



No. NCSCM / NGT / Tamil Nadu / 23 -339/EDC

dated 25/07/2023

To

The Registrar, ✓  
Hon'ble National Green Tribunal,  
Principal Bench,  
New Delhi.  
(email: judicial-ngt@gov.in)

Sir,

SUB: SUBMISSION OF REPORT BY THE JOINT COMMITTEE IN THE MATTER OF OA NO. 205/2023 IN THE HON'BLE NGT (PRINCIPAL BENCH), NEW DELHI.

Ref: NGT Order dated 28/03/2023 in OA No. 205/2023 regarding the Oil Spill reported at Thethi Nagar Beach, Nagore Coast, Nagapattinam, Tamil Nadu.

With reference to Order dated 28/03/2023 of the Hon'ble NGT cited above, the report of the Joint Committee in the matter of OA No. 205/2023 in the Hon'ble NGT (Principal Bench), New Delhi, is submitted herewith by email, as directed.

A copy of the report is also provided simultaneously to CPCL vide endorsement below, as directed.

Yours Faithfully,

Dr. Purvaja Ramachandran,  
Director, NCSCM  
(Nodal Agency)

Encl: Report of the Joint Committee in the matter of OA No. 205/2023.

Copy to: M/s Chennai Petroleum Corporation Limited, Panangudi village, Nagapattinam district, Tamil Nadu – 611 002, together with a copy of the report of the Joint Committee in the matter of OA No. 205/2023, by email.

(email: [da@cpcl.co.in](mailto:da@cpcl.co.in), [shankarp@cpcl.co.in](mailto:shankarp@cpcl.co.in), [sld@cpcl.co.in](mailto:sld@cpcl.co.in)).



**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL  
PRINCIPAL BENCH, NEW DELHI IN ORIGINAL APPLICATION NO. 205/2023**

**Report of the Joint Committee on “Assessment of the M/s Chennai Petroleum Corporation Limited-Cauvery Basin Refinery (CPCL CBR) - Nagapattinum Crude Oil Pipeline Leak near Nagore Coast, Nagapattinam, Tamil Nadu”.**

**July - 2023**

**Report of the Joint Committee on “Assessment of the M/s Chennai Petroleum Corporation Limited-Cauvery Basin Refinery (CPCL CBR) - Nagapattinam Crude Oil Pipeline Leak near Nagore Coast, Nagapattinam, Tamil Nadu”.**

**1. Background:**

The Hon’ble National Green Tribunal -Principal Bench (NGT), New Delhi, filed a Suo Motu Case OA 205/2023 based on the news item published in The Times of India Newspaper dated March 7, 2023 titled “*Oil leaked in Tamil Nadu’s Nagai spreading along the coast, say experts*”. The news item is based on the advisory of the Indian National Centre for Ocean Information Services (INCOIS), Hyderabad, which undertook a simulation study about the incident. Proceedings were initiated in this matter by the Hon’ble NGT (Principal Bench), New Delhi, and the first hearing was held on March 28, 2023.

The Hon’ble NGT Order dated March 28, 2023 of the Hon’ble NGT (Principal Bench), New Delhi, stated that “while it is true, that as per the stand of the Indian Coast Guard (ICG) and M/s Chennai Petroleum Corporation Limited, Cauvery Basin Refinery – (CPCL-CBR), there is not much damage to the water due to the incident of the oil spill, we find it necessary to direct an investigation to ascertain whether any remedial measures are required”. In that order, NGT directed the constitution of a Joint Committee comprising representatives from the Central Pollution Control Board (CPCB), Tamil Nadu Pollution Control Board (TNPCB), District Magistrate, Nagapattinam, Indian National Centre for Ocean Information Services (INCOIS), Hyderabad and National Centre for Sustainable Coastal Management (NCSCM), Chennai. NCSCM as a nodal agency for coordination and compliance with the report.

**2. Composition of the joint committee**

As per the Hon’ble NGT Order dated March 28, 2023 solicited nominations from all the concerned agencies, and accordingly, the following members were nominated by the concerned organizations to serve as members of this joint committee, as stated in Table 1.

