discharge into the Buckingham Canal. A

thick layer of oil found in the drainage area and pipelines reveals that a huge quantity of oil could have found its way to the Buckingham Canal.

Drain leading to B' Canal which was cleaned before the inspection by CPCL

6. There is a sludge storage tank where the tank bottom sludge is brought and stored. From this sludge, oil is removed through a centrifugal system for further reuse and the remaining sludge is sent for bioremediation. During the inspection, it was found that there occurred an overflow which could have carried oil along with thick oil sludge to the Buckingham Canal. Though this tank is situated at higher elevation, there is no proper protection to contain the overflow during rainy days; overflow from this tank joins the storm water drain which leads eventually to Buckingham Canal.

Oil Sludge storage tanks and their surrouning area

7. The bioremediation of oil sludge operation is also carried out in an open area without any roof which might have also added further discharge of oil content into the Buckingham Canal.

8. During the inspection of Buckingham Canal, there were no traces of oil found in the upstream side of M/s CPCL, whereas oil deposits are found continuously in the banks of Buckingham Canal in the downstream of M/s. CPCL storm water outlet points. There was a flow in the Buckingham Canal which was also carried oil traces in the downstream of M/s CPCL discharge points.

Oil Spillage observed on side walls of Buckingham canal

Oil spillage deposited in EnnoreCreek

The cleanup operation carried out by M/s CPCL in Ennore Creek was also inspected by the team and found that the magnitude of the cleaning is very low when compared to the level of cleaning operations to be undertaken for the removal of oil in the Buckingham Canal and Ennore creek.

Seven teams comprising of Engineers from TNPCB inspected the remaining industries in the Manali area on 11.12.2023 to ascertain the discharge of oily substances during the heavy rains. From the inspection reports, it is inferred that no oil foot prints were observed in the premises of 28 industries and the oil footprints were observed only in one industry namely M/s. Indian Additives Ltd.,(IAL) in addition to M/s. CPCL. It was informed by M/s. Indian Additives Ltd., that flood water mixed with thick black oil entered into the unit premises through the main gate entrance and spread over the area.

5.1 Meeting of the Team and Visit to Ennore Creek area to visualize the ongoing clean-up operation:

A meeting has been organized by TNPCB through VC comprising Technical Team members dated 13th Dec. 2023 to discuss various aspects of the oil spread issues. It was decided that the team members would visit the Ennore Creek area to monitor the status of Buckingham Canal and its restoration. Subsequently, a meeting

was convened at TNPCB office dated 14th Dec. 2023 to discuss the details of monitoring and analysis reports.

Photo showing foot print of oil spillage from R&D Gate of CPCL to drain

Photo showing oil spillage residues on compound wall near to the drain

It is also observed that the oil spillage residues on side walls of drain passing in front of Research Centre Gate of CPCL. M/s IAL is located next to this gate. Efforts are being made to collect the oil from Buckingham Canal, Kosasthalaiyar River and Ennore Creek through oil booms, gully suckers, oil skimmers, .TNPCB reported that 2,20,040litresof oil-water mixture has been collected (as of 31.12.2023). The actual quantity of oil present in the above said oil water mixture is to be assessed after analyzing the representative samples from collected mixture.

Efforts are being made to remove the oil-deposited soil/wastes from the bank of Buckingham Canal and Kosasthalaiyar River. It was informed that 663.5 tonnes of oil laden soil & debris have been removed from Buckingham Canal and Kosasthalaiyar River and stored them at the premises of CPCL. The actually quantity of oil present in the above said soil/wastes is to be assessed after analyzing the representative samples from collected mixture.

5.2 Field visit of Team to find other sources for Oil spillage in Buckingham Canal and Ennore Creek:

The Team members and TNPCB officials verified the suspected three pipelines crossing across the drain which is joining Kosasthalaiyar River and confirmed through respective owners of the pipelines that one pipeline is carrying treated effluent for marine disposal and two pipes belongs to Chennai Metro Water Supply in that one is defunct. The team revisited the suspected oil spillage sources inside the CPCL, huge oil spillage foot print was observed around the pond D, oil bearing water might be breached from this pond through outlet of the south side compound. The reconstruction of the portion of the Southside compound wall confirms the breaching of oilbearing water to adjacent storm water drain exist in CMD Steel yard. The foot print of oil spillage along this drain in spite of cleaning confirms the breaching of huge quantity of oil bearing water from the CPCL process area. The stagnated oil in the storm water drain contributing thin oil spillage to Buckingham canal and Kosasthalairiver.

Photos showing 3 pipe line crossing drain Patch work done in breached compound wall

Photos showing oil / oil laden water from CPCL found its way into the storm water drain passing through the CMDA steel yard

The Team also observed oil spillage foot prints in many places of process area and as well as near to old defunct ETP inside the premises. The two pipelines having cuts and with oil smears were observed near the process area which is also indicating the breaching of pipeline carrying slop oil or crude. The unit was not allowed to take photographs as per their protocol, team asked the unit to produce the photos of spots visited but no photos are received .

Stagnated oil bearing water was observed around the crude oil tank (Tank no 117), huge oil spillage foot print observed along with the drain adjacent to this tank. This also one of the strong suspicious source of oil breach.

Photo showing oil spillage along drain passing adjacent to sludge storage and crude oil storage tank

6. Findings of the Team based on the information provided by the M/s CPCL:

As per the suggestions of the Team TNPCB requested M/s CPCL to provide certain details viz; quantity of slop oil, O&M details, the mass balance of raw materials, sludge storage, etc. M/s CPCL has submitted the following details vide letter dated 14.12.2023, the details are as below;

<table>
<tr><th>SI NO</th><th>Information requested</th><th>Information provided by CPCL</th></tr>
<tr><td>i</td><td>Oily waste material collected from day to day operations, from all the storm water ponds, ETPs and other sources and its quantity, its storage method and disposals details</td><td>Slop Oil quantity collected from storm water ponds, ETPs and other sources for the last three months is furnished below
<table>
<tr><td>Month</td><td>Quantity, KL</td></tr>
<tr><td>September</td><td>1939</td></tr>
<tr><td>October</td><td>4528</td></tr>
<tr><td>November</td><td>1238</td></tr>
</table>
Slop oil is stored in Slop Tanks and reprocessed with Crude.</td></tr>
<tr><td>ii</td><td>Whether cleaning operation carried out before Michaung flood, its collection details.</td><td>Details of major activities carried out as part of pre monsoon preparedness is furnished below:
Storm water canal cleaning
Building roof cleaning
Dewatering pumps checking & availability</td></tr>
<tr><td>iii</td><td>Whether all the refineries are in operation during the flood, if not details shall be furnished. Further receipt of crude oil from 1st December 2023 to 9th December 2023 shall be furnished</td><td>Out of 3 Refineries, only one Refinery was in operation during flood. Other two Refineries were under circulation.
Details of Crude Oil Receipt from 01.12.23 to 09.12.23 is furnished below:
<table>
<tr><td>Date</td><td>Crude receipt in TMT</td></tr>
<tr><td>01.12.23</td><td rowspan="4">No receipt</td></tr>
<tr><td>02.12.23</td></tr>
<tr><td>03.12.23</td></tr>
<tr><td>04.12.23</td></tr>
<tr><td>05.12.23 20.48 hrs to 07.12.23 06.00 hrs</td><td>135</td></tr>
<tr><td>09.12.23 18.54 hrs to 11.12.23 hrs 07.12 hrs</td><td>99</td></tr>
</table></td></tr>
<tr><td>iv</td><td>Total quantity of Sludge stored inside the premises and its</td><td>Quantity of Sludge Stored in CPCL is 2300 KL in sludge pond. The sludge would be mechanically treated to extract oil and residual material would be</td></tr>
</table>

<table>
<tr><td></td><td>method of disposal</td><td>bioremediated. Extract oil would be reprocessed thro’ crude tanks</td></tr>
<tr><td>v</td><td>Frequency of conducting spillage deduction along with details of records maintained.</td><td>Spillage Detection & Repair study is carried out yearly once in CPCL and the report is submitted to TNPCB regularly. The latest report is submitted in Jan 23 (Annexure-A)</td></tr>
<tr><td>vi</td><td>Mass balance of raw material and product manufactured</td><td>Mass balance in Tons/ day furnished below
<table><tr><td>Crude through put</td><td>28.8</td></tr><tr><td>LPG</td><td>1.0</td></tr><tr><td>Naphtha</td><td>2.4</td></tr><tr><td>Petrol (M.S)</td><td>3.0</td></tr><tr><td>ATF</td><td>3.2</td></tr><tr><td>Diesel</td><td>15.0</td></tr><tr><td>Lobs/Wax</td><td>0.8</td></tr><tr><td>Bitumen</td><td>1.2</td></tr><tr><td>Internal fuel</td><td>2.2</td></tr></table></td></tr>
<tr><td>vii</td><td>Number of unused storage tanks and number of it for maintenance

The details of date of clean in progress taken for crude oil tanks, slops storage and other.</td><td>Details of idle and M&I tanks is furnished as
Tanks released and under Maintenance
<table><tr><th>Sl. No.</th><th>Tank No.</th><th>Service</th><th>Remarks</th></tr><tr><td>1</td><td>343</td><td>DWO(HH)</td><td>Released in Oct 23</td></tr><tr><td>2</td><td>412</td><td>SK(LAB)</td><td>Released in Sep 23</td></tr><tr><td>3</td><td>418</td><td>ATF</td><td>Released in Oct 23</td></tr><tr><td>4</td><td>107</td><td>Crude</td><td>Released in Oct 23</td></tr><tr><td>5</td><td>820</td><td>Dry slop</td><td>Released in Sep 23</td></tr><tr><td>6</td><td>310</td><td>HN/DAO</td><td>Released in Mar’23</td></tr><tr><td>7</td><td>311</td><td>IN/HN/DAO</td><td>Released in Mar’23</td></tr><tr><td>8</td><td>309</td><td>Raff</td><td>Released in Jun’23</td></tr></table></td></tr>
</table>

<table>
<tr><td></td><td></td><td>
<table>
<tr><td>9</td><td>201</td><td>RFO</td><td>Released in Jun’23</td></tr>
<tr><td>10</td><td>204-D-1</td><td>VBU Feed</td><td>Released in Jun’23.</td></tr>
<tr><td>11</td><td>312</td><td>IN/HN/DAO</td><td>Released in Sep’23</td></tr>
<tr><td>12</td><td>919</td><td>Wax</td><td>Released in Oct’23</td></tr>
<tr><td>13</td><td>345</td><td>DWO/RAFF</td><td>Released in Sep’23</td></tr>
</table>
Details of tanks unused tanks:
<table>
<tr><th>Sl. No.</th><th>Tank No.</th><th>Service</th></tr>
<tr><td>1</td><td>806</td><td>Slop Oil</td></tr>
<tr><td>2</td><td>383</td><td>Wax</td></tr>
<tr><td>3</td><td>384</td><td>Wax</td></tr>
</table>
</td></tr>
<tr><td>viii</td><td>Details of the sludge stored in the open yard</td><td>All sludge is stored in concrete pit with impervious layer and is at higher elevation.</td></tr>
<tr><td>ix</td><td>Any operations carried out to protect the refinery to avoid untoward incidents during the flood time</td><td>➢ One Refinery out of 3 Refineries was operated to maintain product supply to market.
➢ Tractors trailers & fire truck were operated to bring Manpower & Material inside Refinery</td></tr>
<tr><td>x</td><td>The details of Characteristics of waste oil collected from ETPs & storm water collection ponds</td><td>Slop oil is a mixture of oil collected from various sources. Slop Oil is reprocessed with crude. Since the qty of slop oil is very minimal, analysis is not required. However as per instruction, one sample was analysed today (14.12.23) and the result is furnished below.
a) Density-0.873 gm/cc
b) Sulphur- 2.09 %
c) Flash- 37 Deg C
d) Viscosity @ 40 Deg C- 6.6</td></tr>
<tr><td>xi</td><td>The details of products sent to Manali customers and control mechanism provided to safe guard during no demand period</td><td>
<table>
<tr><th>Industry</th><th>Products</th><th>In case of No demand</th></tr>
<tr><td>TPL</td><td>LABFS</td><td>Will be absorbed in Diesel pool / converted to ATF</td></tr>
<tr><td>MPL</td><td>Propylene</td><td>Will be sold as LPG</td></tr>
</table>
</td></tr>
</table>

