

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
(SOUTHERN ZONE) CHENNAI.**

**O.A.No.19 of 2013,
O.A.No.248 of 2016 and
O.A.No.224 of 2016**

Meenavargal Mempattu Sangam

..Applicant

-Vs-

The Chief Secretary,
Government of Tamil Nadu,
Chennai and others

..Respondents

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Dated at Chennai on this the 17th day of July, 2021.

Certified that all the above are true copies of their respective originals.


COUNSEL FOR RESPONDENT

CPCB Joint Committee inspection observation (May 2016) – Compliance

S.No	Recommendation of Joint Inspection	Compliance Status
i	All the industries are required to install flow meters to maintain proper records of water consumption, effluent generation from different section of process along with material balance and water balance and same to be made available to TNPCB/CPCB during inspection.	LAB plant, HCD Plant and ECH Plant <ul style="list-style-type: none"> Flow meter provided at the outlet of ETP and monitoring data connected to TNPCB/CPCB. Flow meter installed at the inlet of ETP and monitoring data will be connected to TNPCB/CPCB by September 2021. Records are being maintained for water consumption and generation. Water Balance and Materials Balance are periodically submitted to TNPCB. Flow meters photos attached as ANNEXURE 4A, 4B, 4C.
ii	Existing ETPs of MPL-I and II and TPL found inadequate, hence it is suggested to take up treatability study to identify the suitable treatment technology to meet the prescribed standards of marine disposal system.	Complied. LAB plant, HCD Plant and ECH Plant; Existing Effluent Treatment Plants are adequate to treat the effluents generated from TPL Plants and Effluent Treatment Plants are being operated efficiently and effectively. The quality of treated effluent is meeting the standards at all times. The Results of Analysis (ROA) of TNPCB for the past two years reveals that all the parameters are well within the prescribed standards. ROA are attached as ANNEXURE – 5A, 5B, 5C Online Effluent monitoring system is provided to monitor the quality of treated effluents and monitoring data connected to CAC, TNPCB.
iii	All four industries have to prepare planned schedule of pumping of treated effluent into marine disposal system and to ensure the quality of effluent meeting the standards before discharging into sea.	Complied. Schedule prepared and being followed. ANNEXURE - 6
iv	All industries have to install water level indicators in raw effluent collection tank as well as treated effluent storage tanks to assess the quantity of effluent received, treated, recycled and discharged into marine disposal system. They have to maintain proper	Complied LAB plant, HCD Plant, ECH Plant: <ul style="list-style-type: none"> Water level indicators were installed at raw effluent collection tank as well as treated effluent tanks and records being maintained. Online Flow meter was installed at the

	records/logbook for effluent generated, treated and quantity of treated effluent discharged into marine disposal system on daily basis.	outlet of ETPs and monitoring data connected to TNPCB. • Level Indicator photo attached as ANNEXURE – 7A, 7B, 7C
v	All industries to install at least three intermediate flow meters in the marine disposal pipeline where provisions are made to collect samples to assess the quantity of effluent pumped and discharged. This will also help in finding of any leaks in the pipelines. These flow meters shall connect to TNPCB/CPCB monitoring centre.	Three flow meters were installed in the marine disposal pipeline and connectivity will be provided by Sep 21. <i>July</i>
vi	All sapling points are found accessible to public and this issue needs to be locked into; these sampling locations have to be provided with lock and key arrangement and one set of key as well as valve operating devices shall be given to TNPCB to access at any point of time.	Lock and key provided and one set given to TNPCB.
vii	M/s. MPL I and II have to install online BOD, COD analyser in the marine disposal pipeline and to be connected to TNPCB/CPCB	Scope of MPL Plant
viii	The industry shall provide advanced leak detection system along with manual verification for quick identification of leak in the marine disposal pipeline for immediate repair of the same to prevent the soil and ground water contamination in the surrounding area.	Scope of MPL Plant
ix	The detailed marine study shall be taken up considering the actual quality and quantity of effluent discharged into sea to assess to dilution factor to verify the impact on marine species by an expert agency.	Marine impact study will be carried out once in a year through accredited consultant and cost of the project will be shared by all three industries.
x	The floaters have to be installed to identify the actual point of location or diffusers inside the sea. Without any proper identification it is very difficult to locate exact point of diffuser for collection of samples from disposal points otherwise the samples collected may not be true representative of actual	Scope of MPL Plant

	Pollution load.	
xi	All industries are required to conduct toxicity studies for their effluents and also for combined discharge of effluents. The result shall be submitted to TNPCB including species used for the study assess the actual situation.	Complied Toxicity Study was conducted for the treated effluents and report submitted to TNPCB. Copy of the report is attached as ANNEXURE - 8

NGT – Joint Committee Report – Compliance status

Recommendation of Joint Committee Report submitted on October 28, 2020		
S.No.	Recommendation	Compliance status
1	M/s Kothari Petrochemicals Ltd. shall be directed to remit the interim compensation of Rs. 24 Lakhs for non-compliance.	Not Applicable
	2. Short Term:	
a.	At present, M/s KPL is discharging the RO reject into the Marine, in order to reduce the quantum of marine discharge as well as for use of raw water, possibilities shall be explored by M/s MPL or M/s TPL for utilizing RO reject generated from M/s. KPL in their process. (Target: One Month)	TPL has taken sample from KPL sea discharge point. The results of the analysis reveal the chlorides, TDS, Conductivity, Silica in the effluent are high. Also Ammoniacal nitrogen and Sulphate are higher in KPL effluent. The effluent with above characteristics is not suitable for Propylene Oxide process. This will affect the process, plant operation, equipment's and product specification.
b.	If the RO Reject found suitable for utilization, then the discharge of M/s KPL shall be stopped and sent to M/s MPL or M/s TPL. (Target: Two Month)	Not Applicable
c.	Action plan on phase wise revamping of treatment units of the ETP in M/s MPL Unit I and M/s TPL (all three plants HCD, LAB & ECH – PO) shall be submitted, since physical damages found during the visit. Action plan shall be submitted within a month. (Target: Two Year)	LAB Plant Following ETP components were revamped and completed during Feb 2021. <ul style="list-style-type: none"> - API Oil Separator - Secondary Neutraliser. - Clarifier (AM 1907) - Primary Neutralising Pit - ETP area – floor Levelling and painted. ECH – PO Plant <ul style="list-style-type: none"> - Secondary Clarifier was revamped and completed on Feb 2021. Photos attached - Rotary Drum Vacuum Filter – Rectification Job will be completed by Sep 2021. - ETP area – Painted. HCD Plant <ul style="list-style-type: none"> - ETP – Neutralising Tanks - Inner

		Walls will be plastered and completed by March 2022. Revamp Photos attached as ANNEXURE - 9
d.	<p>Since M/s TPL is reusing the treated effluent generated from HCD & LAB plant in the ECH – PO plant, online flow meters shall be installed at HCD & LAB plant to quantify the utilization of treated effluent.</p> <p>Moreover, the online effluent monitoring system installed for the parameters pH, TSS, COD, BOD etc. at HCD/LAB plant shall be relocated to the common discharge pipeline after confluence of all treated effluent and installation of display board showing effluent quality to the general public. (Target: Three Months)</p>	<p>Online flow meters are provided at the following locations and monitoring data has been connected to TNPCB/CPCB.</p> <ul style="list-style-type: none"> • LAB - ETP outlet • HCD - ETP outlet, and • ECH-PO – ETP Outlet. <p>Online effluent monitoring system installed is provided at LAB, HCD & ECH plant and connected to TNPCB/CPCB. Electronic display board is installed at the entrance of LAB, HCD and ECH plants and display is showing effluent quality to general public.</p> <p>Effluent monitoring system installed at LAB & HCD plant shall be relocated to the common discharge pipeline as per the TNPCB/CPCB advice.</p> <p>Photograph attached as Annexure – 4A, 4B, 4C.</p>
e.	<p>In order to assess the sea water quality, Continuous Marine Water Quality Monitoring system shall be installed at discharge point for the parameters Temperature, Conductivity, Salinity, Turbidity and Total Dissolved Solids (TDS), Dissolved Oxygen (DO), pH, Chlorophyll, fluorescent Dissolved Organic Matter (fDOM) and phycoerythrin-a pigment of blue-green algae etc. The recorded data shall be shared to NIOT & TNPCB for assessing the marine quality. (Target: Six Month)</p>	<p>MPL will initiate the action plan and cost of the Continuous Marine Water Quality Monitoring system will be borne by MPL, TPL and KPL.</p> <p>Joint commitment letter is attached ANNEXURE - 10</p>
f.	<p>MPL plant I & II and M/s TPL: A pilot scale study shall be carried out with DISC membrane or any other suitable technology for reducing the discharge of treated effluent in to the sea. Possibilities shall also be explored for achieving complete or partial ZLD. Action plan shall be submitted within a month. (Target: One Year)</p>	<p>MPL has carried out Disc membrane study and also took up study by CECRI for ZLD. The project cost was not viable as the cost of treated water is Rs 3000 – 4000/ KL.</p> <p>Since the effluent contains high calcium chloride, the technology is not suitable for treatment. Moreover, the TDS contents of RO reject was very high. The project and recurring cost is</p>

		<p>very high and not economically viable. The effluent quality is same as MPL effluent since process and product is same.</p> <p>TPL has enquired and one of the consultant informed that the cost of pilot plant will be high and not economically viable.</p> <p>However TPL shall also explore the other suitable technology to process the treated effluent for reuse.</p>
g.	Calibration of the flow meters installed in the discharge pipeline shall be carried out periodically and ensure no difference in each of the flow meters.	Flow meters are being calibrated periodically to ensure no difference in flow meters and records are being maintained.
	3. Long Term:	
1.	<p>NIOT has suggested long term study in both the report (2015 & 2020) to assess the marine water quality and flora & fauna marine life as well as indicated the pollution from other sources also.</p> <p>So, it is suggested to have a comprehensive impact assessment study to assess the quality of water and biological impacts in the receiving waters which shall cover larger extents (spatial) along the coast and two seasons (pre monsoon / post monsoon). The study area shall cover Ennore Creek, North Chennai Coastal waters from Pulicat to Muthukadu in the South to cover pollution signals during all seasons as there is northerly drift for 8 months and southerly drift for 4 months in a year. Therefore, representative samples shall be analysed to map the variation in space and time.</p> <p>In order to have a detail study, it is suggested to carry out continuous study for a period of five years (twice in a year), in which the impact & sources of pollution shall be identified. Accordingly, remedial measures shall be suggested.</p> <p>TNPCB shall provide list of marine outfall units & other source of pollution including source point data of industrial outfalls (including Ennore creek) and others such as municipal discharges, data from</p>	<p>Marine impact study at the point where the treated trade effluent is being discharged into sea will be carried out once in year through accredited consultants and cost of the project will be shared by all three industries (M/s. MPL, M/s. TPL & M/s. KPL).</p> <p>Joint commitment letter is attached Annexure - 10</p>

<p>Kamarajar port, Chennai port, Fishing harbour etc. TNPCB shall utilise the Environmental Compensation fund for this study and same may be recovered after the polluter identification. The studies can be conducted by national institutes such as NIOT or any other reputed institutes.</p> <p>NIOT has observed the marine life quality improvement, after dredging activity carried out during Ennore Port development. Therefore, possible means to improve the marine water / life quality shall be suggested based on data.</p>	
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LAB Plant - ETP Photos



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Effluent Treatment Plant



RO Plant

LAB - ETP Components



Low Rate Bio Filter



Clarifier



Tilted Plate separator



Polishing Tank



Primary & Secondary Neutraliser



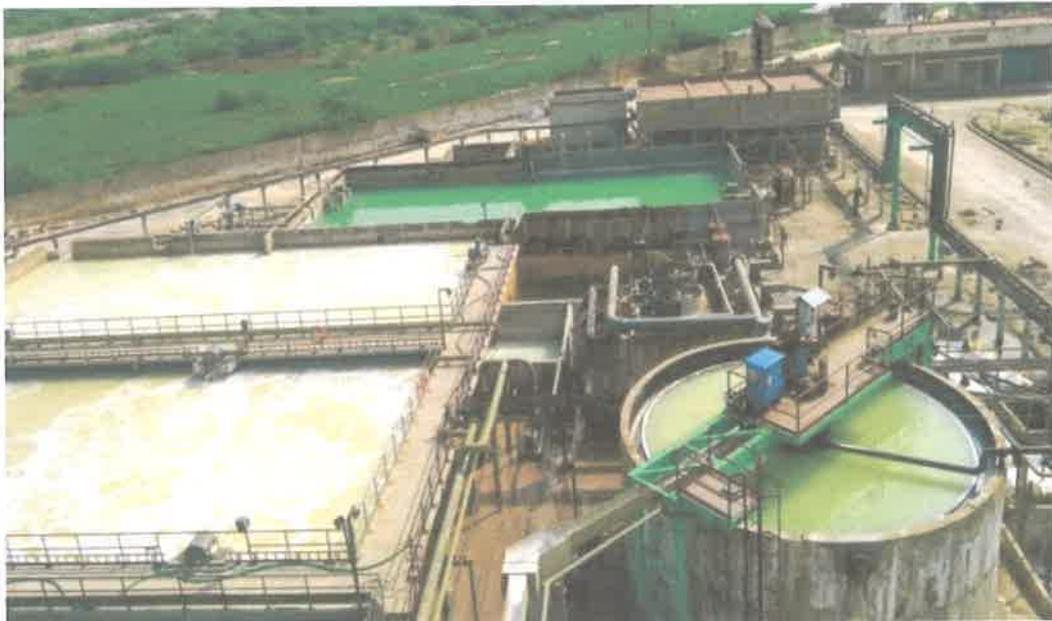
API Separator

HCD Plant – ETP and its Components



Acid / Alkali Effluent Compartment

ECH – PO Plant – ETP and its Components



HRT, Bio Reactor, Neutralising Pit



Bio Reactors, TET



Secondary Clarifier



Cooling Tower



Filter Press

M/s. TPL - HED

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TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No.9 /2016-17

Dated : 30.05.2016

Name of the Sender : DEE/Ambattur
 Nature and Number of sample : One number of sample
 Date and Time of Collection : 27.04.2016 at 11.05 AM
 Date and Time of Receipt : 27.04.2016 at 4.00 PM
 Code No. & Point of Collection : 1. 9008 - ETP outlet - T