The Hon’ble NGT Principal Bench, New Delhi, in its order dated March 28, 2023 ordered the Joint Committee to undertake a site visit and interact with other stakeholders and in particular, to undertake a safety audit and examine the pipeline in question to find out whether the crack was

due to corrosion on account of non-maintenance. As per the order, it will be open to the Committee to consider the studies already undertaken and also to seek the assistance of experts/institutions.

Table 1. Details of the nominated expert members from the various institutions are provided as follows:

<b>Sl. No.</b>	<b>Organization</b>	<b>Nominated member</b>
1	District Magistrate- Nagapattinam. Tamil Nadu	<b>Dr. A. Arun Thamburaj,</b> I.A.S, District Collector, Nagapattinam
2	Indian National Centre for Ocean Information Services (INCOIS), Ministry of Earth Sciences, Government of India "Ocean Valley", Pragathi Nagar (BO), Nizampet (SO), Hyderabad	<b>Dr. Sudheer Joseph,</b> Scientist- G and Division Head, Applied Research and Research to Operations (ARO), INCOIS, Hyderabad
3	Central Pollution Control Board (CPCB) Ministry of Environment, Forest & Climate Change, Regional Directorate - Chennai	<b>Er. Poornima BM,</b> Scientist D, CPCB, Chennai, Tamil Nadu
4	Tamil Nadu Pollution Control Board (TNPCB) State Government of Tamil Nadu Chennai.	<b>Er. V. Thamiloli,</b> District Environmental Engineer, TNPCB, Nagapattinam,
5	National Centre for Sustainable Coastal Management (NCSCM), Ministry of Environment, Forest and Climate Change of India (MoEF& CC), Government of India, Chennai	<b>Dr. G. Hariharan,</b> Scientist- C, Coastal Environmental Impact Assessment (CIA) Divisions- NCSCM

### **3. Mandate of the joint committee**

The Committee considered the following issues mentioned in the Hon'ble NGT order dated March 28, 2023 for deliberations and for submitting the report to the Hon'ble NGT.

- 1) To undertake a site visit.
- 2) To interact with Stakeholders.
- 3) To undertake a safety audit and examine the pipeline in question to find out whether the crack was due to corrosion on account of non-maintenance.

- 4) Assessment of damage to the coastal and marine environment due to the impact, if any, of the oil spill.
- 5) The required remedial measures.
- 6) Recommendations on remedial measures to be undertaken by CPCL.

#### 4. Approach adopted by the joint committee

The Joint Committee had a meeting in the office of the District Collector and Magistrate, Nagapattinam, Tamil Nadu, on April 18, 2023, and discussed the above issues in detail. The Joint Committee conducted an intensive field investigation, such as examining the physical characteristics of the coast, the pipeline, remedial measures required or undertaken, and the observation of spill patches away from the spill location. The committee also discussed the occurrence of the incident and its first notification information at the site, as well as the spill's impact on the local community and all other stakeholders.



Figure: 1. Photograph taken during the Joint Committee meeting at the office of the District Collector- Nagapattinam and interaction with Stakeholders.

The Joint Committee visited the site at Pattinacherry, Nagore Coast, Nagapattinam, Tamil Nadu, and nearby coastal areas to get first-hand information on the incident happened on 2<sup>nd</sup> March 18, 2023. The Joint Committee interacted with various Stakeholders, including fishermen and CPCL officials during the site visit.



Figure: 2. Field photograph taken during the site visit by the NGT committee members and interaction with Stakeholders.

During the site inspection of the Joint Committee, concerned officials including CPCL, Tamil Nadu Police, Panchayat, and Municipal representative were also presented and gathered the requisite information. Based on the information gathered and the observations, the joint committee prepared a report, which is submitted for the kind consideration of the Honourable NGT.

## 5. Interaction with residents of Pattinacherry Village

The Joint Committee interacted with various stakeholders, such as the Councilor of Pattinacherry Village, the Fishermen Panchayat, and residents of Pattinacherry village, etc. The deliberations of the Committee on the above issues are detailed below.