			KPL	*PBFS*		
				LPBFS		
			Cetex Petrochemicals	*Butene2*		
				MEKFS		

From the above information, the Team noticed the following;

- As per the information given at Sl. (i), it is inferred that the average slop oil collected from ETPs and other sources ranges from 50 kld to 150 kld. Due to heavy rain since December 03 and 04, 2023, the collection of slop oil might not be happened, this slop oil might be washed away due to rising of water levels in all ponds since the ponds were just above the ground level. As per this information, the quantity washed away might be more than 400 kl.
- As per the information given at Sl.(iv), it is inferred that 2300 kl oil-bearing sludge is being stored in the sludge pond. The same was observed during the team visit and noticed that the sludge stored was up to the brim level, the oil mixed sludge might be washed away to drain due to the flood which is directly leading to the Buckingham Canal.
- As per the information given at Sl(vii), it is inferred that eight crude oil storage tanks were taken for maintenance during September – October 2023. The oil-bearing sludge required to be separated through centrifugation and the same has to be taken for bio remediation. At least 90 days are required to complete one cycle of bio remediation. Eight tanks were taken for maintenance in the last three months, the oil bearing sludge might be stored in the ponds, due to the flood, these sludge might be washed away. One of the nearby industry namely M/s Indian Additives Ltd, reported to the TNPCB team on 04.12.2023 that the mixture of thick Black oil & water was gushed into their premises. The statement of industry also confirms that the probability of washing of oil-bearing sludge from their storage dykes.
- Inspite of sever cyclonic and heavy rain fall alert by IMD and Govt. of Tamil Nadu, the unit is not taken any precautionary measures to contain the oil spillage from

their ponds and ETPs. And also unit is not having either flood management plan or emergency contingency plan to contain oil spillage.

7. Monitoring of Water and Air Quality

7.1 Variation of Oil & Grease level in water bodies

The presence of 828 mg/L of Oil & Grease and 48.4 mg/L Total Phenolic Compounds in the sample collected at Ennore Creek Bridge on 05/12/2023 as against the standards of 10 mg/L and 1.0 mg/L clearly indicates the high oil content in the water bodies. (Annexure 2).

On 07.12.2023, five samples were collected along the Buckingham Canal stretch and near CPCL campus and the Oil & Grease value was varying from 28 mg/L at the B' Canal, near IOCL gate, Tondiarpet to 158 mg/L at Ennore creek. This report clearly indicates that Oil & Grease value in the B' Canal in the upstream of CPCL was lower compared to its level in Ennore creek which is in the downstream of CPCL. The Oil & Grease value was 230 mg/L in the sample collected in the stagnant water in the storm water drain near south gate of CPCL. The high Oil & Grease value inB' Canal in the downstream of CPCL and in the stagnant water in the storm water drain near south gate of CPCL clearly indicate oil spillage from CPCL.

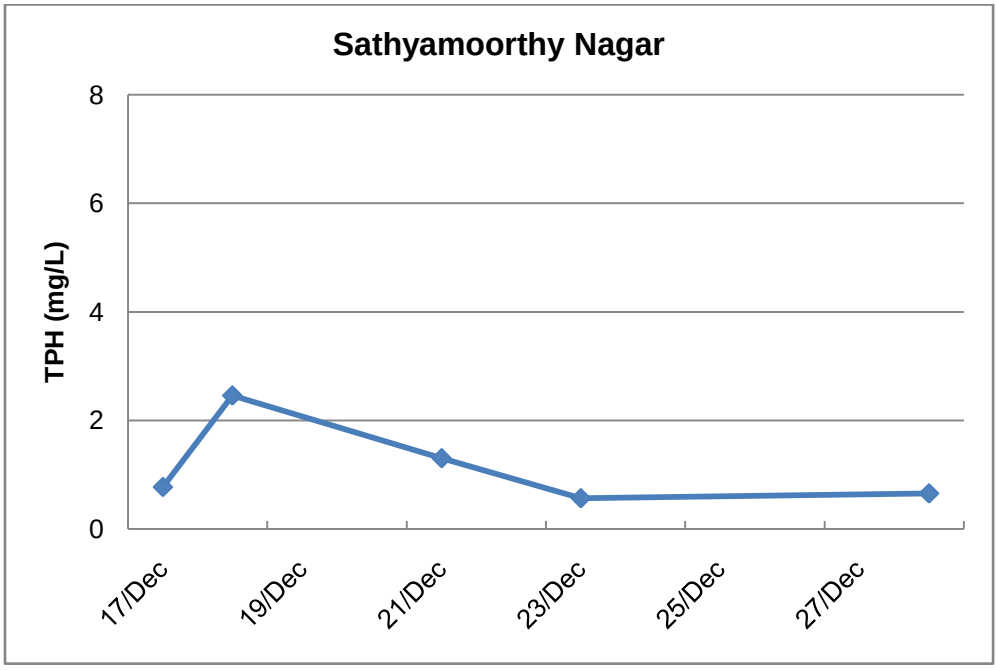
The Oil & Grease value in the samples collected on 09/12/2023 from storm water ponds inside the CPCL premises ranges from 46 mg/L to 96 mg/L indicates clearly that Oil & Grease got mixed with storm water in the unit of CPCL.

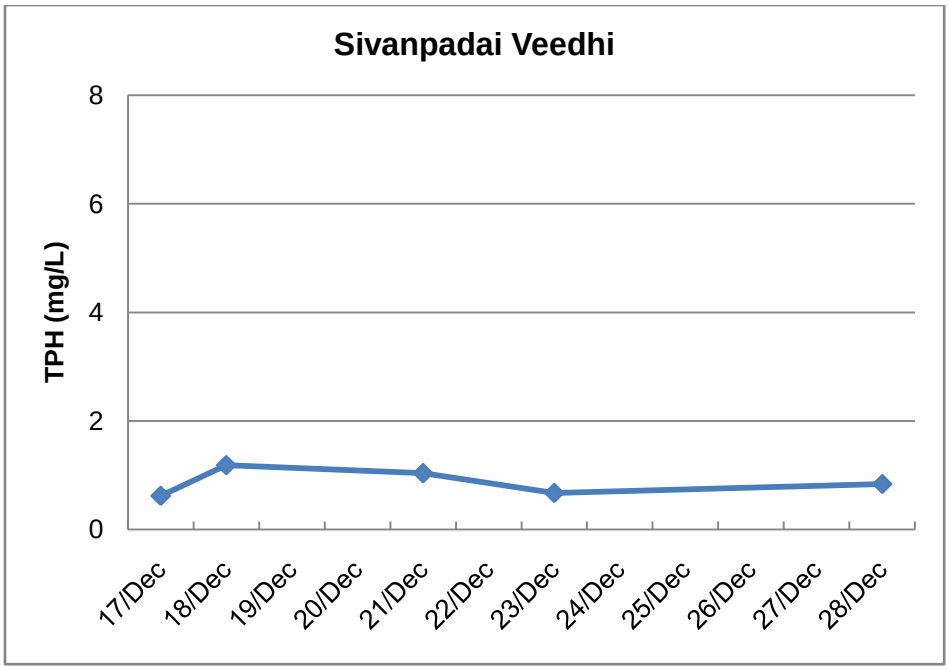
7.2 Variation of Total Petroleum Hydrocarbons (TPH) level in water bodies

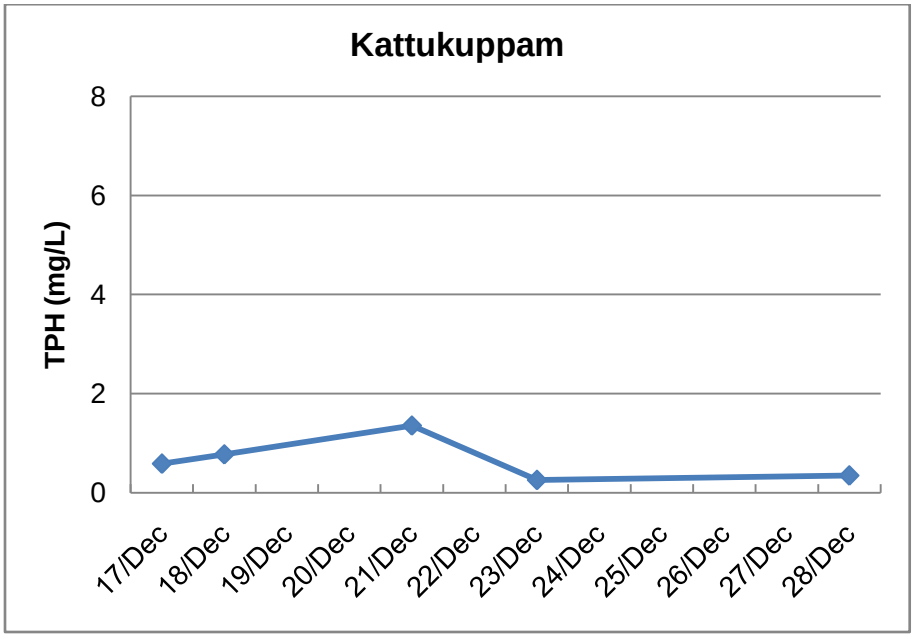
Surface water samples were collected by TNPCB officials and analysed at a NABL accredited private laboratory post the oil spillage and cleaning activities carried out across Ennore and Neighbouring coastal areas (17-12-2023 to 28-12-2023).Samples were analysed for Total Petroleum Hydrocarbons (TPH) and the results are tabulated below. The decreasing trend of TPH value from 17/12/2023 to 23/12/2023 in most of the locations and the flat graph of the same from 23/12/2023 probably indicates that no fresh contamination of B' Canal is occurring from CPCL which is the