Sl.No.	Parameters	Unit	1
1.	pH	Number	7.01
2.	Total Suspended Solids	mg/L	28
3.	Total Dissolved Solids	mg/L	26392
4.	Chlorides	mg/L	13996
5.	Sulphates	mg/L	140
6.	Oils & Grease	mg/L	5.2
7.	BOD for 3 days at 27 ^o C	mg/L	2
8.	Chemical Oxygen Demand	mg/L	**
9.	Phosphate	mg/L	3.6
10.	Zinc	mg/L	0.5
11.	TRC	mg/L	<1
12.	Cyanide	mg/L	<0.001
13.	Total Chromium	mg/L	<0.01
14.	Hexavalent Chromium	mg/L	<0.01
15.	Phenolic Compounds	mg/L	<0.01
16.	Fluoride	mg/L	<0.05
17.	Calcium	mg/L	28
18.	Sulphide	mg/L	5
19.	Copper	mg/L	<0.002
20.	Nickel	mg/L	<0.01
21.	Cadmium	mg/L	<0.01
22.	Lead	mg/L	<0.02

** Note: Parameters could not be ascertained due to interferences during analysis

[Signature]
Deputy CSO (L)
DEL, Manali

M/S. TPC - HCD

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TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY – MANALI

REPORT OF ANALYSIS

ROA No. 28/2016-17

Dated : 15.07.2016

Name of the Sender : DEE/Ambattur
 Nature and Number of sample : One number of sample
 Date and Time of Collection : 27.05.2016 at 11.25 AM
 Date and Time of Receipt : 27.05.2016 at 5.00 PM
 Code No. & Point of Collection : 1. 9073 – ETP outlet - T

Sl.No.	Parameters	Unit	1
1.	pH	Number	7.28
2.	Total Suspended Solids	mg/L	10
3.	Total Dissolved Solids	mg/L	29124
4.	Chlorides	mg/L	15695
5.	Sulphates	mg/L	630
6.	Oils & Grease	mg/L	5.6
7.	BOD for 3 days at 27 ^o C	mg/L	2
8.	Chemical Oxygen Demand	mg/L	**
9.	Phosphate	mg/L	0.4
10.	Zinc	mg/L	0.5
11.	TRC	mg/L	<1
13.	Cyanide	mg/L	<0.001
14.	Total Chromium	mg/L	<0.003
15.	Hexavalent Chromium	mg/L	<0.01
16.	Phenolic Compounds	mg/L	<0.01
17.	Fluoride	mg/L	<0.05
18.	Calcium	mg/L	80
19.	Sulphide	mg/L	<1
20.	Copper	mg/L	0.01
21.	Nickel	mg/L	<0.01
22.	Cadmium	mg/L	<0.01
23.	Lead	mg/L	<0.02

** Note: Parameters could not be ascertained due to interferences during analysis

[Signature]
 Deputy CSO (L)
 DEL, Manali

LAB Plant - Electronic Boards located at Entrance



HCD - Plant - Electronic Boards located at Entrance



**LAB Plant
Flow meter – Inlet to ETP**



Inlet to ETP from OPWS Pit



Inlet to ETP from Cooling Tower



Inlet to ETP from Neutralising Pit

Flow meter – ETP Outlet



Flow Meter - ETP Outlet

HCD Plant
Flow meter – Inlet to ETP



Inlet to ETP from WTP



Inlet to ETP from Process

Flow meter – ETP Outlet



Flow Meter - ETP Outlet

ECH - PO Plant

Flow meter – Inlet to ETP



Inlet to ETP from WTP



Inlet to ETP from Process

Flow meter – ETP Outlet



Flow Meter - ETP Outlet

M/S. TPL-LAB 20



TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

Jan 2019

ROA No. 124 / 2018-19

Dated : 21.02.2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 09.01.2019 at 04.15 PM

Code No. & Point of Collection : 1. VRS-14/01 - ETP Outlet - T

Sl.No	Parameters	Unit	l
1.	pH	Number	8.04
2.	Total Suspended Solids	mg/L	16
3.	Total Dissolved Solids	mg/L	804
4.	Chlorides	mg/L	415
5.	Sulphates	mg/L	64
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	10
8.	Chemical Oxygen Demand	mg/L	80
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.61
13.	TRC	mg/L	<1
14.	Calcium	mg/L	40
15.	Total Chromium	mg/L	<0.003
16.	Hexavalent Chromium	mg/L	<0.01
17.	Zinc	mg/L	0.1538

for *Janika Kovand*
Deputy CSO (L) 11/3/19
DEL, Manali

01/03/19



M/s. TPL - LAB 21

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

Feb 2019

ROA No. 138 / 2018-19

Dated : 28.02.2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt s : 06.02.2019 at 11.45 AM
Code No. & Point of Collection : 1. VRS-46/02 - ETP Outlet - T

Sl.No	Parameters	Unit	I
1.	pH	Number	8.31
2.	Total Suspended Solids	mg/L	14
3.	Total Dissolved Solids	mg/L	1062
4.	Chlorides	mg/L	500
5.	Sulphates	mg/L	81
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	6
8.	Chemical Oxygen Demand	mg/L	40
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.43
13.	TRC	mg/L	<1
14.	Calcium	mg/L	67
15.	Total Chromium	mg/L	<0.003
16.	Hexavalent Chromium	mg/L	<0.01
17.	Zinc	mg/L	0.0849

for Kamitha Desai
Deputy CSO (L)
DEL, Manali 5/3/19

06/03/19

M/S TPL - LAB ²²



TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

Feb 2019

ROA No. 155 / 2018-19

Dated : 30.04.2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt s : 27.02.2019 at 01.10 PM
Code No. & Point of Collection : 1. VRS-71/02 - ETP Outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.19
2.	Total Suspended Solids	mg/L	82
3.	Total Dissolved Solids	mg/L	11234
4.	Chlorides	mg/L	6498
5.	Sulphates	mg/L	262
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ⁰ C	mg/L	2
8.	Chemical Oxygen Demand	mg/L	8
9.	Phosphate	mg/L	0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.63
13.	TRC	mg/L	<1
14.	Calcium	mg/L	1122
15.	Total Chromium	mg/L	<0.003
16.	Hexavalent Chromium	mg/L	<0.01
17.	Zinc	mg/L	0.1129

[Signature]
Deputy CSO (L)
DEL, Manali *3/4/19*

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M/S. TPL - LAB



TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

March 2019

ROA No. 168 / 2018-19

Dated : 03.05.2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 13.03.2019 at 03.00 PM
Code No. & Point of Collection : 1. VRS-07/03 - ETP Outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.01
2.	Total Suspended Solids	mg/L	12
3.	Total Dissolved Solids	mg/L	940
4.	Chlorides	mg/L	435
5.	Sulphates	mg/L	118
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	4
8.	Chemical Oxygen Demand	mg/L	32
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.31
13.	TRC	mg/L	<1
14.	Calcium	mg/L	48
15.	Total Chromium	mg/L	<0.003
16.	Hexavalent Chromium	mg/L	<0.01
17.	Zinc	mg/L	0.1072

Deputy CSO (L)
DEL, Manali



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M/S- TPL-LAB

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY – MANALI

REPORT OF ANALYSIS

ROA No. 11 / 2019-20

Dated : 24.06.2019

May 2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 16.05.2019 at 11.00 AM

Code No. & Point of Collection : 1. VRS-35/05 - ETP Outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.70
2.	Total Suspended Solids	mg/L	12
3.	Total Dissolved Solids	mg/L	972
4.	Chlorides	mg/L	411
5.	Sulphates	mg/L	100
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	7
8.	Chemical Oxygen Demand	mg/L	48
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.35
13.	TRC	mg/L	<1
14.	Calcium	mg/L	67
15.	Total Chromium	mg/L	<0.003
16.	Hexavalent Chromium	mg/L	<0.01
17.	Zinc	mg/L	0.1206

Deputy CSO (L)
DEL, Manali
29/6/19



TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY – MANALI

REPORT OF ANALYSIS

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M/s. TPL - LAB
June 2019

ROA No. 26 / 2019-20

Dated : 25.07.2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 28.06.2019 at 03.00 PM

Code No. & Point of Collection : 1. VRS-26/06 - ETP Outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.43
2.	Total Suspended Solids	mg/L	52
3.	Total Dissolved Solids	mg/L	10018
4.	Chlorides	mg/L	5890
5.	Sulphates	mg/L	144
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	6
8.	Chemical Oxygen Demand	mg/L	48
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.76
13.	TRC	mg/L	4
14.	Calcium	mg/L	144
15.	Total Chromium	mg/L	<0.003
16.	Hexavalent Chromium	mg/L	<0.01
17.	Zinc	mg/L	0.1462

Deputy CSO (L)
DEL, Manali

M/s TPL - LAB

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July 2019

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 33 / 2019-20

Dated : 06.08.2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 19.07.2019 at 01.00 PM

Code No. & Point of Collection : 1. SR-18/07 - ETP Outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.85
2.	Total Suspended Solids	mg/L	8
3.	Total Dissolved Solids	mg/L	996
4.	Chlorides	mg/L	424
5.	Sulphates	mg/L	165
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ⁰ C	mg/L	4
8.	Chemical Oxygen Demand	mg/L	24
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.36
13.	TRC	mg/L	<1
14.	Calcium	mg/L	142
15.	Total Chromium	mg/L	<0.003
16.	Hexavalent Chromium	mg/L	<0.01
17.	Zinc	mg/L	0.1014

Deputy CSO (L)
DEL, Manali

M/S TPL-LAB 27



AUGUST 2019

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 47 / 2019-20

Dated : 13.09.2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 21.08.2019 at 03.00 PM
Code No. & Point of Collection : 1. SR-08/14 - ETP Outlet - T

Sl.No	Parameters	Unit	I
1.	pH	Number	7.69
2.	Total Suspended Solids	mg/L	14
3.	Total Dissolved Solids	mg/L	774
4.	Chlorides	mg/L	311
5.	Sulphates	mg/L	139
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ⁰ C	mg/L	10
8.	Chemical Oxygen Demand	mg/L	96
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.43
13.	TRC	mg/L	<1
14.	Calcium	mg/L	148
15.	Total Chromium	mg/l.	<0.003
16.	Hexavalent Chromium	mg/L	<0.01
17.	Zinc	mg/L	0.0106

Kanisha Leonard
Deputy CSO (L) 20/9/19
DEL, Manali

M/S. TPL-LAB

28



OCT 2019

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 64 / 2019-20

Dated : 21.11.2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipts : 11.10.2019 at 11.00 AM

Code No. & Point of Collection : 1. SR-10/04 - ETP Outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	6.82
2.	Total Suspended Solids	mg/L	14
3.	Total Dissolved Solids	mg/L	782
4.	Chlorides	mg/L	299
5.	Sulphates	mg/L	166
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	4
8.	Chemical Oxygen Demand	mg/L	24
9.	Phosphate	mg/L	0.18
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	<1
13.	TRC	mg/L	<1
14.	Calcium	mg/L	125
15.	Total Chromium	mg/L	<0.003
16.	Hexavalent Chromium	mg/L	<0.01
17.	Zinc	mg/L	0.0112

Done
21/11/19
CSO (L)
DEL, Manali



Handwritten: TPL-LAB 29

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

Nov 2019

ROA No. 75 / 2019 - 20

Dated : 26.01.2020

Name of the Sender

: DEE/Ambattur

Nature and Number of sample

: One number of sample

Date and Time of Receipt

: 29.11.2019 at 04.15 PM

Code No. & Point of Collection

: 1. SR-51/11 - ETP Outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.10
2.	Total Suspended Solids	mg/L	10
3.	Total Dissolved Solids	mg/L	662
4.	Chlorides	mg/L	318
5.	Sulphates	mg/L	69
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ⁰ C	mg/L	6
8.	Chemical Oxygen Demand	mg/L	40
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	<1
13.	TRC	mg/L	<1
14.	Calcium	mg/L	140
15.	Total Chromium	mg/L	<0.003
16.	Hexavalent Chromium	mg/L	<0.01
17.	Zinc	mg/L	0.0102

Handwritten signature and date: 26/1/2020
CSO (L)
DEL, Manali

M/S. TPL-LAB 30



TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

DEC 2019

ROA No. 86 / 2019-20

Dated : 28.01.2020

Name of the Sender

: DEE/Ambattur

Nature and Number of sample

: One number of sample

Date and Time of Receipt

: 27.12.2019 at 03.30 PM

Code No. & Point of Collection

: 1. SR-30/12 - ETP Outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.24
2.	Total Suspended Solids	mg/L	10
3.	Total Dissolved Solids	mg/L	712
4.	Chlorides	mg/L	377
5.	Sulphates	mg/L	42
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ⁰ C	mg/L	6
8.	Chemical Oxygen Demand	mg/L	40
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	<1
13.	TRC	mg/L	<1
14.	Calcium	mg/L	62
15.	Total Chromium	mg/L	<0.003
16.	Hexavalent Chromium	mg/L	<0.01
17.	Zinc	mg/L	<0.0015

[Signature]
28/1/2020
CSO (L)
DEL, Manali



H/S TPL-LAB 31

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY – MANALI

REPORT OF ANALYSIS

ROA No. 96 / 2019-20

Dated : 09.03.2020

JAN 2020

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 31.01.2020 at 05.30 PM
Code No. & Point of Collection : 1. SR-41/01 - ETP Outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.02
2.	Total Suspended Solids	mg/L	10
3.	Total Dissolved Solids	mg/L	838
4.	Chlorides	mg/L	440
5.	Sulphates	mg/L	20
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	8
8.	Chemical Oxygen Demand	mg/L	16
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	<1
13.	TRC	mg/L	<1
14.	Calcium	mg/L	27
15.	Total Chromium	mg/L	<0.003
16.	Hexavalent Chromium	mg/L	<0.01
17.	Zinc	mg/L	0.1013

CSO (L)
DEL, Manali
9/3/2020

7/13 TPL - LAB 32



Feb 2020

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 97 / 2019-20

Dated : 17.03.2020

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 06.02.2020 at 04:30 PM
Code No. & Point of Collection : 1. SR-24/02 - ETP Outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.50
2.	Total Suspended Solids	mg/L	42
3.	Total Dissolved Solids	mg/L	578
4.	Chlorides	mg/L	196
5.	Sulphates	mg/L	141
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ⁰ C	mg/L	18
8.	Chemical Oxygen Demand	mg/L	72
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	<1
13.	TRC	mg/L	<1
14.	Calcium	mg/L	42
15.	Total Chromium	mg/L	<0.003
16.	Hexavalent Chromium	mg/L	<0.01
17.	Zinc	mg/L	0.1123