- a) Village leaders informed CPCL that the leak happened around 06.50 PM on March 2, 2023. They further added that District Authorities and CPCL Officials came around 07.30 PM on March 2, 2023.
- b) The Fishermen Panchayat insisted that the district and CPCL authorities initiate the necessary action to arrest the leak. The oil leak was noticed on March 2, 2023, intermittently in small quantities. Also, they said that a clamp was provided on March 3, 2023, and Leak was arrested on March 4, 2023, early in the morning.
- c) The Fishermen Panchayat was informed that the line was initially away from the coastal area. Due to sea advancement, coastal water came close to the pipeline and the line got exposed recently due to soil erosion.
- d) It was informed that the first meeting with residents of Pattinacherry village was held on March 6, 2023, wherein the fishermen's community agreed to go for fishing. During the second meeting held on March 16, 2023, CPCL agreed to remove the crude line before May 31, 2023. CPCL initiated and removed the crude pipeline on April 18, 2023. The villagers thanked and acknowledged the district authorities and CPCL officials for their speedy response.

## 6. Interaction with CPCL Officials

Subsequently, the joint Committee interacted with CPCL Officials who informed the following to the committee members.

- a) CPCL's Cauvery Basin Refinery (CBR), located at Nagapattinam, was commissioned in 1993 for refining Narimanam crude oil from M/s ONGC. In order to increase the capacity of the refinery, this 20" Crude Oil pipeline was laid in the year 2003 to source the other

crudes by importing. The Refinery operations were stopped on April 1<sup>st</sup>, 2019 due to limitations in meeting product specifications corresponding to BS-VI.

- b) After CBR refinery operations were stopped, the crude received from M/s ONGC was collected in crude tanks located inside the refinery premises, and the same was transferred through the crude pipeline to cargo ships at Karaikkal port. The Crude oil Pipeline is used once every 45 to 50 days for transferring crude oil from CPCL tanks in the refinery to Karaikal Port. The last such consignment was completed on February 14, 2023, and the crude oil pipeline has been in idle condition since February 15, 2023.
- c) The information on the crude pipeline leak was received around 06.50 PM on March 2, 2023. Immediately, CPCL informed concerned officials such as District Authorities, the TNPCB, the Tamil Nadu Maritime Board, the Indian Coast Guard, etc.
- d) Temporary shore and a temporary sand bund wall were created near the leaky spot of the pipeline to arrest the leak and also to prevent any possibility of oil ingress into the coast. On March 3, 2023, by 15.00 Hrs., a metal clamp was fastened to the pipeline, and on March 4, 2023, by 02.30 Hrs., the leak was arrested completely. Subsequently, online sealing was also carried out at the clamped portion, for additional safety.
- e) M/s Indian Oil Corporation Limited – Southern Region Pipelines and CPCL operated the Mobile Oil Spill Recovery Unit (MOSRU) and recovered the crude oil from onshore. A temporary pit was dug and collected the contaminated crude oil spread over the seashore during external clamping and gasket sealing of the damaged portion. M/s CPCL–CBR has handed over the oil along with seawater collected from the temporary pit to M/s Oil and Natural Gas Corporation (ONGC) Group Gathering Station, Narimanam, for the recovery of oil and also for further treatment of wastewater.

## **7. Safety Audit and examination of the pipeline**

During the committee site visit on April 18, 2023, the committee observed that the leaky portion of the pipeline was removed and kept aside. The clamp provided in the pipeline was not removed. The remaining portion of the base pipeline was found intact with very little damage to the external coating of the pipeline. CPCL officials explained that the damage to the coating material happened

during the removal and shifting of the pipeline by crane and sling. The visual inspection inside the pipeline found normal and healthy condition. The thickness measured at the leaky portion of the pipeline is at permissible levels of 6.1 mm, against the design thickness of 6.35 mm. There was no corrosion or erosion observed in the pipeline and the cause of the leak may be due to an external impact.