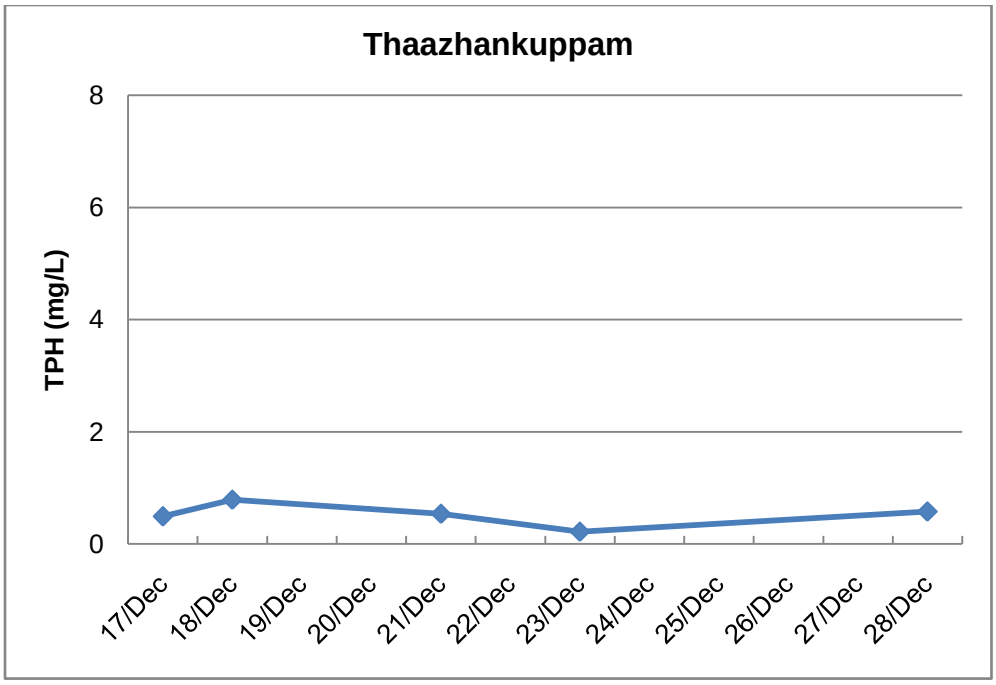
major contributor of TPH. The cleaning and remediation activities is responsible for reduction of TPH initially.

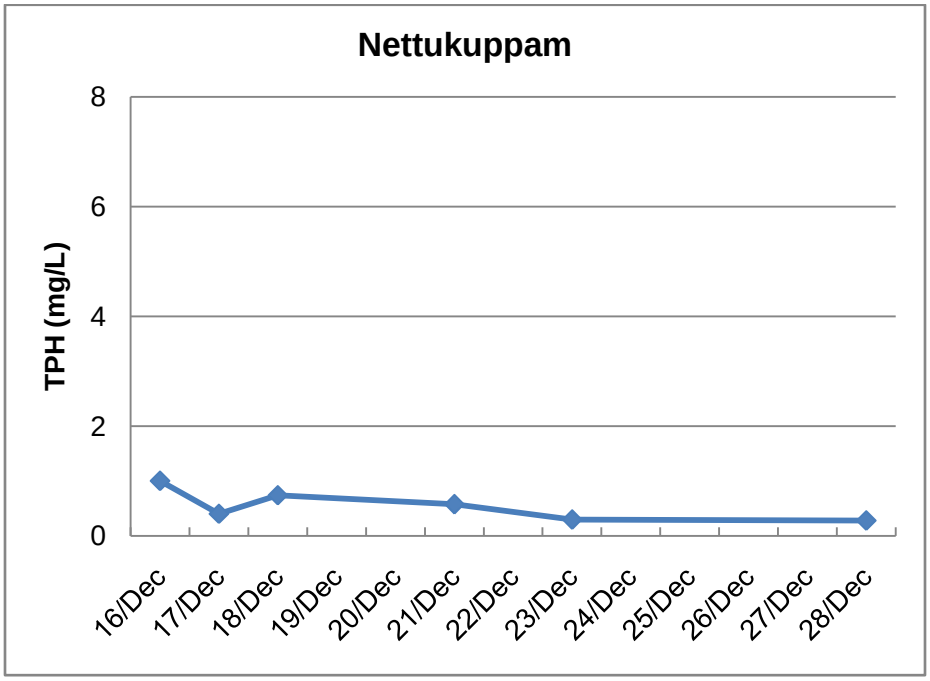
Sampling Location	17.12.2023	18.12.2023	21.12.2023	23.12.2023	28.12.2023
Sathyamoorthy Nagar	0.772	2.458	1.302	0.565	0.653
SivanpadaiVeedhi	0.619	1.185	1.034	0.672	0.837
Kattukuppam	0.584	0.775	1.355	0.253	0.344
Thaazhankuppam	0.488	0.787	0.536	0.217	0.576
Nettukuppam	0.402	0.74	0.573	0.294	0.277




Sivanpadai Veedhi
TPH (mg/L)
8
6
4
2
0
17/Dec
18/Dec
19/Dec
20/Dec
21/Dec
22/Dec
23/Dec
24/Dec
25/Dec
26/Dec
27/Dec
28/Dec


Kattukuppam
TPH (mg/L)
8
6
4
2
0
17/Dec
18/Dec
19/Dec
20/Dec
21/Dec
22/Dec
23/Dec
24/Dec
25/Dec
26/Dec
27/Dec
28/Dec

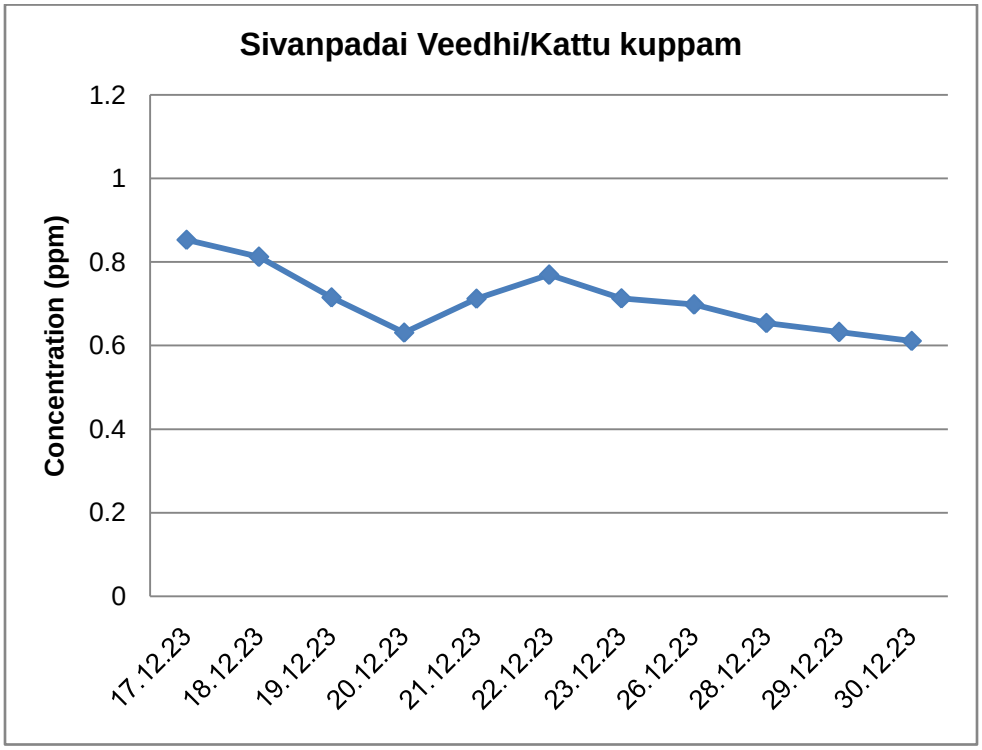


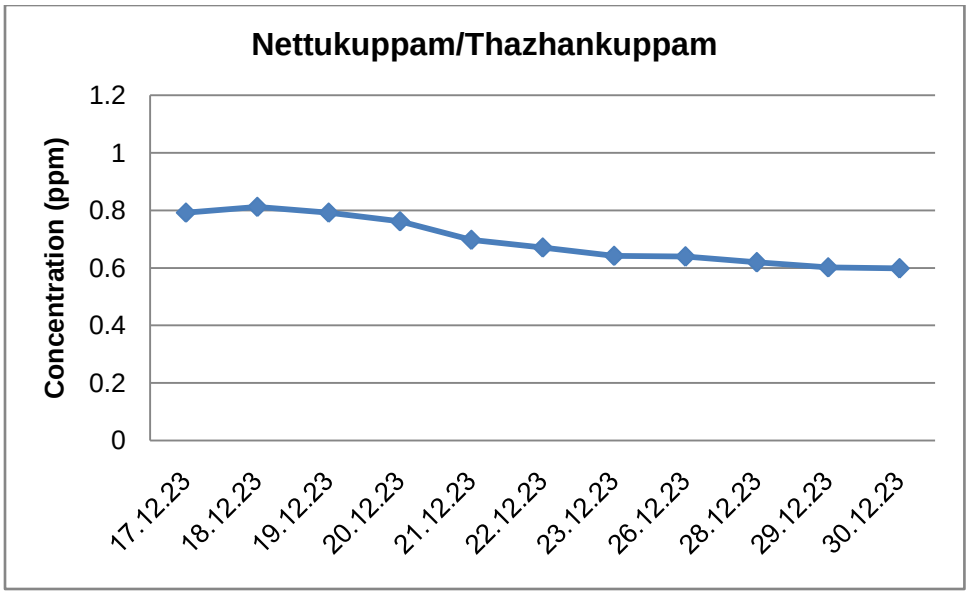


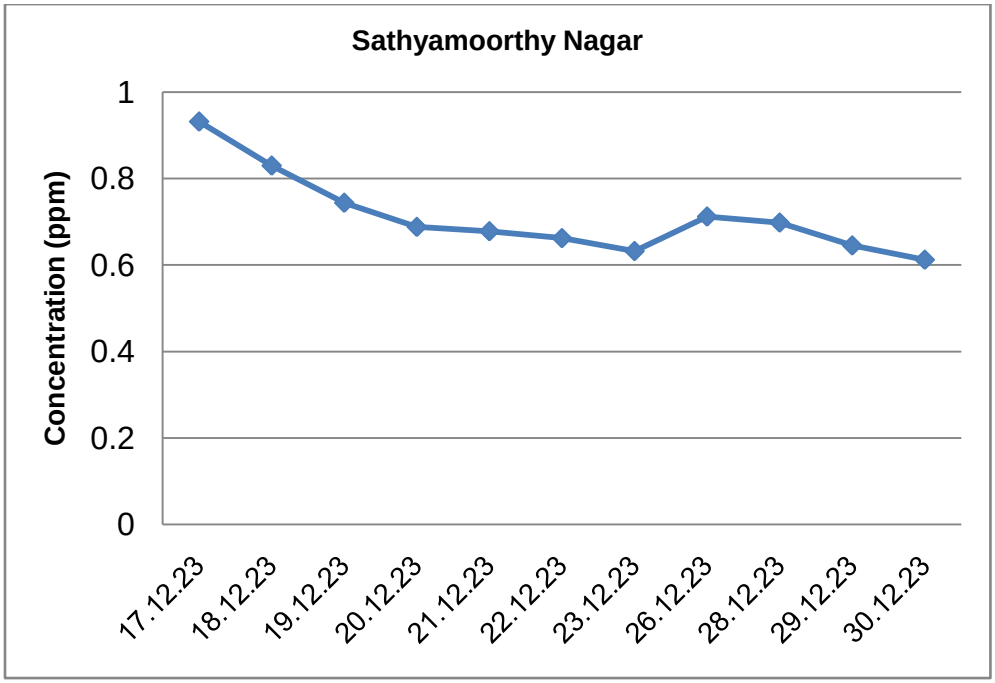
Graphs showing the variation of TPH value at various sampling locations

7.3 Variation of Total VOC (TVOC) level in the ambient air

TVOC analysis in the ambient air was conducted in five locations covering upstream near IOCL Tondiyarpet Terminal and Near CPCL South Gate and downstream at SivanpadaiVeedhi/Kattukuppam at Nettukuppam/Thazhankuppam and at Sathyamoorthy Nagar of oil-spillage affected areas from 17th December 2023 to 30th December 2023.