CSO (L)
DEL, Manali
17/3/2020



M/S. TPL - LAB 33

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

MAY 2020

REPORT OF ANALYSIS

ROA No. 03 / 2020-21

Dated : 11.09.2020

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 27.05.2020 at 05.20 PM

Code No. & Point of Collection : 1. SR-19/05 - ETP Outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.62
2.	Total Suspended Solids	mg/L	10
3.	Total Dissolved Solids	mg/L	814
4.	Chlorides	mg/L	320
5.	Sulphates	mg/L	103
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	6
8.	Chemical Oxygen Demand	mg/L	*
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.30
13.	TRC	mg/L	<1
14.	Calcium	mg/L	114
15.	Total Chromium	mg/L	<0.003
16.	Hexavalent Chromium	mg/L	<0.01
17.	Zinc	mg/L	IF

* -- COD not performed
IF -- Instrument failure (AAS)

Done
11/9/2020
CSO (L)
DEL, Manali



M/S. TPL - LABS

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TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

JUNE 2020

REPORT OF ANALYSIS

ROA No. 06 / 2020-21

Dated : 11.09.2020

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 17.06.2020 at 01.30 AM
Code No. & Point of Collection : 1. SR-33/06 - ETP Outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.31
2.	Total Suspended Solids	mg/L	12
3.	Total Dissolved Solids	mg/L	766
4.	Chlorides	mg/L	260
5.	Sulphates	mg/L	141
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	7
8.	Chemical Oxygen Demand	mg/L	*
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	<1
13.	TRC	mg/L	<1
14.	Calcium	mg/L	74
15.	Total Chromium	mg/L	<0.003
16.	Hexavalent Chromium	mg/L	<0.01
17.	Zinc	mg/L	IF

* -- COD not performed
IF - Instrument failure (AAS)

Done
11/9/2020
CSO (L)
DEL, Manali



M/S. TPL - LAB 35

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

JULY
2020

REPORT OF ANALYSIS

ROA No. 14 / 2020-21

Dated : 11.09.2020

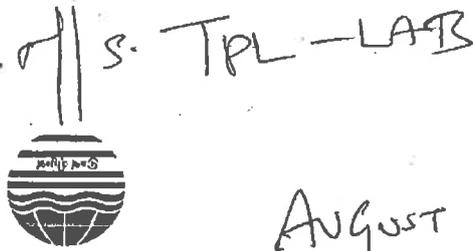
Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 28.07.2020 at 05.55 PM
Code No. & Point of Collection : 1. SR-44/07 - ETP Outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.95
2.	Total Suspended Solids	mg/L	10
3.	Total Dissolved Solids	mg/L	512
4.	Chlorides	mg/L	193
5.	Sulphates	mg/L	95
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	4
8.	Chemical Oxygen Demand	mg/L	*
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	<1
13.	TRC	mg/L	<1
14.	Calcium	mg/L	108
15.	Total Chromium	mg/L	<0.003
16.	Hexavalent Chromium	mg/L	<0.01
17.	Zinc	mg/L	IF

* -- COD not performed
IF - Instrument failure (AAS)

11/9/2020

CSO (L)
DEL, Manali



Handwritten: AUGUST 2020

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 18 / 2020-21

Dated : 11.09.2020

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 28.08.2020 at 04.15 PM
Code No. & Point of Collection : 1. SR-18/08 - ETP Outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.06
2.	Total Suspended Solids	mg/L	6
3.	Total Dissolved Solids	mg/L	974
4.	Chlorides	mg/L	410
5.	Sulphates	mg/L	104
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	3
8.	Chemical Oxygen Demand	mg/L	*
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	<1
13.	TRC	mg/L	<1
14.	Calcium	mg/L	140
15.	Total Chromium	mg/L	<0.003
16.	Hexavalent Chromium	mg/L	<0.01
17.	Zinc	mg/L	IF

* -- COD not performed

IF - Instrument failure (AAS)

Handwritten: 11/9/2020
Signature
CSO (L)
DEL, Manali
Handwritten: 11/9/2020



M/S TPL-LAB 37

SEP 2020

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 29 / 2020-21

Dated : 08.10.2020

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 18.09.2020 at 05.30 PM

Code No. & Point of Collection : 1. SR-23/09 - ETP Outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	8.61
2.	Total Suspended Solids	mg/L	6
3.	Total Dissolved Solids	mg/L	844
4.	Chlorides	mg/L	370
5.	Sulphates	mg/L	73
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	3
8.	Chemical Oxygen Demand	mg/L	*
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.47
13.	TRC	mg/L	<1
14.	Calcium	mg/L	124
15.	Total Chromium	mg/L	<0.003
16.	Hexavalent Chromium	mg/L	<0.01
17.	Zinc	mg/L	0.1431

* -- COD not performed

CSO (L)
DEL, Manali

8/10/2020

7/11/20 TPL-LAB

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OCT 2020

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 41 / 2020-21

Dated : 07.11.2020

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 16.10.2020 at 05.20 PM

Code No. & Point of Collection : 1. SR-41/10 - ETP Outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.95
2.	Total Suspended Solids	mg/l.	6
3.	Total Dissolved Solids	mg/l.	860
4.	Chlorides	mg/L.	340
5.	Sulphates	mg/l.	85
6.	Oils & Grease	mg/l.	<1
7.	BOD for 3 days at 27 ^o C	mg/L.	3
8.	Chemical Oxygen Demand	mg/L.	16
9.	Phosphate	mg/l.	<0.15
10.	Cyanide	mg/l.	<0.005
11.	Phenolic Compounds	mg/l.	<0.005
12.	Fluoride	mg/l.	<1
13.	TRC	mg/l.	<1
14.	Calcium	mg/l.	136
15.	Total Chromium	mg/l.	<0.003
16.	Hexavalent Chromium	mg/L.	<0.01
17.	Zinc	mg/l.	0.1016

[Signature]
7/11/2020

CSO (L.)
DEE, Manali

[Signature]
7/11/2020



TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 52 / 2020-21

Dated : 08.12.2020

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 20.11.2020 at 01.15 PM

Code No. & Point of Collection : 1. SR-31/11 - ETP Outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.56
2.	Total Suspended Solids	mg/L	6
3.	Total Dissolved Solids	mg/L	658
4.	Chlorides	mg/L	340
5.	Sulphates	mg/L	39
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	3
8.	Chemical Oxygen Demand	mg/L	8
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.38
13.	TRC	mg/L	<1
14.	Calcium	mg/L	136
15.	Total Chromium	mg/L	<0.003
16.	Hexavalent Chromium	mg/L	<0.01
17.	Zinc	mg/L	<0.0015

CSO (L)
DEL, Manali
8/12/2020



7/5 TPL-LAB 40

DEC 2020

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 76 / 2020-21

Dated : 09.02.2021

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 31.12.2020 at 04.00 PM

Code No. & Point of Collection : 1. SR-78/12 - ETP Outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	6.17
2.	Total Suspended Solids	mg/L	10
3.	Total Dissolved Solids	mg/L	778
4.	Chlorides	mg/L	340
5.	Sulphates	mg/L	99
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	7
8.	Chemical Oxygen Demand	mg/L	40
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.78
13.	TRC	mg/L	2
14.	Calcium	mg/L	84
15.	Total Chromium	mg/L	<0.003
16.	Hexavalent Chromium	mg/L	<0.01
17.	Zinc	mg/L	<0.0015

Kanitha Leonard
for CSO (L) 9/2/21
DEL, Manali



T/S. TPL-LAB 41

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY – MANALI

REPORT OF ANALYSIS

JAN 2021

ROA No. 79 / 2020-21

Dated : 15.02.2021

Name of the Sender : DEE/Ambattur
Nature and Number of sample : Three number of samples
Date and Time of Receipt : 22.01.2021 at 11.20 AM
Code No. & Point of Collection : 1. SR-32/01 – ETP outlet - T
2. SR-41/01 – RO permeate - T
3. SR-42/01 – RO reject – Partially Treated

Sl.No	Parameters	Unit	1	2	3
1.	pH	Number	7.88	7.62	5.76
2.	Total Suspended Solids	mg/L	10	6	48
3.	Total Dissolved Solids	mg/L	862	380	4830
4.	Chlorides	mg/L	290	225	2249
5.	Sulphates	mg/L	97	4	392
6.	BOD for 3 days at 27 ^o C	mg/L	6	2	22
7.	Chemical Oxygen Demand	mg/L	48	8	216
8.	Phosphate	mg/L	<0.15	<0.15	<0.15
9.	Cyanide	mg/L	<0.005	<0.005	<0.005
10.	Phenolic Compounds	mg/L	<0.005	<0.005	<0.005
11.	Fluoride	mg/L	<1	<1	<1
12.	TRC	mg/L	<1	<1	14
13.	Calcium	mg/L	85	12	168
14.	Total Chromium	mg/L	<0.003	<0.003	<0.003
15.	Hexavalent Chromium	mg/L	<0.01	<0.01	<0.01
16.	Zinc	mg/L	0.2107	0.1016	0.5902

for *Santha Leonard*
CSO (L) 16/2/21
DEL, Manali



TPL - LAB

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TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

FEB 2021

ROA No. 90 / 2020-21

Dated :27.04.2021

Name of the Sender : DEE/Ambattur
Nature and Number of sample : Three number of samples
Date and Time of Receipt : 19.02.2021 at 4.45 PM
Code No. & Point of Collection : 1. SR-52/02 - ETP outlet - T
2. SR-53/02 - RO Reject - T
3. SR-54/02 - RO permeate - Partially-T

Sl.No	Parameters	Unit	1	2	3
1.	pH	Number	8.23	7.67	7.42
2.	Total Suspended Solids	mg/L	16	86	4
3.	Total Dissolved Solids	mg/L	1514	4154	342
4.	Chlorides	mg/L	860	2349	175
5.	Sulphates	mg/L	34	149	9
6.	BOD for 3 days at 27 ^o C	mg/L	6	32	2
7.	Chemical Oxygen Demand	mg/L	40	288	8
8.	Phosphate	mg/L	<0.15	<0.15	<0.15
9.	Cyanide	mg/L	<0.005	<0.005	<0.005
10.	Phenolic Compounds	mg/L	<0.005	<0.005	<0.005
11.	Flouride	mg/L	<1	<1	<1
12.	TRC	mg/L	<1	42	<1
13.	Calcium	mg/L	100	16	6
14.	Total Chromium	mg/L	<0.003	<0.003	<0.003
15.	Hexavalent Chromium	mg/L	<0.01	<0.01	<0.01
16.	Zinc	mg/L	0.1916	0.4802	0.1008

for Kanitha Leonard
CSO (L) 27/4/21
DEL, Manali

M/S TPL - HCD

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TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 124 / 2018-19

Dated : 26.02.2019

Jan 2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 09.01.2019 at 04.15 PM

Code No. & Point of Collection : 1. VRS-17/01 - ETP Outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.32
2.	Total Suspended Solids	mg/L	14
3.	Total Dissolved Solids	mg/L	9472
4.	Chlorides	mg/L	5498
5.	Sulphates	mg/L	235
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	3
8.	Chemical Oxygen Demand	mg/L	48
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.82
13.	TRC	mg/L	40
14.	Sulphide	mg/L	<1
15.	Calcium	mg/L	92
16.	Total Chromium	mg/L	<0.003
17.	Hexavalent Chromium	mg/L	<0.01
18.	Copper	mg/L	0.3460
19.	Zinc	mg/L	0.4480
20.	Lead	mg/L	0.2126
21.	Cadmium	mg/L	0.0192
22.	Nickel	mg/L	0.1266

for Karthikeyan
Deputy CSO (L) 11/3/19
DEL, Manali

01/03/19



TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY – MANALI

REPORT OF ANALYSIS

44
M/S. TPL - HCO
Feb 2019

ROA No. 138/2018 – 19

Dated : 22.03.2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 06.02.2019 at 11.45 AM

Code No. & Point of Collection : 1. VRS - 40/02 – ETP outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.99
2.	Total Suspended Solids	mg/L	64
3.	Total Dissolved Solids	mg/L	14974
4.	Chlorides	mg/L	7997
5.	Sulphates	mg/L	924
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	10
8.	Chemical Oxygen Demand	mg/L	64
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	1.21
13.	TRC	mg/L	25
14.	Sulphide	mg/L	<1
15.	Calcium	mg/L	200
16.	Total Chromium	mg/L	<0.003
17.	Hexavalent Chromium	mg/L	<0.01
18.	Copper	mg/L	<0.0015
19.	Zinc	mg/L	0.3843
20.	Lead	mg/L	0.0132
21.	Cadmium	mg/L	0.0239
22.	Nickel	mg/L	0.3739

Deputy CSO (L)
DEL, Manali
25/3/19



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M/s TPL - HCD

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

Feb 20 19

ROA No. 155/2018 - 19

Dated : 30.04.2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 27.02.2019 at 01.10 PM
Code No. & Point of Collection : 1. VRS - 74/02 - ETP outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.31
2.	Total Suspended Solids	mg/L	26
3.	Total Dissolved Solids	mg/L	18932
4.	Chlorides	mg/L	10997
5.	Sulphates	mg/L	415
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	2
8.	Chemical Oxygen Demand	mg/L	8
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.70
13.	TRC	mg/L	<1
14.	Sulphide	mg/L	<1
15.	Calcium	mg/L	48
16.	Total Chromium	mg/L	<0.003
17.	Hexavalent Chromium	mg/L	<0.01
18.	Copper	mg/L	0.2483
19.	Zinc	mg/L	0.3189
20.	Lead	mg/L	0.0084
21.	Cadmium	mg/L	<0.008
22.	Nickel	mg/L	0.1658

Deputy CSO (L)
DEL, Manali
3/4/19



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M/s. TPL - HCD

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

March 2019

ROA No. 168/2018-19

Dated : 03.05.2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 13.03.2019 at 03.00 PM

Code No. & Point of Collection : 1. VRS - 10/03 - ETP outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	8.72
2.	Total Suspended Solids	mg/L	14
3.	Total Dissolved Solids	mg/L	10122
4.	Chlorides	mg/L	7598
5.	Sulphates	mg/L	5
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	4
8.	Chemical Oxygen Demand	mg/L	32
9.	Phosphate	mg/L	0.24
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.56
13.	TRC	mg/L	<1
14.	Sulphide	mg/L	<1
15.	Calcium	mg/L	3
16.	Total Chromium	mg/L	<0.003
17.	Hexavalent Chromium	mg/L	<0.01
18.	Copper	mg/L	0.0227
19.	Zinc	mg/L	0.2140
20.	Lead	mg/L	0.1679
21.	Cadmium	mg/L	<0.008
22.	Nickel	mg/L	0.0457