During the site visit, CPCL Officials explained that the line was laid at about 1.5 Meters depth in the land area at a distance of 40 meters from the sea. Due to the gradual shifting of the inter-tidal zone and other developments like the Construction of Breakwater at Karaikal Port, and natural calamities such as cyclones etc., the inter-tidal zone has come into contact with the pipeline. However, the exposure of the pipeline to seawater is a recent phenomenon, and hence, corrosion and a reduction in the thickness of the pipeline did not take place.



Figure 3: Photograph of the removed portion of the pipeline with metal clamp

## **8. Studies undertaken by other agencies**

The Hon'ble NGT Principal Bench, New Delhi, in its order dated March 28, 2023, has mentioned that it will be open to the Committee to consider the studies already undertaken and also to take assistance from any other expert/institution. Accordingly, the Committee considered the following studies in this regard.

1. Studies by INCOIS, Hyderabad
2. Joint studies by NCSCM, Chennai, and NCCR, Chennai
3. Studies by the Coast Guard, ICGS Karaikal
4. Studies by the TNPCB
5. Studies by the CPCL

### **8.1. Studies by INCOIS, Hyderabad**

The Indian National Centre for Ocean Information Services (INCOIS), Ministry of Earth Sciences, Govt. of India, Hyderabad, released an advisory report on the Oil spill on March 6, 2023. The gist of the report is furnished below.

INCOIS has generated an oil drift pattern for the period 20.00 hrs March 2, 2023 to 23.00 hrs on March 8, 2023. As per the report, at 23.00 hrs on March 6, 2023 -10.91 KM of coastline will be affected and on the next day, it can affect 11.40 KM. Further, on March 08, 2023 at 23.00 hrs, 12.00 KM of coastline will be affected. The quantity of oil considered in this simulation study was 100 MT as the exact quantity of oil spilled was not known to INCOIS. Hence a disclaimer was provided in the report prepared by INCOIS after the simulation (Please see Annexure: 1). The forecast quality was not confirmed due to uncertainty in the spill conditions. An advisory report published by INCOIS is enclosed as Annexure: 1.

### **8.2. Joint study by NCSCM- Chennai and NCCR- Chennai**

The Department of Environment (DoE), Government of Tamil Nadu, directed the expert committee to inspect the crude oil spill site and submit a report on the impact and assessment of the site.

A team of experts from the National Centre for Sustainable Coastal Management (NCSCM) and National Centre for Coastal Research (NCCR), the sub-collector of Nagapattinam district, the officials of the Department of Environment (DoE) and Climate Change, Tamil Nadu, and the officials of CPCL visited the crude oil spill site at Pattinacherry, Nagore Coast, Nagapattinam, Tamil Nadu, on March 6, 2023. The final report was submitted to the Department of Environment (DoE) and Climate Change, Government of Tamil Nadu, Chennai (Annexure: 2)

The summary of the report is furnished below:

- The amount of crude oil spilled: The CPCL authorities informed that about 1000 liters of crude oil spilled over the area where the pipeline was damaged. It will be used to forecast and estimate the impact of crude oil on the marine ecosystem and its fate along and across the coast.
- Treatment and removal of oil slick: The spill was completely removed from the beach and the spread was controlled by applying the oil spill dispersant.
- Physical and Biological impacts: From intertidal observation along the study area it was observed that the diversity of intertidal organisms remained good and healthy. There is no oil sludge evidence/ marking on the groins and boulders along the intertidal rocky shore. The organisms of the intertidal area consist of burrowing crabs, gastropods, bivalves, and tubicolous polychaetes, etc. The observed Total Petroleum Hydrocarbon (TPH) concentration was slightly higher than the concentrations recommended for designated best use for Class SW-1 (salt pans, shell fishing, mariculture, and ecologically sensitive zones) by the CPCB. However, the reported TPH concentrations are comparable to previous studies along the southeast coast of the Bay of Bengal.