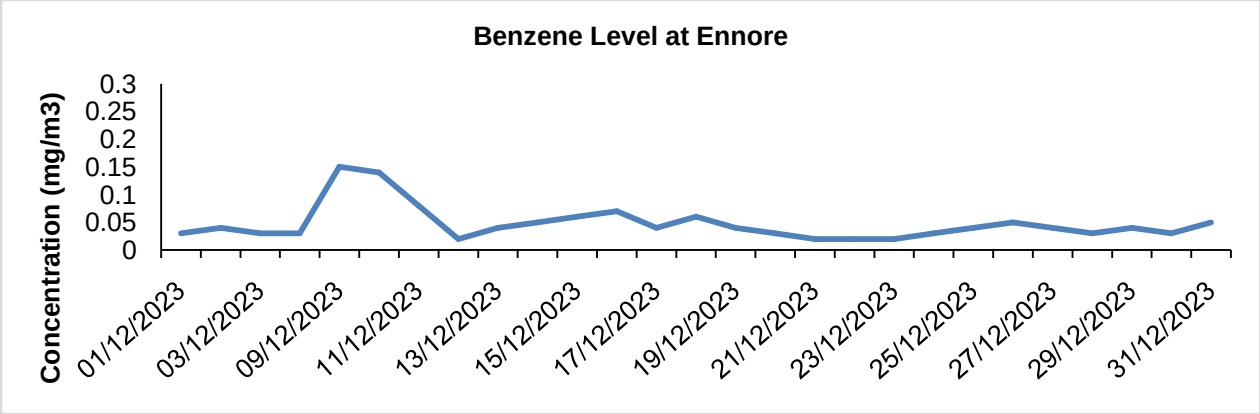


Graphs showing the variation of TVOC value at various sampling locations

The graph of TVOC results revealed gradual decreasing trend in all the locations due to continuous cleaning work carried out by CPCL under the supervision and guidance of Government of Tamil Nadu.

7.4 Variation of Benzenelevel in the ambient air

The variation of benzene level in the ambient air monitored in Continuous Ambient Air Quality Monitoring (CAAQM) Station, Kathivakkam from 01/12/2023 to 31/12/2023 is shown in the following graph. It is inferred from the graph that the concentration of benzene increased slightly from 09.12.2023 to 12.12.2023 in the month of December due to oil spillage in the surrounding area. However, the concentration of the Benzene for the month of December 2023.is found to be well within the National Ambient Air Quality Standard (5 microgram/m3 annual average).The concentration of benzene decreased progressively upon the commencement of cleaning activity. Further, from 05.12.2023 to 08.12.2023 the station was not in operation, due to power shutdown during Michaung cyclone.



Variation of benzene level in the ambient air monitored in CAAQM, Kathivakkam

8. Findings of the Team :

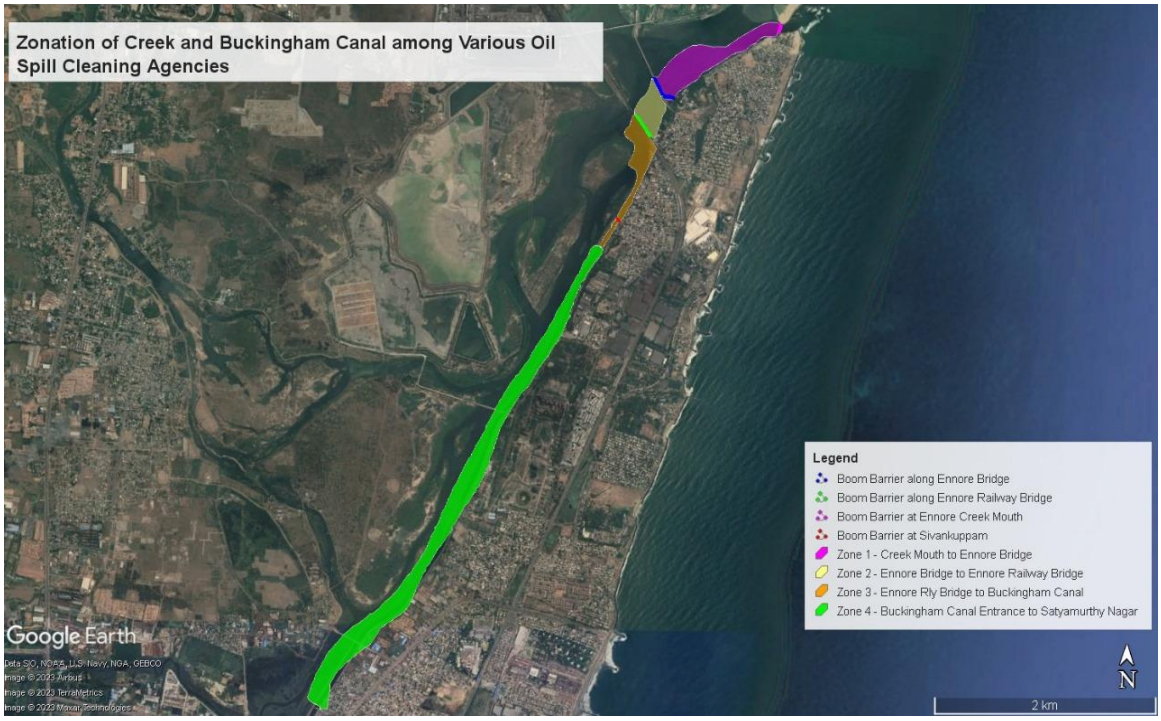
1. Based on the field observations, the team has come to the conclusion that the unit is a huge oil handling facility with the inadequate storm water management system and storm water storage ponds. it is therefore evident that huge quantity of oil bearing water has been breached from M/s Chennai Petroleum Corporation Ltd., into the Buckingham Canal and in turn to Ennore Creek during flooding caused by cyclone Michaung.
2. The information provided by the industry regarding the slop oil collection, tank bottom sludge collection, etc proves that cumulative oil slops from the ETP, Storm water collection ponds and bottom sludge generated during the maintenance of eight crude tanks, are major sources of oil spillage into Buckingham Canal and Ennore Creek.
3. During the second visit of the team, breaching of compound wall adjacent to the drain, possible breaching of oil from the pipeline carrying slop oil/crude and breaching of tank bottom sludge from Crude oil tank no.117 were observed and the same confirms that oil spillage occurred inside the plant and spillageed into the adjacent water bodies.

As far as the estimation of amount of oil reached the water bodies and the environmental damage, IITM has been requested by the Government of Tamil Nadu to carry out a detailed scientific assessment of environmental damage caused by this incident including the finger printing of the oil and the quantification of oil that would have reached the water bodies. Based on the IITM assessment environmental compensation shall be worked out by TNPCB in consultation with CPCB and necessary action shall be taken to levy the same and collect it from CPCL.

9. Remediation measures

The remediation works are focused on oil containment and oil removal. To serve as a focal point for all these oil clearing activities, an Oil spillage Management Co-ordination Centre was set up at Nettukuppam to monitor the oil clearing activities. Works for removal of oil from Buckingham Canal commenced on 12.12.2023 at NettuKuppam and Ennore Villages. The oil affected areas were divided into four stretches as below and specialized agencies were deployed for each stretch.

Zone	Name of the Stretch	Agency	Distance (Km)
I	Nettukuppam to Ennore Bridge	M/s. Viraj Clean Sea Enterprises	1.5
II	Ennore Bridge to Railway Bridge (Kattukuppaam)	M/s. Vens Hydra Lift Pvt Ltd	0.35
III	Railway Bridge to entrance of Buckingham canal	M/s. Sea Care Services	1.0
IV	Buckingham canal to Sathyamurthy Nagar	M/s. Neowin India Ltd	6



Google map showing four cleaning zones

Highly trained manpower from all these specialized agencies were mobilized on all four stretches for removal of oil mixed with water and oil laden debris. As on 01.12.2024, a total of 11,125 man-days has been utilized. On daily basis, the clearing activities were carried out with help of the following machinery and equipment

Cleaning operations at Ennore mangrove forest area by trained manpower

The detail of machineries used during remediation and cleaning operations are indicated in the following table

Machinery/Equipment deployed	
For Containment	Quantum
Oil Boom	1380 m
Absorbent Booms	100 m
Absorbent pads	11,500 Nos
For Removal	Quantum (on Daily Basis)
Tractors with trailers	2 Nos
Hydracrane	3 Nos
Boats	110 Nos
Gully Suckers	5 – 8 Nos
Pickup trucks	4 Nos
Oil Skimmers	6 Nos
JCBs	7Nos
Poclain	4 – 6 Nos
Tippers	11 Nos

As a result of cleaning work for a span of 22 days i.e., from 12.12.2023 to 01.01.2024, a total of 2,20,040 litres of oil-water mixture and 663.5 tonnes of oil-laden soil and debris has been collected from the Buckingham Canal and Ennore Creek Areas. The collected oil mixed water & oil soaked debris are sent to CPCL for further treatment and scientific disposal.

10. Recommendations of the Team

After detailed inspection the team made the following recommendations.

Immediate measures

1. The CPCL shall take up study on flood management for entire premises to avoid such incident that no waste/product/raw material shall not be gushed out of their premises
2. The CPCL shall rise the height of all storage tanks of Storm water collection, effluent and sludge by considering worst situation of flood
3. The CPCL shall take up maintenance of crude oil tanks well before onset of monsoon and to complete the separation of oil as well as bio-remediation of sludge well before the monsoon.
4. The CPCL shall have preparedness plan in place to avoid such incidence in future
5. The CPCL shall fix the permanent booms/oil separators in the vulnerable areas including the outside of CPCL premises. Periodic maintenance should be undertaken before monsoon season.
6. The CPCL shall install sensors in the vulnerable area to give warnings.
7. The CPCL shall complete the cleaning operations in the Buckingham canal and Ennore creek area and take-up restoration flora and fauna.

Long Term measure

1. Improved Infrastructure Design: The CPCL shall enhance the design of storage tanks to withstand extreme weather events like floods. This could include elevated structures, reinforced containment walls, and waterproof sealing.
2. Flood Barriers and Containment Systems: The CPCL shall install flood barriers around critical areas to prevent water from reaching the tanks. Additionally, the unit shall have secondary containment systems that can prevent oil from spreading if a spillage occurs.
3. Regular Maintenance and Inspections: The CPCL shall ensure regular maintenance of all tanks including ETPs and pipelines to address any potential

vulnerabilities. This should include frequent inspections, especially before expected adverse weather conditions.

4. Advanced Monitoring Systems: The CPCL shall utilize technology like remote sensing and automated monitoring systems to detect early signs of leakages or structural weaknesses.