Deputy CSO (L)
DEL, Manali

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M/s. TPL - HCD



TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 11 / 2019-20

Dated : 24.06.2019

May 2018

Name of the Sender

: DEE/Ambattur

Nature and Number of sample

: One number of sample

Date and Time of Receipt

: 16.05.2019 at 11.00 AM

Code No. & Point of Collection

: 1. VRS-38/05 - ETP Outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.48
2.	Total Suspended Solids	mg/L	60
3.	Total Dissolved Solids	mg/L	10926
4.	Chlorides	mg/L	6360
5.	Sulphates	mg/L	18
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	4
8.	Chemical Oxygen Demand	mg/L	24
9.	Phosphate	mg/L	0.41
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.36
13.	TRC	mg/L	<1
14.	Sulphide	mg/L	<1
15.	Calcium	mg/L	16
16.	Total Chromium	mg/L	<0.003
17.	Hexavalent Chromium	mg/L	<0.01
18.	Copper	mg/L	0.1202
19.	Zinc	mg/L	0.4542
20.	Lead	mg/L	0.0337
21.	Cadmium	mg/L	<0.008
22.	Nickel	mg/L	0.2833

L. S. S. S.
Deputy CSO (L)
DEL, Manali
24/6/19



M/s. TPL - HCD

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TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

June 2019

ROA No. 26/2019-20

Dated : 25.07.2019

Name of the Sender

: DEE/Ambattur

Nature and Number of sample

: One number of sample

Date and Time of Receipt

: 28.06.2019 at 03.00 PM

Code No. & Point of Collection

: 1. VRS - 29/06 - ETP outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.65
2.	Total Suspended Solids	mg/L	48
3.	Total Dissolved Solids	mg/L	7002
4.	Chlorides	mg/L	4180
5.	Sulphates	mg/L	2
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	4
8.	Chemical Oxygen Demand	mg/L	16
9.	Phosphate	mg/L	0.48
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.30
13.	TRC	mg/L	<1
14.	Sulphide	mg/L	<1
15.	Calcium	mg/L	2
16.	Total Chromium	mg/L	<0.003
17.	Hexavalent Chromium	mg/L	<0.01
18.	Copper	mg/L	0.0905
19.	Zinc	mg/L	0.4916
20.	Lead	mg/L	<0.015
21.	Cadmium	mg/L	<0.008
22.	Nickel	mg/L	<0.006

Deputy CSO (L)
DEL, Manali

M/s. TPL - HCD 49



TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

July 2019

ROA No. 33/2019-20

Dated : 06.08.2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 19.07.2019 at 01.00 PM

Code No. & Point of Collection : 1. SR - 21/07 - ETP outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.34
2.	Total Suspended Solids	mg/L	52
3.	Total Dissolved Solids	mg/L	9562
4.	Chlorides	mg/L	5400
5.	Sulphates	mg/L	344
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	7
8.	Chemical Oxygen Demand	mg/L	48
9.	Phosphate	mg/L	0.23
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.72
13.	TRC	mg/L	42
14.	Sulphide	mg/L	<1
15.	Calcium	mg/L	104
16.	Total Chromium	mg/L	<0.003
17.	Hexavalent Chromium	mg/L	<0.01
18.	Copper	mg/L	0.1016
19.	Zinc	mg/L	0.4792
20.	Lead	mg/L	<0.015
21.	Cadmium	mg/L	<0.008
22.	Nickel	mg/L	<0.006

Deputy CSO (L)
DEL, Manali

50
M/S TPL-HCO



AUGUST 2019

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 47/2019-20

Dated : 13.09.2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 21.08.2019 at 03.00 PM

Code No. & Point of Collection : 1. SR - 08/17 - ETP outlet - T

Sl.No	Parameters	Unit	I
1.	pH	Number	8.28
2.	Total Suspended Solids	mg/L	48
3.	Total Dissolved Solids	mg/L	10692
4.	Chlorides	mg/l.	6129
5.	Sulphates	mg/L	282
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ⁰ C	mg/L	13
8.	Chemical Oxygen Demand	mg/L	120
9.	Phosphate	mg/L	0.27
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/l.	0.82
13.	TRC	mg/l.	17
14.	Sulphide	mg/l.	<1
15.	Calcium	mg/L	200
16.	Total Chromium	mg/l.	<0.003
17.	Hexavalent Chromium	mg/l.	<0.01
18.	Copper	mg/l.	0.2513
19.	Zinc	mg/L	0.5001
20.	Lead	mg/L	0.1883
21.	Cadmium	mg/L	0.0292
22.	Nickel	mg/l.	0.2124

Sanjha Leonard
Deputy CSO (L.)
DEL. Manali 20/9/19



M/S. TPL - HCD

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TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

OCT 2019

ROA No. 64/2019-20

Dated : 21.11.2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 11.10.2019 at 11.00 AM

Code No. & Point of Collection : 1. SR - 10/07 - ETP outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.61
2.	Total Suspended Solids	mg/L	22
3.	Total Dissolved Solids	mg/L	7326
4.	Chlorides	mg/L	4243
5.	Sulphates	mg/L	172
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	5
8.	Chemical Oxygen Demand	mg/L	40
9.	Phosphate	mg/L	0.37
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.68
13.	TRC	mg/L	8
14.	Sulphide	mg/L	<1
15.	Calcium	mg/L	144
16.	Total Chromium	mg/L	<0.003
17.	Hexavalent Chromium	mg/L	<0.01
18.	Copper	mg/L	0.1073
19.	Zinc	mg/L	0.4181
20.	Lead	mg/L	0.0058
21.	Cadmium	mg/L	<0.008
22.	Nickel	mg/L	0.1266

Dee
21/11/19
CSO (L)
DEL, Manali



M/s. TPL-HED

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TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 75 / 2019-20

Dated : 26.01.2020

NOV 2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 29.11.2019 at 04.15 PM

Code No. & Point of Collection : 1. SR-54/11 - ETP outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.39
2.	Total Suspended Solids	mg/L	92
3.	Total Dissolved Solids	mg/L	7832
4.	Chlorides	mg/L	4055
5.	Sulphates	mg/L	665
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ⁰ C	mg/L	7
8.	Chemical Oxygen Demand	mg/L	48
9.	Phosphate	mg/L	0.18
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.63
13.	TRC	mg/L	32
14.	Sulphide	mg/L	<1
15.	Calcium	mg/L	248
16.	Total Chromium	mg/L	<0.003
17.	Hexavalent Chromium	mg/L	<0.01
18.	Copper	mg/L	0.0946
19.	Zinc	mg/L	0.3702
20.	Lead	mg/L	0.2388
21.	Cadmium	mg/L	0.0150
22.	Nickel	mg/L	0.2138

CSO (L) 26/1/2020
DEL, Manali



TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY – MANALI

REPORT OF ANALYSIS

53
M/s. TPL - HCD
DEC 2019

ROA No. 86 / 2019-20

Dated : 28.01.2020

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 27.12.2019 at 03.30 PM
Code No. & Point of Collection : 1. SR-33/12 - ETP outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.09
2.	Total Suspended Solids	mg/L	38
3.	Total Dissolved Solids	mg/L	6234
4.	Chlorides	mg/L	3347
5.	Sulphates	mg/L	297
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ⁰ C	mg/L	7
8.	Chemical Oxygen Demand	mg/L	80
9.	Phosphate	mg/L	0.72
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.54
13.	TRC	mg/L	<1
14.	Sulphide	mg/L	<1
15.	Calcium	mg/L	40
16.	Total Chromium	mg/L	<0.003
17.	Hexavalent Chromium	mg/L	<0.01
18.	Copper	mg/L	0.4101
19.	Zinc	mg/L	0.4049
20.	Lead	mg/L	0.3571
21.	Cadmium	mg/L	<0.008
22.	Nickel	mg/L	0.3541

[Signature]
CSO (L)
DEL, Manali
28/1/2020



TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 96 / 2019-20

Dated : 09.03.2020

54
M/s. TPL - HED
JAN 2020

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 31.01.2020 at 05.30 PM
Code No. & Point of Collection : 1. SR - 44/01 - ETP outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.89
2.	Total Suspended Solids	mg/L	28
3.	Total Dissolved Solids	mg/L	9034
4.	Chlorides	mg/L	4941
5.	Sulphates	mg/L	407
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	9
8.	Chemical Oxygen Demand	mg/L	112
9.	Phosphate	mg/L	0.24
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.92
13.	TRC	mg/L	<1
14.	Sulphide	mg/L	<1
15.	Calcium	mg/L	108
16.	Total Chromium	mg/L	<0.003
17.	Hexavalent Chromium	mg/L	<0.01
18.	Copper	mg/L	<0.0015
19.	Zinc	mg/L	0.3396
20.	Lead	mg/L	<0.015
21.	Cadmium	mg/L	<0.008
22.	Nickel	mg/L	<0.006

CSO (L)
DEL, Manali
9/3/2020

XXVI/198/4^o
6^o



7/5 TPL-HCD



TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

RCV No 97 2019 20

Dated : 17.03.2020

Feb 2020

Name of the Sender
Nature and Number of sample
Date and Time of Receipt

DEI/Ambattur
One number of sample
06.02.2020 at 04.30 PM

Case No. & Point of Collection

1. SR - 27/02 - ETP outlet

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Sl.No	Parameters	Unit	Value
1.	pH	Number	8.34
2.	Total Suspended Solids	mg/L	28
3.	Total Dissolved Solids	mg/L	25784
4.	Chlorides	mg/L	14970
5.	Sulphates	mg/L	697
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	10
8.	Chemical Oxygen Demand	mg/L	112
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	<1
13.	TTC	mg/L	34
14.	Sulphide	mg/L	<1
15.	Calcium	mg/L	60
16.	Total Chromium	mg/L	<0.003
17.	Hexavalent Chromium	mg/L	<0.01
18.	Copper	mg/L	<0.0015
19.	Zinc	mg/L	0.4016
20.	Lead	mg/L	0.0650
21.	Cadmium	mg/L	0.0393
22.	Nickel	mg/L	0.5583

[Signature]
CSO (I)
DEL, Manali
17/3/2020



H/S. TPL - HCD 5b

MAY 2020

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 03 / 2020-21

Dated : 11.09.2020

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 27.05.2020 at 05.20 PM
Code No. & Point of Collection : 1. SR - 22/05 - ETP outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.47
2.	Total Suspended Solids	mg/L	30
3.	Total Dissolved Solids	mg/L	1186
4.	Chlorides	mg/L	510
5.	Sulphates	mg/L	175
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	18
8.	Chemical Oxygen Demand	mg/L	*
9.	Phosphate	mg/L	0.19
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.54
13.	TRC	mg/L	<1
14.	Sulphide	mg/L	<1
15.	Calcium	mg/L	160
16.	Total Chromium	mg/L	<0.003
17.	Hexavalent Chromium	mg/L	<0.01
18.	Copper	mg/L	IF
19.	Zinc	mg/L	
20.	Lead	mg/L	
21.	Cadmium	mg/L	
22.	Nickel	mg/L	

* -- COD not performed
IF - Instrument failure (AAS)

CSO (L)
11/9/2020
DEL, Manali



H/S. TPL - HCD 57

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

JUNE 2020

ROA No. 06 / 2020-21

Dated : 11.09.2020

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 17.06.2020 at 01.30 AM
Code No. & Point of Collection : 1. SR - 37/06 - ETP outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.87
2.	Total Suspended Solids	mg/L	38
3.	Total Dissolved Solids	mg/L	6414
4.	Chlorides	mg/L	3649
5.	Sulphates	mg/L	157
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ⁰ C	mg/L	16
8.	Chemical Oxygen Demand	mg/L	*
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.71
13.	TRC	mg/L	2
14.	Sulphide	mg/L	4
15.	Calcium	mg/L	168
16.	Total Chromium	mg/L	<0.003
17.	Hexavalent Chromium	mg/L	<0.01
18.	Copper	mg/L	IF
19.	Zinc	mg/L	
20.	Lead	mg/L	
21.	Cadmium	mg/L	
22.	Nickel	mg/L	

* -- COD not performed
IF - Instrument failure (AAS)

Deel
11/9/2020
CSO (L)
DEL, Manali



7/5. TPL - Head 58

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

July 2020

ROA No. 14 / 2020-21

Dated : 11.09.2020

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 28.07.2020 at 05.55 PM
Code No. & Point of Collection : 1. SR - 47/07 - ETP outlet - T

Sl.No	Parameters	Unit	1
1.	pH	Number	8.32
2.	Total Suspended Solids	mg/L	36
3.	Total Dissolved Solids	mg/L	9462
4.	Chlorides	mg/L	5400
5.	Sulphates	mg/L	257
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ⁰ C	mg/L	2
8.	Chemical Oxygen Demand	mg/L	*
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.91
13.	TRC	mg/L	5
14.	Sulphide	mg/L	<1
15.	Calcium	mg/L	281
16.	Total Chromium	mg/L	<0.003
17.	Hexavalent Chromium	mg/L	<0.01
18.	Copper	mg/L	IF
19.	Zinc	mg/L	
20.	Lead	mg/L	
21.	Cadmium	mg/L	
22.	Nickel	mg/L	

* -- COD not performed
IF -- Instrument failure (AAS)

CSO (L)
DEL, Manali
11/2/2020



7/3 TPL - HCD 59

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 52 / 2020-21

Dated : 08.12.2020

Nov 2020

Name of the Sender : DEE/Ambattur
Nature and Number of sample : Four number of samples
Date and Time of Receipt : 20.11.2020 at 01.15 PM