### **8.3. Studies by Coast Guard, ICGS Karaikal**

The requisite points from Coast Guard, ICGS Karaikal, mentioned in the NGT order dated March 28, 2023 in OA 205/2023 of the Hon'ble NGT Principal Bench, New Delhi, are furnished below.

a) On March 03, 2023, 08.30 Hrs

- ❖ Coast assessment was made until 0.8 Nautical Miles from the shoreline and reported no oil spillage along the coast until Nagapattinam.

- ❖ There was minor leakage which was spread in 50-60 Mtrs intertidal area at the scene of the incident
- b) On March 4, 2023, 11.00 Hrs
- ❖ Both Indian Coast Guard Ships (ICGS) C-436 and ICGS C-435 reported 'No oil spill' along the coast of Nagapattinam
  - ❖ Dornier flight- Traces of oil near shore extended up to 2 KM along the coastal line
- c) On March 5, 2023,
- ❖ ICGS C-436 reported 'No oil spill'
- d) On March 6, 2023,
- ❖ No traces of oil seen along the coast

#### **8.4. Report for the Water samples taken by TNPCB**

CPCL and TNPCB officials, Nagapattinam inspected oil spillage on 04<sup>th</sup> and 5<sup>th</sup> March 2023. The surface water samples were collected (at the time of leakage and after arresting the leakage) at three locations along the shore at Pattinachery village in and around the leakage point and sent to Hubert Enviro Care Systems (P) Ltd, NABL accredited laboratory.

Water samples collected on March 04, 2023, very close to the leakage point of the pipeline showed a higher concentration of Total Petroleum Hydrocarbon due to oil accumulation at the spot. Whereas the Total Petroleum Hydrocarbon (TPH) concentrations are within the permissible limits at ~100 Meters away from the spot on both the north and south sampling points. The oil was removed by deploying a mobile vacuum sucker to avoid any possibility of oil ingress into the sea on March 04, 2023.

Similarly, based on the results of seawater samples collected on March 05, 2023, the TPH concentrations are well within the CPCB Permissible limits at all the sampling points. The CPCB Permissible level for Class SW-1 (for harbour waters) is 10 mg/L. A full sample analysis report is enclosed as Annexure: 3.

### 8.5. Studies by CPCL

The Joint Committee instructed CPCL to share the documents/reports carried out in connection with the crude pipeline leak. CPCL submitted the following reports.

- a) Crude pipeline inspection report for the past one year
- b) Thickness measurement of the crude pipeline inspection report
- c) Central Mechanical Engineering Research Institute (CMERI) metallurgical analysis report of a 20” crude pipeline failure of CBR.
- d) Indian Oil Corporation Ltd- Research and Development (IOC-R&D) report on Bioremediation of sand
- e) The Energy and Resources Institute (TERI), New Delhi on Environment Impact Assessment study
- f) Indian Institutes of Technology (IIT), Chennai, for oil spillage drift pattern study & oil spill quantity study

The committee studied the reports and the important observations are furnished below.

#### **a) Crude line inspection report for the past one year (internal audit)**

CPCL shared the walk-through audit report for the crude pipeline. This inspection was carried out during the course of crude oil pumping through the pipeline. As per the CPCL crude pipeline inspection report, there were no abnormalities found in the pipeline (Annexure: 4).

#### **b) Thickness measurement of crude pipelines carried out in 2022**

CPCL carried out ultrasonic thickness gauging of the subject crude pipeline in June 2022 at various locations on both above-ground and underground portions of the pipeline. The external condition of the above-ground portion of the pipeline was found to be good. The thickness of the pipeline is well within the limits and satisfactory (Annexure: 5).

#### **c) CSIR-Central Mechanical Engineering Research Institute, Durgapur (CMERI) metallurgical analysis report of 20” crude pipeline failure of CBR**

CPCL entrusted the Central Mechanical Research Engineering Institute, Durgapur, which is the apex R&D institute for mechanical engineering under the aegis of the Council of Scientific and

Industrial Research (CSIR) to carry out the metallurgical analysis of crude pipeline to identify the root cause of the failure. The CMERI metallurgical analysis report has concluded that the pipeline failed primarily due to external object impact force. The CMERI conclusion is furnished below. The CMERI Report is enclosed as Annexure: 6.