5. Emergency Response Plan: The CPCL shall develop and regularly update a comprehensive emergency response plan. This plan should include procedures for immediate containment and clean-up in case of a leakage.

6. Collaboration with Local Authorities: The CPCL shall work closely with local government authorities to align safety protocols and response strategies.

7. Regular Audits and Inspections:The CPCL shall conduct independent audits and inspections of oil facilities to ensure compliance with safety and environmental standards.

8. Public Awareness and Preparedness:The CPCL shall educate the local community about potential risks and emergency procedures in the event of an oil leakage.

9. Investment in Clean-up Technologies:The CPCL shall allocate resources for research and deployment of effective oil leakage clean-up technologies.

10. Partnerships for Environmental Conservation:The CPCL shall collaborate with NGOs and international bodies to protect and restore ecosystems like mangroves that are affected by oil leakages.

11. Environmental Clean-Up Initiatives:The CPCL shall take full responsibility for the clean-up operations, employing the best available technology to minimize the environmental impact.

12. Ecosystem Restoration Funds:The CPCL shall allocate funds specifically for the restoration of damaged ecosystems of B Canal and Ennore Creek and mangroves. This could involve cleaning operations, replanting mangroves, and rehabilitating wildlife.

Other industries

Other industries located along the Buckingham canal and Kosasthalairiver shall be directed to take following measures;

1. The unit shall prepare proper flood management plan to address the issues aroused in recent flood
2. The unit shall check the height of all tanks including raw material/product/waste(liquid & Solid)
3. The unit shall phase out all underground tanks of raw material/product/oil etc.,
4. The unit shall provide adequate drainage system

TNPCB

1. TNPCB shall workout the environmental compensation to be levied from M/s CPCL in consultation with CPCB immediately after the receipt of IIT Madras study report on the scientific assessment of environmental damage caused by this oil leakage incident including the finger printing of the oil and the quantification of oil that would have reached the water bodies.
2. TNPCB shall take immediate action to file a criminal case against the unit of M/s CPCL and its occupier for the violations of the conditions of the consent order issued under Water Act

DrG.Saravanan
Principal Scientist, CSIR-NEERI

Prof. V.T.Perarasu
Anna University

V.Kumar
Commandant, ICG

H.D.Varalaxmi
Scientist-E, RD, CPCB

R.Kannan
Member Secretary,
TNPCB

Annexure I

Formation of Technical Team

Environment - Constitution of a Technical team to ascertain the cause of the recent oil leak in the Ennore Creek Area – Orders - Issued

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Environment, Climate Change and Forests (EC3) Department

G.O.(Ms) No.178 **Dated: 10.12.2023**

சோபகிருது, கார்த்திகை–24

திருவள்ளுவர் ஆண்டு 2054

ORDER:

In order to ascertain the cause of the recent oil leak in the Ennore Creek area, the Government orders constitution of a Technical team with following Experts / Officers to find out the cause of the oil leak in the Ennore Creek area.

1. Thiru R.Kannan, Member Secretary, TNPCB - Chairman
2. Dr.G.Saravanan, Principal Scientist, Chennai Zonal Centre, CSIR-NEERI - Member
3. Ms.H.D.Varalaxmi, Scientist-E & Regional Director, Regional Directorate, Central Pollution Control Board, Chennai - Member
4. Thiru V. Kumar, Commandant, Indian Coast Guard – Member
5. Prof V.T.Perarasu, Department of Chemical Engineering, Anna University Chennai – Member

The technical team shall make a field to the CPCL premises and other related Industries in the forenoon of 11.12.2023 and submit their preliminary report before 4 p.m. on the same day so that it can be presented in the meeting of the State Oil Spill Crisis Management Group.

The Detailed Report shall be submitted by the Committee within 2 days from the date of issue of this Government Order.

(BY ORDER OF THE GOVERNOR)

SUPRIYA SAHU
ADDTIIONAL CHIEF SECRETARY TO GOVERNEMNT

To
The Chairperson, TNPCB, Chennai
Thiru R.Kannan, MS, TNPCB - Chairman

Dr.G.Saravanan, Principal Scientist,
Chennai Zonal Centre, CSIR-NEERI - Member

Ms.H.D.Varalaxmi, Scientist-E & Regional Director, Regional Directorate, Central Pollution Control Board, Chennai - Member

Thiru V. Kumar, Commandant, Indian Coast Guard – Member

Prof V.T.Perarasu, Department of Chemical Engineering, Anna University Chennai – Member

Copy to
The Senior Personal Assistant to Hon'ble Minister
(Environment and Climate Change), Chennai – 9.
PS to Chief Secretary to Government, Chennai – 9.
Ps to ACS/Secretary-I to C.M, Chennai – 9.
PS to ACS, ECCF Department, Chennai-9.
PS to Special Secretary, ECCF Department, Chennai-9
Stock file/spare copy

//FORWARDED BY ORDER//

SECTION OFFICER

Annexure II

ROA of water samples collected on 05/12/2023, 07/12/2023 and 09/12/2023

TAMIL NADU POLLUTION CONTROL BOARD

DISTRICT ENVIRONMENTAL LABORATORY – MANALI

REPORT OF ANALYSIS

R.O.A.No. 539/DEL-Manali Water Report 2023-2024 Dated:11.12.2023

1. Name of the Sender : JCEE-Chennai

2. Nature and Number of Sample(s): One number of sample

3. Date and Time of Collection :05.12.2023 at 03:45 PM

4.Point of Collection : JCEE 001/12-23 - @ Kosasthalai River near Thalankuppam Bridge

S. No.	Parameters	JCEE code	JCEE 001/12-23
		LAB code	1331
		Unit	
1.	pH		interference
2.	TSS	mg/l	interference
3.	TDS	mg/l	interference
4.	Chloride	mg/l	interference
5.	Sulphate	mg/l	interference
6.	BOD	mg/l	interference
7.	COD	mg/l	interference
8.	Phenolic Compounds	mg/l	48.4
9.	Oil & Grease	mg/l	828

Inteference : Oily sample

Odour : Heavy Oily smell

As per CPCB Standard – 10 mg/L (Inland surface water)

S. 12/23

Deputy Chief Scientific Officer(A/C)

for **DEL ,Manali**

TAMIL NADU POLLUTION CONTROL BOARD

DISTRICT ENVIRONMENTAL LABORATORY – MANALI

REPORT OF ANALYSIS

R.O.A.No. 540/DEL-Manali Water Report 2023-2024 Dated:11.12.2023

1. Name of the Sender : DEE-Ambattur

2. Nature and Number of Sample(s): Five number of sample

3. Date and Time of Collection : 07.12.2023 from 08:40 AM to 02.:30 PM

4.Point of Collection : KM/01/12 - Stagnant water @ Outlet of storm water drain near south gate of CPCL
KM/02/12 - Flowing water the culvert from the storm water drain near south gate of CPCL
KM/03/12 - Buckingham canal near the gate of Indian oil corporation limited, Tondiarpet Terminal
KM/04/12 - Ennore Creek Point 1
KM/05/12 - Ennore Creek Point 2

S. No.	Parameters	DEE code	KM-01/12	KM-02/12	KM-03/12	KM-04/12	KM-05/12
		LAB code	1332	1333	1334	1335	1336
		Unit					
1.	pH		Interference	7.82	7.91	8.15	7.45
2.	TSS	mg/l	182	24	32	36	72
3.	TDS	mg/l	interference				
4.	Chloride	mg/l	interference				
5.	Sulphate	mg/l	interference				
6.	BOD	mg/l	interference				
7.	COD	mg/l	interference				
8.	Phenolic Compounds	mg/l	18.6	10.2	14.6	22.3	28.3
9.	Oil & Grease	mg/l	230	42	28	86	158

Inteference : Oily sample

Odour : Heavy Oily smell

11/12/23

Deputy Chief Scientific Officer(A/C)
for DEL ,Manali

SGS

Test Report

TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.001-A-R01 **Issue Date** : 19/12/2023

ULR No : TC500623100005671F **JOE No** : CE23-002151

Report Control No : CER0000394772

Customer Provided Information

Sample Name : POND WATER
Customer Name : DISTRICT ENVIRONMENTAL ENGINEER TAMIL NADU POLLUTION CONTROL BOARD
Customer Address : TAMIL NADU POLLUTION CONTROL BOARD,
: 77A, SOUTH AVENUE ROAD, AMBATTUR INDUSTRIAL ESTATE,
City : AMBATTUR,
Postal Code : 600058
State : TAMIL NADU
Country : INDIA
Sample Qty. : 4 X 1L
Recd.
Sampling Date : 09.12.2023
Sample Location : POND A

Lab Provided Information

Sample Type : POND WATER

Received on : 11/12/2023
Registered on : 11/12/2023
Test Start-End Date : 11/12/2023 - 15/12/2023
Sampling Date : 09.12.2023

NABL Group : Water
NABL Sub Group : Surface Water

This Report cancels and supersedes the Report No CE23-002151.001 dated 12/13/2023 issued by SGS India

NABL Accredited Tests

Analysis	Method	Result	Unit
DISCIPLINE: CHEMICAL			
Polynuclear aromatic hydrocarbons (PAH)			
Naphthalene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Acenaphthlyene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Acenaphthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Fluorene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Phenanthrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(a)anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Chrysene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(b)fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(k)fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(a)pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Indeno(1,2,3-c,d)pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Dibenzo(a,h)anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L

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SGS

Test Report

TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.001-A-R01 **Issue Date** : 19/12/2023

ULR No : TC500623100005671F **JOE No** : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.001 dated 12/13/2023 issued by SGS India

NABL Accredited Tests

Analysis	Method	Result	Unit
Benzo(g,h,i)perylene	USEPA 8100 (by GC-MS)	<0.01	µg/L
*** Diesel Range Organics (DRO) (C10 to C28)**			
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	0.139	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.562	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	1.166	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.896	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	0.874	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	2.392	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	2.007	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.285	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	1.929	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.134	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	1.213	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.114	mg/L
n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.155	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.093	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.826	mg/L
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	1.086	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.649	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.501	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.469	mg/L
Total petroleum hydrocarbons (C8 to C28)			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	0.139	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.562	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	1.166	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.896	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	0.874	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	2.392	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	2.007	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.285	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	1.929	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.134	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	1.213	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.114	mg/L
n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.155	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.093	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.826	mg/L

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Test Report

TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.001-A-R01 **Issue Date** : 19/12/2023

ULR No : TC500623100005671F **JOE No** : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.001 dated 12/13/2023 issued by SGS India

NABL Accredited Tests

Analysis	Method	Result	Unit
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	1.086	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.649	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.501	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.469	mg/L
*** Gasoline range organics (GRO) (C8 to C10)**			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	0.139	mg/L
Total petroleum hydrocarbons (C8 to C40)			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	0.139	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.562	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	1.166	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.896	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	0.874	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	2.392	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	2.007	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.285	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	1.929	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.134	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	1.213	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.114	mg/L
n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.155	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.093	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.826	mg/L
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	1.086	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.649	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.501	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.469	mg/L
n-Nonacosane (C29)	USEPA 8015 B/NWTPH - HCID	0.063	mg/L
n-Triacontane (C30)	USEPA 8015 B/NWTPH - HCID	0.304	mg/L
n-Hentriacontane (C31)	USEPA 8015 B/NWTPH - HCID	0.068	mg/L
n-Dotriacontane (C32)	USEPA 8015 B/NWTPH - HCID	0.220	mg/L
n-Tritriacontane (C33)	USEPA 8015 B/NWTPH - HCID	0.066	mg/L
n-Tetratriacontane (C34)	USEPA 8015 B/NWTPH - HCID	0.167	mg/L
n-Pentatriacontane (C35)	USEPA 8015 B/NWTPH - HCID	0.665	mg/L
n-Hexatriacontane (C36)	USEPA 8015 B/NWTPH - HCID	1.030	mg/L
n-Heptatriacontane (C37)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L