Code No. & Point of Collection

1. SR-35/11 - ETP outlet - T 2. SR-36/11 - TB-1 NA 3. SR-37/11 - TB-2 NA
4. SR-38/11 - TB - 3 NA

Sl. No.	Parameters	Unit	1	2	3	4
1.	pH	Number	8.56	7.54	7.73	7.92
2.	Total Suspended Solids	mg/L	14	12	10	18
3.	Total Dissolved Solids	mg/L	7298	3564	3426	3968
4.	Chlorides	mg/L	4249	1999	1860	2299
5.	Sulphates	mg/L	51	99	92	46
6.	Oils & Grease	mg/L	<1	<1	<1	<1
7.	BOD for 3 days at 27 ^o C	mg/L	7	6	5	10
8.	Chemical Oxygen Demand	mg/L	40	32	24	72
9.	Phosphate	mg/L	<0.15	<0.15	<0.15	<0.15
10.	Cyanide	mg/L	<0.005	<0.005	<0.005	<0.005
11.	Phenolic Compounds	mg/L	<0.005	<0.005	<0.005	<0.005
12.	Flouride	mg/L	<1	--	--	--
13.	TRC	mg/L	<1	<1	<1	13
14.	Sulphide	mg/L	<1	<1	<1	<1
15.	Calcium	mg/L	120	--	--	--
16.	Ammonical Nitrogen	mg/L	--	<5	<5	<5
17.	Total Chromium	mg/L	<0.003	<0.003	<0.003	<0.003
18.	Hexavalent Chromium	mg/L	<0.01	<0.01	<0.01	<0.01
19.	Copper	mg/L	<0.0015	<0.0015	<0.0015	<0.0015
20.	Zinc	mg/L	0.4133	0.4997	0.4710	0.4210
21.	Lead	mg/L	0.1847	0.0643	0.0510	0.0760
22.	Cadmium	mg/L	0.0193	<0.008	<0.008	<0.008
23.	Nickel	mg/L	0.4254	0.4030	0.3102	0.3179
24.	Total Iron	mg/L	--	0.24	0.22	0.18
25.	Mercury	mg/L	--	*	*	*

* -- Mercury Not analysed

AN
8/12/2020

CSO (L)
DEL, Manali

8/12/2020



Ms. TPL - HED 60

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 76 / 2020-21

Dated : 08.02.2021

DEC 2020

Name of the Sender : DEE/Ambattur
Nature and Number of sample : Three number of samples
Date and Time of Receipt : 31.12.2020 at 04.00 PM

Code No. & Point of Collection

1. SR-81/12 - ETP outlet - T 2. SR-82/12 - TB-1 NA 3. SR-83/12 - TB-2 NA

Sl. No.	Parameters	Unit	1	2	3
1.	pH	Number	7.16	7.76	7.14
2.	Total Suspended Solids	mg/L	38	32	86
3.	Total Dissolved Solids	mg/L	10942	8732	23374
4.	Chlorides	mg/L	5998	4998	12996
5.	Sulphates	mg/L	274	113	195
6.	Oils & Grease	mg/L	<1	<1	<1
7.	BOD for 3 days at 27 ^o C	mg/L	6	4	8
8.	Chemical Oxygen Demand	mg/L	32	16	48
9.	Phosphate	mg/L	<0.15	<0.15	<0.15
10.	Cyanide	mg/L	<0.005	<0.005	<0.005
11.	Phenolic Compounds	mg/L	<0.005	<0.005	<0.005
12.	Flouride	mg/L	0.74	--	--
13.	TRC	mg/L	<1	<1	<1
14.	Sulphide	mg/L	<1	<1	<1
15.	Calcium	mg/L	34	--	--
16.	Ammonical Nitrogen	mg/L	--	8	<5
17.	Total Chromium	mg/L	<0.003	<0.003	<0.003
18.	Hexavalent Chromium	mg/L	<0.01	<0.01	<0.01
19.	Copper	mg/L	0.1417	<0.0015	<0.0015
20.	Zinc	mg/L	0.9318	0.3715	0.8318
21.	Lead	mg/L	0.1417	0.1012	0.0963
22.	Cadmium	mg/L	0.0146	<0.008	0.0485
23.	Nickel	mg/L	0.2535	0.0702	0.6310
24.	Total Iron	mg/L	--	0.19	1.74
25.	Mercury	mg/L	--	*	*

* -- Mercury Not analysed

for Kanika Leonard
CSO (L) 9/2/21
DEL, Manali



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T/S TPL-HCD

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

JAN 2021

ROA No. 79 / 2020-21

Dated : 15.02.2021

Name of the Sender : DEE/Ambattur
Nature and Number of sample : Four number of samples
Date and Time of Receipt : 22.01.2021 at 11.20 AM

Code No. & Point of Collection

1. SR-35/01 - ETP outlet - T 2. SR-36/01 - TB-1 NA 3. SR-37/01 - TB-2 NA
4. SR-38/01 - TB - 3 NA

Sl. No.	Parameters	Unit	1	2	3	4
1.	pH	Number	7.97	7.92	7.86	7.94
2.	Total Suspended Solids	mg/L	36	22	64	66
3.	Total Dissolved Solids	mg/L	14676	9080	24546	12402
4.	Chlorides	mg/L	8197	5448	13996	6898
5.	Sulphates	mg/L	62	23	28	100
6.	BOD for 3 days at 27 ^o C.	mg/L	14	12	8	11
7.	Chemical Oxygen Demand	mg/L	80	144	72	104
8.	Phosphate	mg/L	<0.15	<0.15	<0.15	<0.15
9.	Cyanide	mg/L	<0.005	<0.005	<0.005	<0.005
10.	Phenolic Compounds	mg/L	<0.005	<0.005	<0.005	<0.005
11.	Flouride	mg/L	0.69	--	--	--
12.	TRC	mg/L	<1	<1	<1	<1
13.	Sulphide	mg/L	<1	<1	<1	<1
14.	Calcium	mg/L	120	--	--	--
15.	Ammonical Nitrogen	mg/L	--	<5	<5	<5
16.	Total Chromium	mg/L	<0.003	<0.003	<0.003	<0.003
17.	Hexavalent Chromium	mg/L	<0.01	<0.01	<0.01	<0.01
18.	Copper	mg/L	0.1126	<0.0015	<0.0015	<0.0015
19.	Zinc	mg/L	0.8608	0.3316	0.6212	0.3214
20.	Lead	mg/L	0.1017	0.1002	0.0768	0.0210
21.	Cadmium	mg/L	0.0112	<0.008	0.0512	0.0146
22.	Nickel	mg/L	0.2102	<0.006	0.6617	0.0761
23.	Total Iron	mg/L	--	<0.005	0.56	0.42
24.	Mercury	mg/L	--	*	*	*

* -- Mercury Not analysed

for Kantha Leonard
CSO (L) 16/2/21
DEL, Manali



TPL-HCD

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TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 90 / 2020-21

Dated :27.04.2021

Name of the Sender : DEE/Ambattur
Nature and Number of sample : Four number of samples
Date and Time of Receipt : 19.02.2021 at 4.45 PM
Code No. & Point of Collection : 1. SR-57/02 - ETP outlet - T
2. SR-58/02 - TB-1 NA
3. SR-59/02 - TB-2 NA
4. SR-60/02 - TB-3 NA

FEB 2021

Sl.No	Parameters	Unit	1	2	3	4
1.	pH	Number	8.52	8.50	8.56	8.63
2.	Total Suspended Solids	mg/L	32	12	16	20
3.	Total Dissolved Solids	mg/L	7438	3010	4252	4402
4.	Chlorides	mg/L	4199	1749	2474	2599
5.	Sulphates	mg/L	186	52	50	56
6.	BOD for 3 days at 27 ^o C	mg/L	14	5	10	12
7.	Chemical Oxygen Demand	mg/L	152	40	112	120
8.	Phosphate	mg/L	<0.15	<0.15	<0.15	<0.15
9.	Cyanide	mg/L	<0.005	<0.005	<0.005	<0.005
10.	Phenolic Compounds	mg/L	<0.005	<0.005	<0.005	<0.005
11.	Flouride	mg/L	0.67	--	--	--
12.	TRC	mg/L	<1	<1	<1	<1
13.	Sulphide	mg/L	<1	<1	<1	<1
14.	Calcium	mg/L	55	--	--	--
15.	Ammonical Nitrogen	mg/L	--	<5	<5	<5
16.	Total Chromium	mg/L	<0.003	<0.003	<0.003	<0.003
17.	Hexavalent Chromium	mg/L	<0.01	<0.01	<0.01	<0.01
18.	Copper	mg/L	0.1012	<0.0015	<0.0015	<0.0015
19.	Zinc	mg/L	0.4916	0.2104	0.4168	0.3012
20.	Lead	mg/L	0.1034	0.1018	0.0413	0.0170
21.	Cadmium	mg/L	0.0142	<0.008	0.0302	0.0112
22.	Nickel	mg/L	0.1940	<0.006	0.5132	0.0341
23.	Total Iron	mg/L	--	1.2	0.26	1.68
24.	Mercury	mg/L	--	*	*	*

* Not Analyzed

for Karitha Leonard
CSO (L) 27/4/21
DEL, Manali



TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

Jan 2019

ROA No. 124 / 2018-19

Dated : 21.02.2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : Two number of samples
Date and Time of Receipt : 09.01.2019 at 04.15 PM

Code No. & Point of Collection : 1. VRS-15/01 - ETP outlet to Sea - T
2. VRS-16/01 - STP Outlet - T

Sl.No	Parameters	Unit	1	2
1.	pH	Number	7.31	8.23
2.	Total Suspended Solids	mg/L	64	14
3.	Total Dissolved Solids	mg/L	13402	902
4.	Chlorides	mg/L	8048	-
5.	Sulphates	mg/L	56	-
6.	Oils & Grease	mg/L	<1	-
7.	BOD for 3 days at 27 ⁰ C	mg/L	12	9
8.	Chemical Oxygen Demand	mg/L	160	80
9.	Phosphate	mg/L	<0.15	-
10.	Cyanide	mg/L	<0.005	-
11.	Phenolic Compounds	mg/L	<0.005	-
12.	Fluoride	mg/L	0.69	-
13.	TRC	mg/L	31	-
14.	Calcium	mg/L	48	-
15.	Total Chromium	mg/L	<0.003	-
16.	Hexavalent Chromium	mg/L	<0.01	-
17.	Copper	mg/L	0.2347	-
18.	Zinc	mg/L	0.2882	-
19.	Lead	mg/L	0.1234	-
20.	Cadmium	mg/L	0.0088	-
21.	Nickel	mg/L	0.2165	-

for *Mani*
Deputy CSO (L) 11/3/19
DEL, Manali

Mani
01/03/19

M/s TPL - ECH
64



TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

Feb 2019

ROA No. 155 / 2018-19

Dated : 30.04.2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : Two number of samples
Date and Time of Receipt : 27.02.2019 at 01.10 PM

Code No. & Point of Collection : 1. VRS-72/02 - ETP outlet to sea - T
2. VRS-73/02 - Outlet from STP - T

Sl.No	Parameters	Unit	1	2
1.	pH	Number	7.85	7.87
2.	Total Suspended Solids	mg/L	12	10
3.	Total Dissolved Solids	mg/L	1018	-
4.	Chlorides	mg/L	470	-
5.	Sulphates	mg/L	91	-
6.	Oils & Grease	mg/L	<1	-
7.	BOD for 3 days at 27 ^o C	mg/L	10	12
8.	Chemical Oxygen Demand	mg/L	80	-
9.	Phosphate	mg/L	0.25	-
10.	Cyanide	mg/L	<0.005	-
11.	Phenolic Compounds	mg/L	<0.005	-
12.	Fluoride	mg/L	0.54	-
13.	TRC	mg/L	<1	-
14.	Calcium	mg/L	42	-
15.	Total Chromium	mg/L	<0.003	-
16.	Hexavalent Chromium	mg/L	<0.01	-
17.	Copper	mg/L	0.1123	-
18.	Zinc	mg/L	0.3679	-
19.	Lead	mg/L	0.1456	-
20.	Cadmium	mg/L	0.0067	-
21.	Nickel	mg/L	0.1224	-

Deputy CSO (L)
DEL, Manali
3/5/19

M/S TPL - ECH 65



TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

March 2019

ROA No. 168 / 2018-19

Dated : 03.05.2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : Two number of samples
Date and Time of Receipt : 13.03.2019 at 03.00 PM

Code No. & Point of Collection : 1. VRS-08/03 - ETP outlet to sea - T
2. VRS-09/03 - Outlet from STP - T

Sl.No	Parameters	Unit	1	2
1.	pH	Number	7.45	8.02
2.	Total Suspended Solids	mg/L	18	12
3.	Total Dissolved Solids	mg/L	8380	-
4.	Chlorides	mg/L	5705	-
5.	Sulphates	mg/L	104	-
6.	Oils & Grease	mg/L	<1	-
7.	BOD for 3 days at 27 ^o C	mg/L	12	6
8.	Chemical Oxygen Demand	mg/L	104	-
9.	Phosphate	mg/L	0.16	-
10.	Cyanide	mg/L	<0.005	-
11.	Phenolic Compounds	mg/L	<0.005	-
12.	Fluoride	mg/L	0.83	-
13.	TRC	mg/L	<1	-
14.	Calcium	mg/L	59	-
15.	Total Chromium	mg/L	<0.003	-
16.	Hexavalent Chromium	mg/L	<0.01	-
17.	Copper	mg/L	0.0302	-
18.	Zinc	mg/L	0.2245	-
19.	Lead	mg/L	0.1614	-
20.	Cadmium	mg/L	<0.008	-
21.	Nickel	mg/L	0.1236	-

Deputy CSO (L)
DEL, Manali

M/S. TPL - ECH

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TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

May 2019

ROA No. 11 / 2019-20

Dated : 24.06.2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : Two number of samples
Date and Time of Receipt : 16.05.2019 at 11.00 AM

Code No. & Point of Collection : 1. VRS-36/05 - ETP outlet to sea - T
2. VRS-37/05 - Outlet from STP - T

Sl.No	Parameters	Unit	1	2
1.	pH	Number	7.88	7.63
2.	Total Suspended Solids	mg/L	22	14
3.	Total Dissolved Solids	mg/L	1164	-
4.	Chlorides	mg/L	421	-
5.	Sulphates	mg/L	157	-
6.	Oils & Grease	mg/L	<1	-
7.	BOD for 3 days at 27 ^o C	mg/L	2	12
8.	Chemical Oxygen Demand	mg/L	8	-
9.	Phosphate	mg/L	0.25	-
10.	Cyanide	mg/L	<0.005	-
11.	Phenolic Compounds	mg/L	<0.005	-
12.	Fluoride	mg/L	0.49	-
13.	TRC	mg/L	<1	-
14.	Calcium	mg/L	75	-
15.	Total Chromium	mg/L	<0.003	-
16.	Hexavalent Chromium	mg/L	<0.01	-
17.	Copper	mg/L	0.1066	-
18.	Zinc	mg/L	0.5129	-
19.	Lead	mg/L	0.1218	-
20.	Cadmium	mg/L	<0.008	-
21.	Nickel	mg/L	<0.006	-