- 1) The crack was initiated only on the outside diameter (OD) pipe wall surface of the pipeline
- 2) The plastic collapse on the pipeline was due to the impact of external or foreign objects
- 3) The plastic deformation-induced deformation texture bands within the metal matrix microstructure are evidenced by electron microscopy and optical microscopy.
- 4) The crack morphology on the failed pipeline was predominantly dominated by a brittle fracture due to sudden impact, while a mixed (brittle and ductile) mode of crack propagation was also evidenced.

**d) IOC R&D report on Bioremediation of sand**

IOC R&D team visited on March 06, 2023, to study the requirements of bioremediation. IOC R&D experts observed the following:

- 1) On the shore near the leak site as well as in the adjacent area, no traces of oil or tarball were observed. It is noteworthy that when crude oil comes in contact with sand, it forms tar balls due to the mixing of oil and sand with sea waves.
- 2) A few black spots were noticed on shore, which was probably due to material like coal dust which was not sticky like crude oil.
- 3) A representative composite sample of sand from the beach was collected from different depths and analyzed for Total Petroleum Hydrocarbon (TPH) content using the USEPA 9071B method. The TPH content of the composite sample was below the detection limit (less than 1 ppm).

IOC R&D Report is enclosed as Annexure: 7.

**e) The Energy and Resources Institute (TERI), New Delhi, on Environment Impact Assessment study**

The Energy and Resources Institute (TERI) has carried out an Environment Impact Assessment study on seawater and sediment quality, Aquatic Biodiversity effect on the aquatic population.

The TERI report concluded based on the overall marine water and sediment quality analysis of the study area that there is no evidence of environmental damage attributed to the oil leak, and their findings are detailed below.

- 1) The overall water quality analysis, sediment and biodiversity analysis of the study area from the crude oil leak point, revealed that there is no evidence of visible environmental damage.
- 2) The sampling and site investigation findings showed that there is no visible contamination in and around the sampling site.

A detailed report is attached as Annexure:8

**f) IIT Chennai for Oil spillage drift pattern study and Oil spill quantity study**

IIT studied the oil spill pattern based on the satellite imagery from the PlanetScope image with 3-meter resolution on the day of the incidents and subsequently.

As per the findings of satellite imagery

- ❖ On March 3, 2023 at 9:39 AM      Oil spots were noticed at the leakage point, and subsequent drifting on the southern side with insignificant oil spill patches has been noticed.
- ❖ On March 4 and 5      Satellite images are not clear due to cloud coverage in that area.
- ❖ On March 6 and 7 at 09.30 Hrs      No oil spill was noticed on March 6 and 7 satellite images.

IIT has also generated oil spill trajectory patterns on a forecast basis using the GNOME model for the spill reported due to pipeline leakage at Nagore Beach to identify the quantum of leakage. The validation has been carried out using satellite image analysis.

IIT also studied oil spillage with Numerical modelling with 10MT with 1000 spots, 20 MT with 2000 spots , 40MT with 4000 spots , 60MT with 6000 spots, 80 MT with 8000 spots and 100MT with 10000 spots. IIT compared the spill pattern with an actual satellite image and concluded that roughly 10 MT would have leaked. CPCL clarified that they have deployed a mobile vacuum sucker and removed 3.4 MT (4000 Litres) and used oil dispersant to disperse 4.25 MT (5000 Litres). Hence, net spillage after vaporization is around 1.04 MT (1227 liters).

IIT Oil spillage drift pattern study (Annexure: 9) and Oil spill quantity study reports are enclosed (Annexure:10).