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Test Report

TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.001-A-R01 **Issue Date** : 19/12/2023

ULR No : TC500623100005671F **JOE No** : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.001 dated 12/13/2023 issued by SGS India

NABL Accredited Tests

Analysis	Method	Result	Unit
n-Octatriacontane (C38)	USEPA 8015 B/NWTPH - HCID	0.076	mg/L
n-Nonatriacontane (C39)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Tetracontane (C40)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
Oil & Grease	APHA 5520 B - 23rd Edition : 2017 (Liquid-Liquid,Partition-Gravimetric method)	96	mg/L
Phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2-Chloro phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2-Methylphenol (o-Cresol)	USEPA 8041A (by GC-FID)	<0.025	mg/L
3-Methylphenol & 4-Methylphenol (m & p-Cresol)	USEPA 8041A (by GC-FID)	0.394	mg/L
2-Nitrophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4-Dimethylphenol	USEPA 8041A (by GC-FID)	0.123	mg/L
2,4-Dichloro phenol	USEPA 8041A (by GC-FID)	0.127	mg/L
2,5-Dichlorophenol	USEPA 8041A (by GC-FID)	0.035	mg/L
2,3-Dichlorophenol	USEPA 8041A (by GC-FID)	0.067	mg/L
3-Chlorophenol & 4-Chlorophenol	USEPA 8041A (by GC-FID)	0.127	mg/L
2,6-Dichlorophenol	USEPA 8041A (by GC-FID)	0.179	mg/L
2,3,5-Trichloro phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4,6-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4,5-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,4-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,6-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
3,5-Dichlorophenol	USEPA 8041A (by GC-FID)	0.170	mg/L
3,4-Dichlorophenol	USEPA 8041A (by GC-FID)	0.141	mg/L
2,4-Dinitrophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
4-Nitrophenol	USEPA 8041A (by GC-FID)	4.180	mg/L
2,3,5,6-Tetrachloro phenol	USEPA 8041A (by GC-FID)	0.151	mg/L
2,3,4,5-Tetrachlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,4,6-Tetrachlorophenol	USEPA 8041A (by GC-FID)	0.141	mg/L
2-Methyl-4,6-dinitrophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
3,4,5-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
Pentachlorophenol	USEPA 8041A (by GC-FID)	0.272	mg/L
Chlorobenzene	USEPA 5030C	<0.1	µg/L
1,3-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,4-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2,4-trichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2,3-trichlorobenzene	USEPA 5030C	<0.1	µg/L

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Test Report

TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.001-A-R01 **Issue Date** : 19/12/2023

ULR No : TC500623100005671F **JOE No** : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.001 dated 12/13/2023 issued by SGS India

NABL Accredited Tests

Analysis	Method	Result	Unit
Polychlorinated benzenes (Total: The sum of 6 individual compounds)	USEPA 5030C	<0.1	µg/L

Remark :

Per pro SGS India Private Ltd

K_MANOHARAN

Section Incharge

Authorized Signatory

****End of Report****

SGS India Pvt. Ltd. Multi Laboratory, 28 B/1 (SP), 28 B/2 (SP), IInd Main Road, Opposite to State Bank of India, Ambattur Industrial Estate, Chennai - 600 058, Tel: 91-44-66081600

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Test Report

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.001-B-R01

Issue Date : 19/12/2023

JOE No : CE23-002151

Report Control No : CER0000394772

Customer Provided Information

Sample Name	:	POND WATER
Customer Name	:	DISTRICT ENVIRONMENTAL ENGINEER TAMIL NADU POLLUTION CONTROL BOARD
Customer Address	:	TAMIL NADU POLLUTION CONTROL BOARD,
	:	77A, SOUTH AVENUE ROAD, AMBATTUR INDUSTRIAL ESTATE,
City	:	AMBATTUR,
Postal Code	:	600058
State	:	TAMIL NADU
Country	:	INDIA
Sample Qty.	:	4 X 1L
Recd. Sampling Date	:	09.12.2023
Sample Location	:	POND A

Lab Provided Information

Sample Type	:	POND WATER
Received on	:	11/12/2023
Registered on	:	11/12/2023
Test Start-End Date	:	11/12/2023 - 15/12/2023
Sampling Date	:	09.12.2023
NABL Group	:	Water
NABL Sub Group	:	Surface Water

This Report cancels and supersedes the Report No CE23-002151.001 dated 12/13/2023 issued by SGS India

Non-Accredited tests

Analysis	Method	Result	Unit
DISCIPLINE: CHEMICAL			
Total organic carbon	SO-IN-MUL-TE-158	131	mg/L

Remark :

Per pro SGS India Private Ltd

K_MANOHARAN

Section Incharge

Authorized Signatory

****End of Report****

SGS India Pvt. Ltd. Multi Laboratory, 28 B/1 (SP), 28 B/2 (SP), IInd Main Road, Opposite to State Bank of India, Ambattur Industrial Estate, Chennai - 600 058, Tel: 91-44-66081600

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Test Report

TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.002-A-R01 **Issue Date** : 19/12/2023

ULR No : TC500623100005672F **JOE No** : CE23-002151

Report Control No : CER0000394772

Customer Provided Information

Sample Name : POND WATER
Customer Name : DISTRICT ENVIRONMENTAL ENGINEER TAMIL NADU POLLUTION CONTROL BOARD
Customer Address : TAMIL NADU POLLUTION CONTROL BOARD,
: 77A, SOUTH AVENUE ROAD, AMBATTUR INDUSTRIAL ESTATE,
City : AMBATTUR,
Postal Code : 600058
State : TAMIL NADU
Country : INDIA
Sample Qty. : 4 X 1L
Recd.
Sampling Date : 09.12.2023
Sample Location : POND C

Lab Provided Information

Sample Type : POND WATER

Received on : 11/12/2023
Registered on : 11/12/2023
Test Start-End Date : 11/12/2023 - 15/12/2023
Sampling Date : 09.12.2023

NABL Group : Water
NABL Sub Group : Surface Water

This Report cancels and supersedes the Report No CE23-002151.002 dated 12/13/2023 issued by SGS India

NABL Accredited Tests

Analysis	Method	Result	Unit
DISCIPLINE: CHEMICAL			
Polynuclear aromatic hydrocarbons (PAH)			
Naphthalene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Acenaphthlyene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Acenaphthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Fluorene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Phenanthrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(a)anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Chrysene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(b)fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(k)fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(a)pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Indeno(1,2,3-c,d)pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Dibenzo(a,h)anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L

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Test Report

TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.002-A-R01 **Issue Date** : 19/12/2023

ULR No : TC500623100005672F **JOE No** : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.002 dated 12/13/2023 issued by SGS India

NABL Accredited Tests

Analysis	Method	Result	Unit
Benzo(g,h,i)perylene	USEPA 8100 (by GC-MS)	<0.01	µg/L
*** Diesel Range Organics (DRO) (C10 to C28)**			
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	0.158	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.380	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	0.835	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.605	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	1.581	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	2.825	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	2.220	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.171	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	2.192	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.104	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	1.086	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.091	mg/L
n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.396	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.065	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.911	mg/L
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	1.106	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.728	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.563	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.522	mg/L
Total petroleum hydrocarbons (C8 to C28)			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	0.158	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.380	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	0.835	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.605	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	1.581	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	2.825	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	2.220	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.171	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	2.192	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.104	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	1.086	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.091	mg/L
n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.396	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.065	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.911	mg/L

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Test Report

TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.002-A-R01 **Issue Date** : 19/12/2023

ULR No : TC500623100005672F **JOE No** : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.002 dated 12/13/2023 issued by SGS India

NABL Accredited Tests

Analysis	Method	Result	Unit
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	1.106	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.728	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.563	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.522	mg/L
*** Gasoline range organics (GRO) (C8 to C10)**			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	0.158	mg/L
Total petroleum hydrocarbons (C8 to C40)			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	0.158	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.380	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	0.835	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.605	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	1.581	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	2.825	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	2.220	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.171	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	2.192	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.104	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	1.086	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.091	mg/L
n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.396	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.065	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.911	mg/L
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	1.106	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.728	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.563	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.522	mg/L
n-Nonacosane (C29)	USEPA 8015 B/NWTPH - HCID	0.056	mg/L
n-Triacontane (C30)	USEPA 8015 B/NWTPH - HCID	0.342	mg/L
n-Hentriacontane (C31)	USEPA 8015 B/NWTPH - HCID	0.069	mg/L
n-Dotriacontane (C32)	USEPA 8015 B/NWTPH - HCID	0.242	mg/L
n-Tritriacontane (C33)	USEPA 8015 B/NWTPH - HCID	0.059	mg/L
n-Tetratriacontane (C34)	USEPA 8015 B/NWTPH - HCID	0.202	mg/L
n-Pentatriacontane (C35)	USEPA 8015 B/NWTPH - HCID	0.149	mg/L
n-Hexatriacontane (C36)	USEPA 8015 B/NWTPH - HCID	1.847	mg/L
n-Heptatriacontane (C37)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L

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Test Report

TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.002-A-R01 **Issue Date** : 19/12/2023

ULR No : TC500623100005672F **JOE No** : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.002 dated 12/13/2023 issued by SGS India

NABL Accredited Tests

Analysis	Method	Result	Unit
n-Octatriacontane (C38)	USEPA 8015 B/NWTPH - HCID	0.087	mg/L
n-Nonatriacontane (C39)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Tetracontane (C40)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
Oil & Grease	APHA 5520 B - 23rd Edition : 2017 (Liquid-Liquid,Partition-Gravimetric method)	81	mg/L
Phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2-Chloro phenol	USEPA 8041A (by GC-FID)	0.060	mg/L
2-Methylphenol (o-Cresol)	USEPA 8041A (by GC-FID)	<0.025	mg/L
3-Methylphenol & 4-Methylphenol (m & p-Cresol)	USEPA 8041A (by GC-FID)	0.347	mg/L
2-Nitrophenol	USEPA 8041A (by GC-FID)	0.148	mg/L
2,4-Dimethylphenol	USEPA 8041A (by GC-FID)	0.169	mg/L
2,4-Dichloro phenol	USEPA 8041A (by GC-FID)	0.104	mg/L
2,5-Dichlorophenol	USEPA 8041A (by GC-FID)	0.327	mg/L
2,3-Dichlorophenol	USEPA 8041A (by GC-FID)	0.121	mg/L
3-Chlorophenol & 4-Chlorophenol	USEPA 8041A (by GC-FID)	0.087	mg/L
2,6-Dichlorophenol	USEPA 8041A (by GC-FID)	0.126	mg/L
2,3,5-Trichloro phenol	USEPA 8041A (by GC-FID)	0.152	mg/L
2,4,6-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4,5-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,4-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,6-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
3,5-Dichlorophenol	USEPA 8041A (by GC-FID)	0.733	mg/L
3,4-Dichlorophenol	USEPA 8041A (by GC-FID)	0.203	mg/L
2,4-Dinitrophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
4-Nitrophenol	USEPA 8041A (by GC-FID)	6.692	mg/L
2,3,5,6-Tetrachloro phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,4,5-Tetrachlorophenol	USEPA 8041A (by GC-FID)	0.072	mg/L
2,3,4,6-Tetrachlorophenol	USEPA 8041A (by GC-FID)	0.591	mg/L
2-Methyl-4,6-dinitrophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
3,4,5-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
Pentachlorophenol	USEPA 8041A (by GC-FID)	0.639	mg/L
Chlorobenzene	USEPA 5030C	<0.1	µg/L
1,3-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,4-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2,4-trichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2,3-trichlorobenzene	USEPA 5030C	<0.1	µg/L