Deputy CSO (L)
DEL, Manali
24/6/19

M/S. TPL. ECH

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TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

June 2019

ROA No. 26 / 2019-20

Dated : 25.07.2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : Two number of samples
Date and Time of Receipt : 28.06.2019 at 03.00 PM
Code No. & Point of Collection : 1. VRS-27/06 - ETP outlet to sea - T
2. VRS-28/06 - Outlet from STP - T

Sl.No	Parameters	Unit	1	2
1.	pH	Number	7.84	7.69
2.	Total Suspended Solids	mg/L	10	22
3.	Total Dissolved Solids	mg/L	612	-
4.	Chlorides	mg/L	256	-
5.	Sulphates	mg/L	82	-
6.	Oils & Grease	mg/L	<1	-
7.	BOD for 3 days at 27 ^o C	mg/L	2	3
8.	Chemical Oxygen Demand	mg/L	8	-
9.	Phosphate	mg/L	0.25	-
10.	Cyanide	mg/L	<0.005	-
11.	Phenolic Compounds	mg/L	<0.005	-
12.	Fluoride	mg/L	0.85	-
13.	TRC	mg/L	<1	-
14.	Calcium	mg/L	64	-
15.	Total Chromium	mg/L	<0.003	-
16.	Hexavalent Chromium	mg/L	<0.01	-
17.	Copper	mg/L	<0.0015	-
18.	Zinc	mg/L	0.5205	-
19.	Lead	mg/L	<0.015	-
20.	Cadmium	mg/L	<0.008	-
21.	Nickel	mg/L	<0.006	-

Deputy CSO (L)
DEL, Manali

M/S. TPL - ECH

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July 2019

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 33 / 2019-20

Dated : 09.08.2019

Name of the Sender

: DEE/Ambattur

Nature and Number of sample

: Two number of samples

Date and Time of Receipt

: 19.07.2019 at 01.00 PM

Code No. & Point of Collection

: 1. SR-19/07 - ETP outlet to sea - T
2. SR-20/07 - Outlet from STP - T

Sl.No	Parameters	Unit	1	2
1.	pH	Number	7.62	8.12
2.	Total Suspended Solids	mg/L	74	10
3.	Total Dissolved Solids	mg/L	20592	-
4.	Chlorides	mg/L	14050	-
5.	Sulphates	mg/L	415	-
6.	Oils & Grease	mg/L	<1	-
7.	BOD for 3 days at 27 ⁰ C	mg/L	8	5
8.	Chemical Oxygen Demand	mg/L	48	-
9.	Phosphate	mg/L	0.24	-
10.	Cyanide	mg/L	<0.005	-
11.	Phenolic Compounds	mg/L	<0.005	-
12.	Fluoride	mg/L	0.68	-
13.	TRC	mg/L	<1	-
14.	Calcium	mg/L	313	-
15.	Total Chromium	mg/L	<0.003	-
16.	Hexavalent Chromium	mg/L	<0.01	-
17.	Copper	mg/L	0.1172	-
18.	Zinc	mg/L	0.3612	-
19.	Lead	mg/L	0.1410	-
20.	Cadmium	mg/L	<0.008	-
21.	Nickel	mg/L	0.1012	-

Deputy CSO (L.)
DEL, Manali

M/S. TPL - ECH 69



AUGUST 2019

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 47 / 2019-20

Dated : 13.09.2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : Two number of samples
Date and Time of Receipt : 21.08.2019 at 03.00 PM

Code No. & Point of Collection : 1. SR-08/15 - ETP outlet to sea - T
2. SR-08/16 - Outlet from STP - T

Sl.No	Parameters	Unit	1	2
1.	pH	Number	7.06	7.60
2.	Total Suspended Solids	mg/L	56	58
3.	Total Dissolved Solids	mg/L	10628	-
4.	Chlorides	mg/l.	6035	-
5.	Sulphates	mg/l.	368	-
6.	Oils & Grease	mg/L	<1	-
7.	BOD for 3 days at 27 ⁰ C	mg/L	16	11
8.	Chemical Oxygen Demand	mg/L	152	-
9.	Phosphate	mg/l.	1.33	-
10.	Cyanide	mg/L	<0.005	-
11.	Phenolic Compounds	mg/L	<0.005	-
12.	Fluoride	mg/l.	0.88	-
13.	TRC	mg/l.	<1	-
14.	Calcium	mg/l.	2645	-
15.	Total Chromium	mg/L	<0.003	-
16.	Hexavalent Chromium	mg/l.	<0.01	-
17.	Copper	mg/L	0.6729	-
18.	Zinc	mg/l.	0.3768	-
19.	Lead	mg/l.	<0.015	-
20.	Cadmium	mg/L	<0.008	-
21.	Nickel	mg/L	<0.006	-

Kanika Leonard
Deputy CSO (L) 20/9/19
DEL., Manali

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M/s. TPL - ECH



OCT 2019

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 64 / 2019-20

Dated : 21.11.2019

Name of the Sender : DEE/Ambattur
Nature and Number of sample : Two number of samples
Date and Time of Receipt : 11.10.2019 at 11.00 AM

Code No. & Point of Collection : 1. SR-10/05 - ETP outlet to sea - T
2. SR-10/06 - Outlet from STP - T

Sl.No	Parameters	Unit	1	2
1.	pH	Number	7.78	7.76
2.	Total Suspended Solids	mg/L	32	14
3.	Total Dissolved Solids	mg/L	22452	-
4.	Chlorides	mg/L	13210	-
5.	Sulphates	mg/L	384	-
6.	Oils & Grease	mg/L	<1	-
7.	BOD for 3 days at 27 ^o C	mg/L	7	5
8.	Chemical Oxygen Demand	mg/L	64	-
9.	Phosphate	mg/L	<0.15	-
10.	Cyanide	mg/L	<0.005	-
11.	Phenolic Compounds	mg/L	<0.005	-
12.	Fluoride	mg/L	0.76	-
13.	TRC	mg/L	2	-
14.	Calcium	mg/L	200	-
15.	Total Chromium	mg/L	<0.003	-
16.	Hexavalent Chromium	mg/L	<0.01	-
17.	Copper	mg/L	0.1280	-
18.	Zinc	mg/L	0.4381	-
19.	Lead	mg/L	0.0290	-
20.	Cadmium	mg/L	0.0189	-
21.	Nickel	mg/L	0.1010	-

[Signature]
21/11/19
CSO (L)
DEL, Manali



M/s. TPL - ECH 71

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

Nov 2019

ROA No. 75 / 2019-20

Dated : 26.01.2020

Name of the Sender

: DEE/Ambattur

Nature and Number of sample

: Two number of samples

Date and Time of Receipt

: 29.11.2019 at 04.15 PM

Code No. & Point of Collection

: 1. SR-52/11 - ETP outlet to sea - T
2. SR-53/11 - Outlet from STP - T

Sl.No	Parameters	Unit	1	2
1.	pH	Number	7.06	7.62
2.	Total Suspended Solids	mg/L	88	12
3.	Total Dissolved Solids	mg/L	10446	-
4.	Chlorides	mg/L	6035	-
5.	Sulphates	mg/L	172	-
6.	Oils & Grease	mg/L	<1	-
7.	BOD for 3 days at 27 ^o C	mg/L	4	10
8.	Chemical Oxygen Demand	mg/L	32	-
9.	Phosphate	mg/L	0.24	-
10.	Cyanide	mg/L	<0.005	-
11.	Phenolic Compounds	mg/L	<0.005	-
12.	Fluoride	mg/L	0.69	-
13.	TRC	mg/L	29	-
14.	Calcium	mg/L	2365	-
15.	Total Chromium	mg/L	<0.003	-
16.	Hexavalent Chromium	mg/L	<0.01	-
17.	Copper	mg/L	0.0416	-
18.	Zinc	mg/L	0.2712	-
19.	Lead	mg/L	0.1788	-
20.	Cadmium	mg/L	0.0140	-
21.	Nickel	mg/L	0.1838	-

[Signature]
CSO (L) 26/1/2020
DEL, Manali

M/S. TPL - ECH
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TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

DEC 2018

ROA No. 86 / 2019-20

Dated : 28.01.2020

Name of the Sender : DEE/Ambattur
Nature and Number of sample : Two number of samples
Date and Time of Receipt : 27.12.2019 at 03.30 PM

Code No. & Point of Collection : 1. SR-31/12 - ETP outlet to Sea - T
2. SR-32/12 - Outlet from STP - T

Sl.No	Parameters	Unit	1	2
1.	pH	Number	7.36	7.70
2.	Total Suspended Solids	mg/L	34	18
3.	Total Dissolved Solids	mg/L	18012	-
4.	Chlorides	mg/L	15465	-
5.	Sulphates	mg/L	313	-
6.	Oils & Grease	mg/L	<1	-
7.	BOD for 3 days at 27 ^o C	mg/L	8	4
8.	Chemical Oxygen Demand	mg/L	64	-
9.	Phosphate	mg/L	0.47	-
10.	Cyanide	mg/L	<0.005	-
11.	Phenolic Compounds	mg/L	<0.005	-
12.	Fluoride	mg/L	0.88	-
13.	TRC	mg/L	<1	-
14.	Calcium	mg/L	96	-
15.	Total Chromium	mg/L	<0.003	-
16.	Hexavalent Chromium	mg/L	<0.01	-
17.	Copper	mg/L	<0.0015	-
18.	Zinc	mg/L	0.4703	-
19.	Lead	mg/L	0.3854	-
20.	Cadmium	mg/L	0.0078	-
21.	Nickel	mg/L	0.3795	-

P.L. Srinivasan
28/1/2020
CSO (L)
DEL, Manali



H/S TPL - ECH 73

JAN 2020

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 96 / 2019-20

Dated : 09.03.2020

Name of the Sender : DEE/Ambattur
Nature and Number of sample : Two number of samples
Date and Time of Receipt : 31.01.2020 at 05.30 PM

Code No. & Point of Collection : 1. SR-42/01 - ETP outlet to Sea - T
2. SR-43/01 - Outlet from STP - T

Sl.No	Parameters	Unit	1	2
1.	pH	Number	7.23	7.75
2.	Total Suspended Solids	mg/L	22	12
3.	Total Dissolved Solids	mg/L	10574	-
4.	Chlorides	mg/L	9588	-
5.	Sulphates	mg/L	63	-
6.	Oils & Grease	mg/L	<1	-
7.	BOD for 3 days at 27 ^o C	mg/L	11	7
8.	Chemical Oxygen Demand	mg/L	80	-
9.	Phosphate	mg/L	0.36	-
10.	Cyanide	mg/l.	<0.005	-
11.	Phenolic Compounds	mg/L	<0.005	-
12.	Fluoride	mg/L	0.76	-
13.	TRC	mg/l.	17	-
14.	Calcium	mg/L	46	-
15.	Total Chromium	mg/L	<0.003	-
16.	Hexavalent Chromium	mg/L	<0.01	-
17.	Copper	mg/L	0.0489	-
18.	Zinc	mg/l.	0.7005	-
19.	Lead	mg/l.	0.3180	-
20.	Cadmium	mg/l.	0.0497	-
21.	Nickel	mg/L	0.5582	-

CSO (L)
DEL, Manali
9/3/2020



TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 97 / 2019-20

Dated : 17.03.2020

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T/S. TPL - ECH
Feb 2020

Name of the Sender : DEE/Ambattur
Nature and Number of sample : One number of sample
Date and Time of Receipt : 06.02.2020 at 04.30 PM
Code No. & Point of Collection : 1. SR - 25/02 - ETP outlet to sea -- T

Sl.No	Parameters	Unit	1
1.	pH	Number	7.10
2.	Total Suspended Solids	mg/L	36
3.	Total Dissolved Solids	mg/L	27302
4.	Chlorides	mg/L	19568
5.	Sulphates	mg/L	86
6.	Oils & Grease	mg/L	<1
7.	BOD for 3 days at 27 ^o C	mg/L	6
8.	Chemical Oxygen Demand	mg/L	208
9.	Phosphate	mg/L	<0.15
10.	Cyanide	mg/L	<0.005
11.	Phenolic Compounds	mg/L	<0.005
12.	Fluoride	mg/L	0.95
13.	TRC	mg/L	<1
14.	Calcium	mg/L	12826
15.	Total Chromium	mg/L	<0.003
16.	Hexavalent Chromium	mg/L	<0.01
17.	Copper	mg/L	<0.0015
18.	Zinc	mg/L	0.5842
19.	Lead	mg/L	0.0346
20.	Cadmium	mg/L	<0.008
21.	Nickel	mg/L	0.1448

CSO (L)
DEL, Manali



M/S. TPL - ECH 75

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

MAY 2020

ROA No. 03 / 2020-21

Dated : 11.09.2020

Name of the Sender : DEE/Ambattur
Nature and Number of sample : Two number of samples
Date and Time of Receipt : 27.05.2020 at 05.20 PM
Code No. & Point of Collection : 1. SR-20/05 - ETP outlet to Sea - T
2. SR-21/05 - Outlet from STP - T

Sl.No	Parameters	Unit	1	2
1.	pH	Number	8.16	7.83
2.	Total Suspended Solids	mg/L	36	12
3.	Total Dissolved Solids	mg/L	20356	-
4.	Chlorides	mg/L	12296	-
5.	Sulphates	mg/L	157	-
6.	Oils & Grease	mg/L	<1	-
7.	BOD for 3 days at 27 ^o C	mg/L	17	5
8.	Chemical Oxygen Demand	mg/L	*	*
9.	Phosphate	mg/L	<0.15	-
10.	Cyanide	mg/L	<0.005	-
11.	Phenolic Compounds	mg/L	<0.005	-
12.	Fluoride	mg/L	0.59	-
13.	TRC	mg/L	<1	-
14.	Calcium	mg/L	345	-
15.	Total Chromium	mg/L	<0.003	-
16.	Hexavalent Chromium	mg/L	<0.01	-
17.	Copper	mg/L	IF	-
18.	Zinc	mg/L		-
19.	Lead	mg/L		-
20.	Cadmium	mg/L		-
21.	Nickel	mg/L		-
22.	Ammonical Nitrogen	mg/L	-	6
23.	Total Nitrogen	mg/L	-	<2
24.	Faecal Coliform	mg/L	-	**

* -- COD not performed
** -- Faecal Coliform Not Analysed
IF - Instrument failure (AAS)