## **9. Summary and Findings of the Joint Committee**

- a) The oil leak was observed on March 2, 2023, around 18.50 Hrs and a temporary clamp was provided on March 3, 2023, and the leak was arrested on March 4, 2023 early in the morning. On March 06, 2023, the site was again inspected by the TNPCB officials, Nagapattinam, and it was observed that no crude oil leakage was observed and the visual observation of the shoreline was clean. No fish deaths were reported due to the incident. The samples (at the time of leakage and after arresting the leakage) at three locations along the shore at Pattinachery village in and around the leakage point were collected and sent to NABL accredited private laboratory.
- b) Water samples collected on March 04, 2023, very close to the leakage point of the pipeline showed a higher concentration of TPH due to oil accumulation at the spot. The oil was removed by deploying a mobile vacuum sucker to avoid any possibility of oil ingress into the sea on March 04, 2023. Similarly, on March 05, 2023, the TPH concentrations were well within the CPCB Permissible limits in all the sampling points. The CPCB Permissible level for Class SW-1 (for harbour waters) is 10 mg/L.
- c) On March 16, 2023, the District Administration, Nagapattinam, convened a peace committee meeting with the Pattinachery Fishing Village People, Department of Fisheries, TNPCB Officials, and revenue officials and concluded to remove the pipeline laid in the sea.

- d) Based on the TERI, DoE-Tamil Nadu (NCSCM & NCCR) and TNPCB reports confirmed that, there is NO visible environmental damage in and around the spillage area. Also, the reports concluded that the TPH concentrations along the spillage site are within the permissible level.
- e) The quantity of oil leaks was less and has not had an environmental impact. The leak was not due to internal or external corrosion but was due to an external impact.
- f) The portion of the pipeline adjacent to the clamped area was found intact and healthy and the visual inspection of the pipeline found that there was NO internal or external corrosion.
- g) CMERI failure analysis has concluded that the pipeline failed primarily due to external object impact force and the crack was initiated only from the OD pipe wall surface of the pipeline.

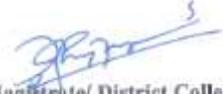
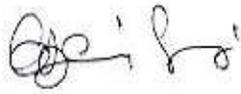
#### **10. Recommendations on remedial measures to be undertaken by CPCL**

During the Site visit, it was found that the ~850 meters pipeline from the seashore was completely dismantled and removed. It was instructed by the committee that Scraps found on this seashore should be removed at the earliest. And also, it was ascertained by the joint committee that the stakeholders of Pattinacherry and Nagore Village are satisfied with the action taken by the District Administration and also M/s Chennai Petroleum Corporation Limited-Cauvery Basin Refinery – CPCL-CBR).

#### **As such, no remedial measures are suggested for the subject crude line**

- a) While laying the new crude line for the proposed gross root Refinery, the line needs to be laid at an adequate depth as per good engineering practices.
- b) The Data Acquisition system (SCADA) and SOP has to be developed for monitoring the pipeline integrity. CPCL should ensure Supervisory Control and Data Acquisition system (SCADA) system for monitoring the pipeline integrity and leak.
- c) Implementing a sound management system to develop and maintain the integrity of pipelines. The proposed crude lines shall have wall thickness higher than the actual requirement as per engineering requirements considering the above factors.

## Signature of the Joint Committee Members

<b>Members of the joint committee</b>	<b>Signature</b>
<b>District Collector &amp; Magistrate,</b> Nagapattinam, Tamil Nadu.	 District Magistrate/ District Collector,
<b>Dr. Sudheer Joseph,</b> Scientist- G and Division Head, Applied Research and Research to Operations (ARO), INCOIS, Hyderabad.	
<b>Er. Poornima BM,</b> Scientist D, Central Pollution Control Board (CPCB), Regional Directorate – Chennai, Tamil Nadu	 <b>Scientist D, CPCB</b>
<b>Er. V. Thamiloli,</b> District Environmental Engineer, Tamil Nadu Pollution Control Board (TNPCB), Nagapattinam.	 <b>Er. V. Thamilóli,</b> District Environmental Engineer,
<b>Dr. G. Hariharan,</b> Scientist- C, Coastal Environmental Impact Assessment (CIA) Divisions, National Centre for Sustainable Coastal Management, Chennai.	 Scientist- C- NCSCM