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Test Report

TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.002-A-R01 **Issue Date** : 19/12/2023

ULR No : TC500623100005672F **JOE No** : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.002 dated 12/13/2023 issued by SGS India

NABL Accredited Tests

Analysis	Method	Result	Unit
Polychlorinated benzenes (Total: The sum of 6 individual compounds)	USEPA 5030C	<0.1	µg/L

Remark :

Per pro SGS India Private Ltd

K_MANOHARAN

Section Incharge

Authorized Signatory

****End of Report****

SGS India Pvt. Ltd. Multi Laboratory, 28 B/1 (SP), 28 B/2 (SP), IInd Main Road, Opposite to State Bank of India, Ambattur Industrial Estate, Chennai - 600 058, Tel: 91-44-66081600

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Test Report

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.002-B-R01

Issue Date : 19/12/2023

JOE No : CE23-002151

Report Control No : CER0000394772

Customer Provided Information

Sample Name : POND WATER
Customer Name : DISTRICT ENVIRONMENTAL ENGINEER TAMIL NADU POLLUTION CONTROL BOARD
Customer Address : TAMIL NADU POLLUTION CONTROL BOARD,
: 77A, SOUTH AVENUE ROAD, AMBATTUR INDUSTRIAL ESTATE,
City : AMBATTUR,
Postal Code : 600058
State : TAMIL NADU
Country : INDIA
Sample Qty. : 4 X 1L
Recd.
Sampling Date : 09.12.2023
Sample Location : POND C

Lab Provided Information

Sample Type : POND WATER

Received on : 11/12/2023
Registered on : 11/12/2023
Test Start-End Date : 11/12/2023 - 15/12/2023
Sampling Date : 09.12.2023

NABL Group : Water
NABL Sub Group : Surface Water

This Report cancels and supersedes the Report No CE23-002151.002 dated 12/13/2023 issued by SGS India

Non-Accredited tests

Analysis	Method	Result	Unit
DISCIPLINE: CHEMICAL			
Total organic carbon	SO-IN-MUL-TE-158	248	mg/L

Remark :

Per pro SGS India Private Ltd

K_MANOHARAN

Section Incharge

Authorized Signatory

****End of Report****

SGS India Pvt. Ltd.

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Test Report

TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.003-A-R01 **Issue Date** : 19/12/2023

ULR No : TC500623100005673F **JOE No** : CE23-002151

Report Control No : CER0000394772

Customer Provided Information

Sample Name : POND WATER
Customer Name : DISTRICT ENVIRONMENTAL ENGINEER TAMIL NADU POLLUTION CONTROL BOARD
Customer Address : TAMIL NADU POLLUTION CONTROL BOARD,
: 77A, SOUTH AVENUE ROAD, AMBATTUR INDUSTRIAL ESTATE,
City : AMBATTUR,
Postal Code : 600058
State : TAMIL NADU
Country : INDIA
Sample Qty. : 2.5L
Recd.
Sampling Date : 09.12.2023
Sample Location : POND E INLET

Lab Provided Information

Sample Type : POND WATER

Received on : 11/12/2023
Registered on : 11/12/2023
Test Start-End Date : 11/12/2023 - 15/12/2023
Sampling Date : 09.12.2023

NABL Group : Water
NABL Sub Group : Surface Water

This Report cancels and supersedes the Report No CE23-002151.003 dated 12/13/2023 issued by SGS India

NABL Accredited Tests

Analysis	Method	Result	Unit
DISCIPLINE: CHEMICAL			
Polynuclear aromatic hydrocarbons (PAH)			
Naphthalene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Acenaphthlyene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Acenaphthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Fluorene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Phenanthrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(a)anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Chrysene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(b)fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(k)fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(a)pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Indeno(1,2,3-c,d)pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Dibenzo(a,h)anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L

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Test Report

TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.003-A-R01 **Issue Date** : 19/12/2023

ULR No : TC500623100005673F **JOE No** : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.003 dated 12/13/2023 issued by SGS India

NABL Accredited Tests

Analysis	Method	Result	Unit
Benzo(g,h,i)perylene	USEPA 8100 (by GC-MS)	<0.01	µg/L
*** Diesel Range Organics (DRO) (C10 to C28)**			
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.162	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	0.046	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.071	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	0.135	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	1.196	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	1.056	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.086	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	1.775	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.051	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	0.860	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.045	mg/L
n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.322	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.050	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.867	mg/L
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	1.142	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.697	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.636	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.501	mg/L
Total petroleum hydrocarbons (C8 to C28)			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.162	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	0.046	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.071	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	0.135	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	1.196	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	1.056	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.086	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	1.775	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.051	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	0.860	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.045	mg/L
n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.322	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.050	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.867	mg/L

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Test Report

TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.003-A-R01 **Issue Date** : 19/12/2023

ULR No : TC500623100005673F **JOE No** : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.003 dated 12/13/2023 issued by SGS India

NABL Accredited Tests

Analysis	Method	Result	Unit
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	1.142	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.697	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.636	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.501	mg/L
*** Gasoline range organics (GRO) (C8 to C10)**			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
Total petroleum hydrocarbons (C8 to C40)			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.162	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	0.046	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.071	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	0.135	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	1.196	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	1.056	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.086	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	1.775	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.051	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	0.860	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.045	mg/L
n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.322	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.050	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.867	mg/L
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	1.142	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.697	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.636	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.501	mg/L
n-Nonacosane (C29)	USEPA 8015 B/NWTPH - HCID	0.054	mg/L
n-Triacontane (C30)	USEPA 8015 B/NWTPH - HCID	0.323	mg/L
n-Hentriacontane (C31)	USEPA 8015 B/NWTPH - HCID	0.064	mg/L
n-Dotriacontane (C32)	USEPA 8015 B/NWTPH - HCID	0.231	mg/L
n-Tritriacontane (C33)	USEPA 8015 B/NWTPH - HCID	0.050	mg/L
n-Tetratriacontane (C34)	USEPA 8015 B/NWTPH - HCID	0.194	mg/L
n-Pentatriacontane (C35)	USEPA 8015 B/NWTPH - HCID	1.315	mg/L
n-Hexatriacontane (C36)	USEPA 8015 B/NWTPH - HCID	0.329	mg/L
n-Heptatriacontane (C37)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L

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Test Report

TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.003-A-R01 **Issue Date** : 19/12/2023

ULR No : TC500623100005673F **JOE No** : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.003 dated 12/13/2023 issued by SGS India

NABL Accredited Tests

Analysis	Method	Result	Unit
n-Octatriacontane (C38)	USEPA 8015 B/NWTPH - HCID	0.084	mg/L
n-Nonatriacontane (C39)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Tetracontane (C40)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
Oil & Grease	APHA 5520 B - 23rd Edition : 2017 (Liquid-Liquid,Partition-Gravimetric method)	50	mg/L
Phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2-Chloro phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2-Methylphenol (o-Cresol)	USEPA 8041A (by GC-FID)	<0.025	mg/L
3-Methylphenol & 4-Methylphenol (m & p-Cresol)	USEPA 8041A (by GC-FID)	<0.025	mg/L
2-Nitrophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4-Dimethylphenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4-Dichloro phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,5-Dichlorophenol	USEPA 8041A (by GC-FID)	0.139	mg/L
2,3-Dichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
3-Chlorophenol & 4-Chlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,6-Dichlorophenol	USEPA 8041A (by GC-FID)	0.102	mg/L
2,3,5-Trichloro phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4,6-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4,5-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,4-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,6-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
3,5-Dichlorophenol	USEPA 8041A (by GC-FID)	1.517	mg/L
3,4-Dichlorophenol	USEPA 8041A (by GC-FID)	0.263	mg/L
2,4-Dinitrophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
4-Nitrophenol	USEPA 8041A (by GC-FID)	3.397	mg/L
2,3,5,6-Tetrachloro phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,4,5-Tetrachlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,4,6-Tetrachlorophenol	USEPA 8041A (by GC-FID)	1.301	mg/L
2-Methyl-4,6-dinitrophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
3,4,5-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
Pentachlorophenol	USEPA 8041A (by GC-FID)	2.237	mg/L
Chlorobenzene	USEPA 5030C	<0.1	µg/L
1,3-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,4-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2,4-trichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2,3-trichlorobenzene	USEPA 5030C	<0.1	µg/L

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Test Report

TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.003-A-R01 **Issue Date** : 19/12/2023

ULR No : TC500623100005673F **JOE No** : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.003 dated 12/13/2023 issued by SGS India

NABL Accredited Tests

Analysis	Method	Result	Unit
Polychlorinated benzenes (Total: The sum of 6 individual compounds)	USEPA 5030C	<0.1	µg/L

Remark :

Per pro SGS India Private Ltd

K_MANOHARAN

Section Incharge

Authorized Signatory

****End of Report****

SGS India Pvt. Ltd. Multi Laboratory, 28 B/1 (SP), 28 B/2 (SP), IInd Main Road, Opposite to State Bank of India, Ambattur Industrial Estate, Chennai - 600 058, Tel: 91-44-66081600

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Test Report

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.003-B-R01

Issue Date : 19/12/2023

JOE No : CE23-002151

Report Control No : CER0000394772

Customer Provided Information

Sample Name : POND WATER
Customer Name : DISTRICT ENVIRONMENTAL ENGINEER TAMIL NADU POLLUTION CONTROL BOARD
Customer Address : TAMIL NADU POLLUTION CONTROL BOARD,
: 77A, SOUTH AVENUE ROAD, AMBATTUR INDUSTRIAL ESTATE,
City : AMBATTUR,
Postal Code : 600058
State : TAMIL NADU
Country : INDIA
Sample Qty. : 2.5L
Recd.
Sampling Date : 09.12.2023
Sample Location : POND E INLET

Lab Provided Information

Sample Type : POND WATER

Received on : 11/12/2023
Registered on : 11/12/2023
Test Start-End Date : 11/12/2023 - 15/12/2023
Sampling Date : 09.12.2023

NABL Group : Water
NABL Sub Group : Surface Water

This Report cancels and supersedes the Report No CE23-002151.003 dated 12/13/2023 issued by SGS India

Non-Accredited tests

Analysis	Method	Result	Unit
DISCIPLINE: CHEMICAL			
Total organic carbon	SO-IN-MUL-TE-158	262	mg/L

Remark :