Done
11/9/2020
CSO (L)
DEL, Manali



7/5 TPL - ECH 77

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

August 2020

ROA No. 18 / 2020-21

Dated : 11.09.2020

Name of the Sender : DEE/Ambattur
Nature and Number of sample : Two number of samples
Date and Time of Receipt : 28.08.2020 at 04.15 PM
Code No. & Point of Collection : 1. SR-19/08 - ETP outlet to Sea - T
2. SR-20/08 - Outlet from STP - T

Sl.No	Parameters	Unit	1	2
1.	pH	Number	6.27	8.11
2.	Total Suspended Solids	mg/L	32	10
3.	Total Dissolved Solids	mg/L	33860	-
4.	Chlorides	mg/L	28491	-
5.	Sulphates	mg/L	368	-
6.	Oils & Grease	mg/L	<1	-
7.	BOD for 3 days at 27 ⁰ C	mg/L	14	6
8.	Chemical Oxygen Demand	mg/L	*	*
9.	Phosphate	mg/L	0.37	-
10.	Cyanide	mg/L	<0.005	-
11.	Phenolic Compounds	mg/L	<0.005	-
12.	Fluoride	mg/L	0.60	-
13.	TRC	mg/L	<1	-
14.	Calcium	mg/L	3607	-
15.	Total Chromium	mg/L	<0.003	-
16.	Hexavalent Chromium	mg/L	<0.01	-
17.	Copper	mg/L	IF	-
18.	Zinc	mg/L		-
19.	Lead	mg/L		-
20.	Cadmium	mg/L		-
21.	Nickel	mg/L		-
22.	Ammonical Nitrogen	mg/L	-	<5
23.	Total Nitrogen	mg/L	-	<2
24.	Faecal Coliform	mg/L	-	**

* -- COD not performed
** -- Faecal Coliform Not Analysed
IF - Instrument failure (AAS)

CSO (L)
11/9/2020 DEL, Manali



TPL - ECH

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TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

SEP 2020

REPORT OF ANALYSIS

ROA No. 29 / 2020-21

Dated : 08.10.2020

Name of the Sender : DEE/Ambattur
Nature and Number of sample : Two number of samples
Date and Time of Receipt : 18.09.2020 at 05.30 PM
Code No. & Point of Collection : 1. SR-24/09 - ETP outlet to Sea - T
2. SR-25/09 - Outlet from STP - T

Sl.No	Parameters	Unit	1	2
1.	pH	Number	8.40	7.09
2.	Total Suspended Solids	mg/L	6	18
3.	Total Dissolved Solids	mg/L	918	-
4.	Chlorides	mg/L	340	-
5.	Sulphates	mg/L	81	-
6.	Oils & Grease	mg/L	<1	-
7.	BOD for 3 days at 27 ^o C	mg/L	2	8
8.	Chemical Oxygen Demand	mg/L	*	*
9.	Phosphate	mg/L	<0.15	-
10.	Cyanide	mg/L	<0.005	-
11.	Phenolic Compounds	mg/L	<0.005	-
12.	Fluoride	mg/L	<1	-
13.	TRC	mg/L	<1	-
14.	Calcium	mg/L	112	-
15.	Total Chromium	mg/L	<0.003	-
16.	Hexavalent Chromium	mg/L	<0.01	-
17.	Copper	mg/L	<0.0015	-
18.	Zinc	mg/L	0.1717	-
19.	Lead	mg/L	<0.015	-
20.	Cadmium	mg/L	<0.008	-
21.	Nickel	mg/L	<0.006	-
22.	Ammonical Nitrogen	mg/L	-	<5
23.	Total Nitrogen	mg/L	-	<2
24.	Faecal Coliform	mg/L	-	**

* -- COD not performed

** -- Faecal Coliform Not Analysed

8/10/2020
CSO (L)
DEL, Manali



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TPL - ECH

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY -- MANALI

REPORT OF ANALYSIS

OCT 2020

ROA No. 41 / 2020-21

Dated : 07.11.2020

Name of the Sender : DEF/Ambattur
Nature and Number of sample : Two number of samples
Date and Time of Receipt : 16.10.2020 at 05.20 PM
Code No. & Point of Collection : 1. SR-42/10 -- ETP outlet to Sea - T
2. SR-43/10 -- Outlet from STP - T

Sl.No	Parameters	Unit	1	2
1.	pH	Number	7.91	7.96
2.	Total Suspended Solids	mg/L	16	8
3.	Total Dissolved Solids	mg/L	23070	-
4.	Chlorides	mg/L	16095	-
5.	Sulphates	mg/L	196	-
6.	Oils & Grease	mg/l.	<1	-
7.	BOD for 3 days at 27 ^o C	mg/l.	8	4
8.	Chemical Oxygen Demand	mg/l.	48	8
9.	Phosphate	mg/l.	<0.15	-
10.	Cyanide	mg/l.	<0.005	-
11.	Phenolic Compounds	mg/l.	<0.005	-
12.	Fluoride	mg/l.	<1	-
13.	TRC	mg/l.	<1	-
14.	Calcium	mg/L	3206	-
15.	Total Chromium	mg/L	<0.003	-
16.	Hexavalent Chromium	mg/l.	<0.01	-
17.	Copper	mg/l.	<0.0015	-
18.	Zinc	mg/L	0.3967	-
19.	Lead	mg/l.	0.1006	-
20.	Cadmium	mg/l.	0.0275	-
21.	Nickel	mg/l.	0.3683	-
22.	Ammonical Nitrogen	mg/l.	-	<5
23.	Total Nitrogen	mg/L	-	<2
24.	Faecal Coliform	mg/l.	-	*

* -- Faecal Coliform Not Analysed

AW
7/11/2020

CSO (L)
DEL. Manali



Ms. TPL - ECH

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TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

Nov 2020

ROA No. 52 / 2020-21

Dated : 08.12.2020

Name of the Sender : DEE/Ambattur
Nature and Number of sample : Two number of samples
Date and Time of Receipt : 20.11.2020 at 01.15 PM

Code No. & Point of Collection : 1. SR-32/11 - ETP Outlet to sea - T
2. SR-33/11 - Outlet from STP - T

Sl.No	Parameters	Unit	1	2
1.	pH	Number	7.61	7.72
2.	Total Suspended Solids	mg/L	12	6
3.	Total Dissolved Solids	mg/L	21584	--
4.	Chloride	mg/L	12396	--
5.	Sulphate	mg/L	78	--
6.	Oils & Grease	mg/L	<1	--
7.	BOD for 3 days at 27° C	mg/L	7	5
8.	Chemical Oxygen Demand	mg/L	40	--
9.	Phosphate	mg/L	<0.15	--
10.	Cyanide	mg/L	<0.005	--
11.	Phenolic Compounds	mg/L	<0.005	--
12.	Fluoride	mg/L	0.91	--
13.	TRC	mg/L	<1	--
14.	Calcium	mg/L	6613	--
15.	Total Chromium	mg/L	<0.003	--
16.	Hexavalent Chromium	mg/L	<0.01	--
17.	Copper	mg/L	<0.0015	--
18.	Zinc	mg/L	0.3416	--
19.	Lead	mg/L	0.1039	--
20.	Cadmium	mg/L	0.0164	--
21.	Nickel	mg/L	0.3779	--

8/12/2020
CSO (L)
DEL, Manali



9/5 TPL - ECH 81

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

DEC 2020

ROA No. 76 / 2020-21

Dated : 08.02.2021

Name of the Sender : DEE/Ambattur
Nature and Number of sample : Two number of samples
Date and Time of Receipt : 31.12.2020 at 04.00 PM
Code No. & Point of Collection : 1. SR-79/12 - ETP outlet to Sea - T
2. SR-80/12 - Outlet from STP - T

Sl.No	Parameters	Unit	1	2
1.	pH	Number	6.81	7.48
2.	Total Suspended Solids	mg/L	26	20
3.	Total Dissolved Solids	mg/L	36370	--
4.	Chlorides	mg/L	21993	--
5.	Sulphates	mg/L	27	--
6.	Oils & Grease	mg/L	<1	--
7.	BOD for 3 days at 27 ⁰ C	mg/L	14	12
8.	Chemical Oxygen Demand	mg/L	96	--
9.	Phosphate	mg/L	<0.15	--
10.	Cyanide	mg/L	<0.005	--
11.	Phenolic Compounds	mg/L	<0.005	--
12.	Fluoride	mg/L	0.90	--
13.	TRC	mg/L	<1	--
14.	Calcium	mg/L	15230	--
15.	Total Chromium	mg/L	<0.003	--
16.	Hexavalent Chromium	mg/L	<0.01	--
17.	Copper	mg/L	<0.0015	--
18.	Zinc	mg/L	0.4768	--
19.	Lead	mg/L	<0.015	--
20.	Cadmium	mg/L	<0.008	--
21.	Nickel	mg/L	<0.006	--

for Kanisha Leonard
CSO (L) 9/2/21
DEL, Manali



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T/S. TPL - ECH

JAN 2021

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

ROA No. 79 / 2020-21

Dated : 16.02.2021

Name of the Sender : DEE/Ambattur
Nature and Number of sample : Two number of samples
Date and Time of Receipt : 22.01.2021 at 11.20 AM

Code No. & Point of Collection : 1. SR-33/01 - ETP outlet - T
2. SR-34/01 - Outlet from STP - T

Sl.No	Parameters	Unit	1	2
1.	pH	Number	7.56	7.96
2.	Total Suspended Solids	mg/L	128	14
3.	Total Dissolved Solids	mg/L	13066	--
4.	Chlorides	mg/L	7398	--
5.	Sulphates	mg/L	58	--
6.	BOD for 3 days at 27 ^o C	mg/L	12	8
7.	Chemical Oxygen Demand	mg/L	136	--
8.	Phosphate	mg/L	<0.15	--
9.	Cyanide	mg/L	<0.005	--
10.	Phenolic Compounds	mg/L	<0.005	--
11.	Fluoride	mg/L	1.32	--
12.	TRC	mg/L	19	--
13.	Calcium	mg/L	3647	--
14.	Total Chromium	mg/L	<0.003	--
15.	Hexavalent Chromium	mg/L	<0.01	--
16.	Copper	mg/L	<0.0015	--
17.	Zinc	mg/L	0.4723	--
18.	Lead	mg/L	<0.015	--
19.	Cadmium	mg/L	<0.008	--
20.	Nickel	mg/L	<0.006	--

for Sanitha Leonard
CSO (L) 16/2/21
DEL, Manali



TPL-ECH 83

TAMIL NADU POLLUTION CONTROL BOARD
DISTRICT ENVIRONMENTAL LABORATORY - MANALI

REPORT OF ANALYSIS

FEB 2021

ROA No. 90 / 2020-21

Dated :27.04.2021

Name of the Sender : DEE/Ambattur
Nature and Number of sample : Two number of samples
Date and Time of Receipt : 19.02.2021 at 4.45 PM
Code No. & Point of Collection : 1. SR-55/02 - ETP outlet - T
2. SR-56/02 - Oult let from STP - T

Sl.No	Parameters	Unit	1	2
1.	pH	Number	7.56	8.56
2.	Total Suspended Solids	mg/L	82	12
3.	Total Dissolved Solids	mg/L	30010	--
4.	Chlorides	mg/L	17994	--
5.	Sulphates	mg/L	20	--
6.	BOD for 3 days at 27 ^o C	mg/L	4	3
7.	Chemical Oxygen Demand	mg/L	24	--
8.	Phosphate	mg/L	<0.15	--
9.	Cyanide	mg/L	<0.005	--
10.	Phenolic Compounds	mg/L	<0.005	--
11.	Flouride	mg/L	<1	--
12.	TRC	mg/L	<1	--
13.	Calcium	mg/L	13226	--
14.	Total Chromium	mg/L	<0.003	--
15.	Hexavalent Chromium	mg/L	<0.01	--
16.	Copper	mg/L	<0.0015	--
17.	Zinc	mg/L	0.5614	--
18.	Lead	mg/L	<0.015	--
19.	Cadmium	mg/L	<0.008	--
20.	Nickel	mg/L	<0.006	--

for Kanitha Leonard
CSO (L) 27/4/21
DEL, Manali



Manali Petrochemicals Limited
Ponneri High Road, Manali, Chennai - 600 068.
Phone : 044 - 25941025
Fax : 044-25941199

TREATED EFFLUENT PUMPING SCHEDULE 28.10.2016

- MPL Plant-1 00.00 HRS TO 9.30 HRS
12.30 HRS TO 00.00 HRS
- MPL Plant-2 24 hours (Due to no holding tank)
- TPL-ECH 09.30hours to 12.30 hours
- Kothari 6.30 hrs to 10.30hrs,16.30 to 19:30hrs,01.30 to 4.30 HRS

Please inform plant 1 control room and get concurrence before starting treated effluent to sea.

Contact number 9444047809

1.Mr.T.Thangasagaran (Factory Manager)
Manali Petrochemicals Limited Plant-I
Ponneri High road,Manali,Chennai-68
Mobile 9444393845

Thangasagaran



2.Mr.S.Baskararan (Factory Manager)
Manali Petrochemicals Limited Plant-II
Sathangadu village,Manali,Chennai-68
Mobile 9445796957

S. Baskararan



3.Mr.T. Muthukumarasamy (Factory Manager)
TamilNadu Petro Products Limited (ECH DIVISION)
Manali ,Chennai-68.
Mobile 9444047808



4. Mr.A.R.Ashokkumar(Factory Manager)
Kothari Petrochemicals Limited
Sathangadu village, Manali,Chennai-68
Mobile 9840930891

Ashokkumar



This above time schedule is normally followed for sea disposal pumping.

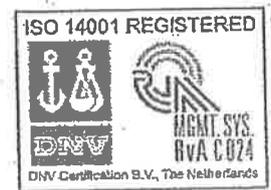
Thanking you,

Yours faithfully,
For MANALI PETROCHEMICALS LTD

G. Balasubramanian

**G.BALASUBRAMANIAN
DIRECTOR (WORKS)**

REGD. OFFICE : "SPIC House" 88, Mount Road, Guindy, Chennai - 600 032.
AN ISO 9001 & 14001 CERTIFIED COMPANY
CIN : L24294TN1986PLC013087 - visit us at : www.manalipetro.com



ANNEXURE – 7A

LAB Plant – Level Indicator at ETP Inlet



LAB Plant – Level Indicator at ETP Outlet



HCD Plant – Level Indicator at ETP Inlet**HCD Plant – Level Indicator at ETP Outlet**

ECH Plant – Level Indicator at ETP Inlet



ECH Plant – Level Indicator at ETP Outlet





Tamilnadu Petroproducts Limited

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TPL/2017/

20th November 2017

The District Environmental Engineer
Tamil Nadu Pollution Control Board
Thiruvallur District
77 - A, South Avenue Road
Ambattur Industrial Estate
CHENNAI - 600 058.