Per pro SGS India Private Ltd

K_MANOHARAN

Section Incharge

Authorized Signatory

****End of Report****

SGS India Pvt. Ltd. Multi Laboratory, 28 B/1 (SP), 28 B/2 (SP), IInd Main Road, Opposite to State Bank of India, Ambattur Industrial Estate, Chennai - 600 058, Tel: 91-44-66081600

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Test Report

TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.004-A-R01 **Issue Date** : 19/12/2023

ULR No : TC500623100005674F **JOE No** : CE23-002151

Report Control No : CER0000394772

Customer Provided Information

Sample Name : POND WATER
Customer Name : DISTRICT ENVIRONMENTAL ENGINEER TAMIL NADU POLLUTION CONTROL BOARD
Customer Address : TAMIL NADU POLLUTION CONTROL BOARD,
: 77A, SOUTH AVENUE ROAD, AMBATTUR INDUSTRIAL ESTATE,
City : AMBATTUR,
Postal Code : 600058
State : TAMIL NADU
Country : INDIA
Sample Qty. : 2.5L
Recd.
Sampling Date : 09.12.2023
Sample Location : POND E OUTLET

Lab Provided Information

Sample Type : POND WATER

Received on : 11/12/2023
Registered on : 11/12/2023
Test Start-End Date : 11/12/2023 - 15/12/2023
Sampling Date : 09.12.2023

NABL Group : Water
NABL Sub Group : Surface Water

This Report cancels and supersedes the Report No CE23-002151.004 dated 12/13/2023 issued by SGS India

NABL Accredited Tests

Analysis	Method	Result	Unit
DISCIPLINE: CHEMICAL			
Polynuclear aromatic hydrocarbons (PAH)			
Naphthalene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Acenaphthlyene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Acenaphthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Fluorene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Phenanthrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(a)anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Chrysene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(b)fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(k)fluoranthene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Benzo(a)pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Indeno(1,2,3-c,d)pyrene	USEPA 8100 (by GC-MS)	<0.01	µg/L
Dibenzo(a,h)anthracene	USEPA 8100 (by GC-MS)	<0.01	µg/L

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Test Report

TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.004-A-R01 **Issue Date** : 19/12/2023

ULR No : TC500623100005674F **JOE No** : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.004 dated 12/13/2023 issued by SGS India

NABL Accredited Tests

Analysis	Method	Result	Unit
Benzo(g,h,i)perylene	USEPA 8100 (by GC-MS)	<0.01	µg/L
*** Diesel Range Organics (DRO) (C10 to C28)**			
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.154	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	0.093	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.071	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	0.967	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	2.276	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	1.857	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.089	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	1.822	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.051	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	1.058	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.062	mg/L
n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.166	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.049	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.761	mg/L
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	0.947	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.597	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.495	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.435	mg/L
Total petroleum hydrocarbons (C8 to C28)			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.154	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	0.093	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.071	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	0.967	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	2.276	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	1.857	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.089	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	1.822	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.051	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	1.058	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.062	mg/L
n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.166	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.049	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.761	mg/L

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Test Report

TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.004-A-R01 **Issue Date** : 19/12/2023

ULR No : TC500623100005674F **JOE No** : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.004 dated 12/13/2023 issued by SGS India

NABL Accredited Tests

Analysis	Method	Result	Unit
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	0.947	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.597	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.495	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.435	mg/L
*** Gasoline range organics (GRO) (C8 to C10)**			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
Total petroleum hydrocarbons (C8 to C40)			
n-Octane (C8)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Nonane (C9)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Decane (C10)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Undecane (C11)	USEPA 8015 B/NWTPH - HCID	0.154	mg/L
n-Dodecane (C12)	USEPA 8015 B/NWTPH - HCID	0.093	mg/L
n-Tridecane (C13)	USEPA 8015 B/NWTPH - HCID	0.071	mg/L
n-Tetradecane (C14)	USEPA 8015 B/NWTPH - HCID	0.967	mg/L
n-Pentadecane (C15)	USEPA 8015 B/NWTPH - HCID	2.276	mg/L
n-Hexadecane (C16)	USEPA 8015 B/NWTPH - HCID	1.857	mg/L
n-Heptadecane (C17)	USEPA 8015 B/NWTPH - HCID	0.089	mg/L
n-Octadecane (C18)	USEPA 8015 B/NWTPH - HCID	1.822	mg/L
n-Nonadecane (C19)	USEPA 8015 B/NWTPH - HCID	0.051	mg/L
n-Eicosane (C20)	USEPA 8015 B/NWTPH - HCID	1.058	mg/L
n-Heneicosane (C21)	USEPA 8015 B/NWTPH - HCID	0.062	mg/L
n-Docosane (C22)	USEPA 8015 B/NWTPH - HCID	1.166	mg/L
n-Tricosane (C23)	USEPA 8015 B/NWTPH - HCID	0.049	mg/L
n-Tetracosane (C24)	USEPA 8015 B/NWTPH - HCID	0.761	mg/L
n-Pentacosane (C25)	USEPA 8015 B/NWTPH - HCID	0.947	mg/L
n-Hexacosane (C26)	USEPA 8015 B/NWTPH - HCID	0.597	mg/L
n-Heptacosane (C27)	USEPA 8015 B/NWTPH - HCID	0.495	mg/L
n-Octacosane (C28)	USEPA 8015 B/NWTPH - HCID	0.435	mg/L
n-Nonacosane (C29)	USEPA 8015 B/NWTPH - HCID	0.049	mg/L
n-Triacontane (C30)	USEPA 8015 B/NWTPH - HCID	0.282	mg/L
n-Hentriacontane (C31)	USEPA 8015 B/NWTPH - HCID	0.063	mg/L
n-Dotriacontane (C32)	USEPA 8015 B/NWTPH - HCID	0.203	mg/L
n-Tritriacontane (C33)	USEPA 8015 B/NWTPH - HCID	0.043	mg/L
n-Tetratriacontane (C34)	USEPA 8015 B/NWTPH - HCID	0.153	mg/L
n-Pentatriacontane (C35)	USEPA 8015 B/NWTPH - HCID	1.729	mg/L
n-Hexatriacontane (C36)	USEPA 8015 B/NWTPH - HCID	0.398	mg/L
n-Heptatriacontane (C37)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L

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Test Report

TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.004-A-R01 **Issue Date** : 19/12/2023

ULR No : TC500623100005674F **JOE No** : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.004 dated 12/13/2023 issued by SGS India

NABL Accredited Tests

Analysis	Method	Result	Unit
n-Octatriacontane (C38)	USEPA 8015 B/NWTPH - HCID	0.070	mg/L
n-Nonatriacontane (C39)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
n-Tetracontane (C40)	USEPA 8015 B/NWTPH - HCID	<0.025	mg/L
Oil & Grease	APHA 5520 B - 23rd Edition : 2017 (Liquid-Liquid,Partition-Gravimetric method)	46	mg/L
Phenol	USEPA 8041A (by GC-FID)	0.189	mg/L
2-Chloro phenol	USEPA 8041A (by GC-FID)	0.093	mg/L
2-Methylphenol (o-Cresol)	USEPA 8041A (by GC-FID)	<0.025	mg/L
3-Methylphenol & 4-Methylphenol (m & p-Cresol)	USEPA 8041A (by GC-FID)	<0.025	mg/L
2-Nitrophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4-Dimethylphenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4-Dichloro phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,5-Dichlorophenol	USEPA 8041A (by GC-FID)	0.589	mg/L
2,3-Dichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
3-Chlorophenol & 4-Chlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,6-Dichlorophenol	USEPA 8041A (by GC-FID)	0.152	mg/L
2,3,5-Trichloro phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4,6-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,4,5-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,4-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,6-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
3,5-Dichlorophenol	USEPA 8041A (by GC-FID)	0.759	mg/L
3,4-Dichlorophenol	USEPA 8041A (by GC-FID)	0.136	mg/L
2,4-Dinitrophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
4-Nitrophenol	USEPA 8041A (by GC-FID)	4.117	mg/L
2,3,5,6-Tetrachloro phenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
2,3,4,5-Tetrachlorophenol	USEPA 8041A (by GC-FID)	0.056	mg/L
2,3,4,6-Tetrachlorophenol	USEPA 8041A (by GC-FID)	0.776	mg/L
2-Methyl-4,6-dinitrophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
3,4,5-Trichlorophenol	USEPA 8041A (by GC-FID)	<0.025	mg/L
Pentachlorophenol	USEPA 8041A (by GC-FID)	0.655	mg/L
Chlorobenzene	USEPA 5030C	<0.1	µg/L
1,3-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,4-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2-dichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2,4-trichlorobenzene	USEPA 5030C	<0.1	µg/L
1,2,3-trichlorobenzene	USEPA 5030C	<0.1	µg/L

SGS India Pvt. Ltd. Multi Laboratory, 28 B/1 (SP), 28 B/2 (SP), IInd Main Road, Opposite to State Bank of India, Ambattur Industrial Estate, Chennai - 600 058, Tel: 91-44-66081600

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Member of the SGS Group (SGS SA)

Test Report

TC-5006

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.004-A-R01 **Issue Date** : 19/12/2023

ULR No : TC500623100005674F **JOE No** : CE23-002151

Report Control No : CER0000394772

This Report cancels and supersedes the Report No CE23-002151.004 dated 12/13/2023 issued by SGS India

NABL Accredited Tests

Analysis	Method	Result	Unit
Polychlorinated benzenes (Total: The sum of 6 individual compounds)	USEPA 5030C	<0.1	µg/L

Remark :

Per pro SGS India Private Ltd

K_MANOHARAN

Section Incharge

Authorized Signatory

****End of Report****

SGS India Pvt. Ltd. Multi Laboratory, 28 B/1 (SP), 28 B/2 (SP), IInd Main Road, Opposite to State Bank of India, Ambattur Industrial Estate, Chennai - 600 058, Tel: 91-44-66081600

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Test Report

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : CE23-002151.004-B-R01

Issue Date : 19/12/2023

JOE No : CE23-002151

Report Control No : CER0000394772

Customer Provided Information

Sample Name	:	POND WATER
Customer Name	:	DISTRICT ENVIRONMENTAL ENGINEER TAMIL NADU POLLUTION CONTROL BOARD
Customer Address	:	TAMIL NADU POLLUTION CONTROL BOARD,
	:	77A, SOUTH AVENUE ROAD, AMBATTUR INDUSTRIAL ESTATE,
City	:	AMBATTUR,
Postal Code	:	600058
State	:	TAMIL NADU
Country	:	INDIA
Sample Qty. Recd.	:	2.5L
Sampling Date	:	09.12.2023
Sample Location	:	POND E OUTLET

Lab Provided Information

Sample Type	:	POND WATER
Received on	:	11/12/2023
Registered on	:	11/12/2023
Test Start-End Date	:	11/12/2023 - 15/12/2023
Sampling Date	:	09.12.2023
NABL Group	:	Water
NABL Sub Group	:	Surface Water

This Report cancels and supersedes the Report No CE23-002151.004 dated 12/13/2023 issued by SGS India

Non-Accredited tests

Analysis	Method	Result	Unit
DISCIPLINE: CHEMICAL			
Total organic carbon	SO-IN-MUL-TE-158	102	mg/L

Remark :

Per pro SGS India Private Ltd

K_MANOHARAN

Section Incharge

Authorized Signatory

****End of Report****

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