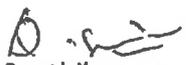
Dear Sir,

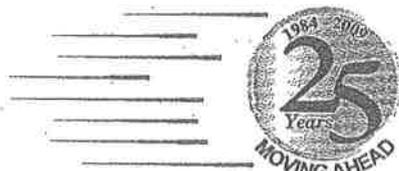
Sub: TPL Plants Treated Effluents - Toxicity Study Report - Submission -
Ref: Inspection Report submitted by CPCB.

With reference to the above subject, we have conducted Toxicity study for the treated effluents generated from TPL plants (LAB & HCD Plants) through M/s. Hubert Enviro Care Systems (P) Ltd, Chennai and a copy of the Toxicity report is attached herewith for your kind reference and compliance.

Thanking you

Yours faithfully
For Tamilnadu Petroproducts Limited


D. Senthikumar
Whole Time Director - Operation.



Regd. Office & Factory :
Post Box No. 9, Manali Express Highway, Manali, Chennai - 600 068. India.
Tel. : (0091) - 44 - 25945500 to 09 Telefax : 044-25945588
Grams " 'PETROPRODUCTS', Website : www.tnpetro.com
CIN : L23200TN1984PLC010931



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Toxicity Study Report
For
TPL Plants (LAB & HCD) Treated Effluents.

Proponent
TAMILNADU PETROPRODUCTS LIMITED.,
Chennai, Tamil Nadu



Report Prepared by

HECS
Hubert Enviro Care Systems (P) Ltd

(An ISO 9001: 2008 Company)

(Accredited by NABL, Recognized by MoEF)

#18, 92nd Street, Ashok Nagar, Chennai – 600 083.

Phone: (044) 42985518 Fax: (044) 42985500

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FOREWORD

M/s. Tamilnadu Petroproducts Limited (TPL) has Operation at Manali, Chennai, Tamil Nadu desired to monitor toxicity study for the treated effluent generated at their plants. They entrusted the work of toxicity study to M/s. Hubert Enviro Care Systems (P) Ltd., Chennai having Environmental Laboratory approved by CPCB / MoEFCC, vide work order TPL/2017 dated 23rd August, 2017.

A comprehensive toxicity study was carried out to monitor the toxicity of effluent released from TPL plants towards the zebra fish based on standard methods. The findings of the toxicity study are presented in this report.

Our sincere thanks are due to Tamilnadu Petroproducts Limited, Manali for awarding this work and authorities for their kind co-operation during the study period.



C. P. Srinivas
Authorized Signatory

1.0 ABOUT HUBERT ENVIRO CARE SYSTEMS PVT LTD

Tamilnadu Petroproducts Limited desired to conduct toxicity study for the treated effluent generated at their plants. They entrusted the work of toxicity study to M/s. Hubert Enviro Care Systems (P) Ltd., Chennai having Environmental Laboratory approved by CPCB/MoEF, vide work order TPL/2017 dated 23rd August, 2017.

Hubert Enviro Care Systems Private Limited (HECS) has an in house research and development (R&D) facility with an approximate floor area of 2000 sq. Ft. HECS provide total pollution control solutions to several industries like Thermal Power Plant, Pharma, R&D Facilities, Electroplating and Manufacturing, IT Parks, Residential Complexes, Dairies, Food Processing, Textile mills, Breweries, etc. Hubert Enviro Care Systems Private Limited is specialized in executing projects right from concept development, supply, erection, commissioning and operation on turnkey basis.

The aim of R&D unit is to improve the current technologies offered by our company to develop innovations that strengthen our position in the marketplace. In Hubert Enviro Care Systems, the team of R&D works in the multidisciplinary fields of environmental biotechnology, development of air monitoring kits, bioremediation, development of cheap and efficient methods for waste water treatment, natural product chemistry and toxicity studies. Apart from that, HECS also enrolled with EIA studies and also deals with consultancy projects.

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2.0 BACKGROUND OF THE COMPANY

2.1 ABOUT TAMILNADU PETROPRODUCTS LIMITED

Tamilnadu Petroproducts Limited (TPL) was incorporated in 1984 as a joint venture between Tamilnadu Industrial Development Corporation Limited (TIDCO) and Southern Petrochemical Industries Corporation Limited (SPIC).

Tamilnadu Petroproducts Ltd (TPL) is one of the leading manufacturers of Linear Alkyl Benzene and Caustic Soda & Chlorine.

TPL is having its manufacturing facilities at Manali Industrial Area in the outskirts of Chennai. Both LAB and HCD plants of TPL are accredited with ISO 9001 and ISO 14001 certification.

2.2 LAB PLANT

2.2.1 Products Manufactured

- Linear Alkyl Benzene
- Heavy alkylate
- Heavy Normal Paraffin

2.2.2 Process description

Prefractionation section

Kerosene obtained from the adjoining Chennai Petroleum Corporation Limited (CPCL) has a boiling range of 140 °C to 270°C. The kerosene is fractionated in two columns to obtain the heart-cut (C₁₀ to C₁₃) between 170 – 250 °C. The balance kerosene is returned to the refinery. The heart-cut also contains unwanted non-normal paraffin, which is removed in the subsequent sections.

Hydrobon section

The product from the pre-fractionation section contains small quantities of Nitrogen and Sulphur compounds, which are injurious to the molecular sieves of the Molex section. Hence, these contaminants are removed by reacting with hydrogen in the presence of metallic oxide catalyst at elevated temperature and pressure to form H₂S and NH₃, which are separated in the downstream of the section. The sulphur contained in the kerosene is thus reduced from 200 – 250 ppm by weight in this section.

MOLEX section

The Molex section essentially consists of molecular sieve beds packed in adsorption chambers. The molecular sieves selectively adsorb normal paraffins. The adsorbed paraffins are desorbed using liquid desorbent (N-Pentane and Iso-Octane). The extracted normal-paraffins and non-normal paraffins (Raffinate) are separated in the respective extract and Raffinate columns. Raffinate is returned to the refinery, while the extract is routed to PACOL section for further processing.

PACOL section

In this section, the extracted normal paraffin is converted to olefins by dehydrogenating the paraffin in the presence of platinum based catalyst at high temperature.

Detergent Alkylate section

Here the olefins along with the unconverted paraffins are reacted with Benzene in the presence of anhydrous Hydrofluoric acid (catalyst) to form Linear Alkyl Benzene (LAB), which is separated in subsequent columns. Heavy Alkylate is a by-product generated in the process on account of reaction of di-olefins generated in the PACOL section with Benzene. The un-reacted normal-paraffins are recycled to the PACOL section.

2.3 HEAVY CHEMICALS DIVISION

2.3.1 Products manufactured

- Caustic Soda
- Liquid Chlorine
- Hydrochloric Acid
- Ammonium Chloride
- Bottled Hydrogen
- Sodium Hypochlorite

2.3.2 Process Description

TPL - HCD employs electrolysis of pure brine using membrane cells to produce 32 % lye and > 99% pure Chlorine and Hydrogen gases as co-products. This 32% Caustic Soda Lye is further concentrated to 48% in the Caustic Evaporation Plant.

The Plant operations have been divided into the following sections:

1. Salt Storage and Handling and brine saturation.
2. Membrane Plant
 - a. Brine Purification
 - b. Cell house
 - c. Brine dechlorination, Chlorine treatment, drying & compression
 - d. Hydrogen treatment
 - e. Hydrochloric Acid Plant
 - f. Waste air dechlorination
 - g. Chlorine Storage & filling
3. Ammonium Chloride Plant
4. Fusion Plant
5. Utilities
6. Storages
7. Captive Power Plant

Salt Storage and Brine saturation

Raw salt procured from coastal areas is brought through trucks and stored in the salt yard in the form of heaps. In the saturators lean brine from the plant gets saturated with salt fed from the heap through bucket elevators.

Membrane Plant**a) Brine Purification**

The concentrated sodium chloride is treated with Sodium Carbonate, Sodium Hydroxide and Barium Carbonate to remove Calcium, Magnesium, Sulphate impurities present in salt.

These impurities are removed as sludge from clarifier bottom and clarifier over flow is filtered through anthracite filter beds. The filtered brine is further polished in two sets of candle filters for removal of suspended impurities. The membrane is sensitive to any cation impurity like Calcium and Magnesium. The dissolved impurities of Calcium and Magnesium are removed to less than 20 ppb in two sets of ion exchange beds and stored in a head tank.

b) Cell House

There are 44 twin electrolyzers in series. The DC current is supplied by a 56 KA, 300 Volts rectifier. The brine is fed to the anode side from the head tank and 28% caustic is fed to the cathode side. Electrolyzers employed are monopolar, DCM 405 * 2, the digit 2 denoting twin cell. One electrolyzer consists of four anodes, four cathodes, two half anodes and two half cathode elements of membranes are positioned between the cathode and anode elements.

The electrolyzers are arranged in two rows to form a series circuit with the rectifier. The individual electrolyzers are electrically connected thro inter-cell busbars and the rows by cross over busbars. The current flows from the rectifier positive side to the anode of first electrolyzer, returning from the cathode of last electrolyzer to the rectifier negative side.

In the anode side, the two phase stream of depleted brine and wet chlorine gas at 80-90 °C overflows from each anode chamber of the electrolyzers and flows by gravity to the anolyte tank where brine & chlorine gas are separated. In the cathode side, the two phase stream of caustic and hydrogen overflows from each cathode chamber of the

electrolysers and flows by gravity to the catholyte tank where caustic and hydrogen gas are separated.

c) Chlorine Treatment, drying, Compression and Liquefaction

The chlorine in the depleted brine is removed by addition of Hydrochloric acid to reduce pH and by applying flash distillation under vacuum. Any further traces of chlorine in the depleted brine are removed by the addition of Sodium Sulphite. After complete dechlorination, the depleted brine is pumped to the saturators. The wet chlorine after getting separated in the anolyte tank is cooled by cooling water. A portion of the chlorine is fed to the HCl unit and the rest is chilled, dried and compressed. A portion of the dry compressed Chlorine is sent to MPL through pipeline and the balance is sent to liquefaction system for liquefaction.

d) Hydrogen Treatment

After cooling the hydrogen is pressurised to 2000mm WC by a blower and sent to hydrogen unit for distributing to various sections. A portion of the membrane hydrogen is utilised for production of Hydrochloric acid in the HCl synthesis unit

e) Hydrochloric Acid synthesis Unit

There are two HCL synthesis units available supplied by M/s.Sigri are of 40 MTPD of chlorine burning capacity each. Wet Chlorine and hydrogen gases are burnt in reactors to form HCL gas which is absorbed by demineralised water to form 33% acid. The heat liberated by the exothermic reaction is removed by circulating cooling water, flowing through the outer side of the reactor. The 33% acid leaves the reactor from the bottom and is collected in receiver tanks.

f) Waste Air dechlorination

The chlorine gas released from the electrolyser and chlorine treatment section during normal and emergency operation is scrubbed with circulated caustic soda solution in two scrubbing towers. The circulated liquid has to be maintained at low temperature and for this chilled water coolers are employed to keep the circulated liquid temperature at about 20 ~ 25 °C. The product formed by this reaction is sodium hypo.

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g) Chlorine Storage & Filling

Liquid Chlorine received in storage tanks is filled in Chlorine cylinders (Tonners).

Ammonium Chloride Unit

This plant was designed by M/s FEDO to produce 30 TPD of Ammonium Chloride crystals with a reactors and a centrifuging and drying system. Hydrogen Chloride gas from HCl unit is combined with gaseous Ammonia and DM water in brick lined reactor to form Ammonium Chloride. The reaction is carried out under vacuum (300 to 340mm Hg) in the reactor. The reaction is instantaneous and Ammonium Chloride formed develops as crystals over the existing ones in the slurry. The slurry is centrifuged and dried to form 99% pure crystals, while the vapours containing traces of Ammonia is scrubbed in a wash tower.

Fusion Plant

The process technology and equipment for fusion Plant was supplied by M/s.Bertrams, Swiss. The plant is capable of producing 85 TPD Flakes. The concentration of 48% to 98% Caustic is done in three stages. In the first stage the Caustic Lye is concentrated to around 55% in the pre concentrator using the heat from exhaust vapours from the final concentrator. Then it is further concentrated to 76% in the rising Film evaporator using steam as the heating medium. Then finally it is concentrated from 76% to 98.5 % in the final concentrator (falling film evaporator) by circulating heat transfer salt at 425°C. The heat transfer salt (mixture of KNO₃, NaNO₂ & NaNO₃) is heated in a vertical furnace where fuel oil and hydrogen are used as fuel in the burner. Molten caustic from the final concentrator is taken to Flaker, where the Flaker drum picks up a thin film of molten caustic which is removed by flaker blades to get Caustic Flakes. The Flaker Drum is cooled internally by cooling water. The flakes are filled in bags.

Captive Power Plant

Captive Power Plant produces power with three Wartsila diesel Generator sets using FO and transfer the same for the TPL – HCD usage at 33 KV.

Utilities

The Utilities Section comprises of Water treatment Plant, Boilers, Cooling Towers, Instrument Air, Service Air and Chilled water system. The water treatment plant generates, Demineralised and Polished Water. Two sets of atmospheric cooling towers for Membrane Plant are available to supply cooling water at a temperature of 30 °C to the heat exchangers. The chilled water system provides Chilled water to the Plant at 10Deg.c. Two fire tube boilers, one of 4tph and one of 5tph capacities are available. 4TPH Boiler is of dual fuel fired type using Hydrogen and fuel oil as fuel for the Boiler.

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3.0 EFFLUENT TREATMENT PLANT

3.1 LAB PLANT - EFFLUENT TREATMENT PLANT

3.1.1 Effluent Sources

The Wastewater generated at the LAB plant can be classified into two streams.

1. The oily process waste stream
2. The non – oily process waste stream

3.1.2 Treatment method

Effluent Treatment Plant

The oily effluent is treated in the Effluent Treatment Plant consisting of oil and grease separators including API separator and Tilted plate separator, Low –rate Bio-filter, settling tank and sludge drying beds.

The oily effluent collected in Collection tank and pumped to tilted plate separator and passed to API Separator to remove oil and grease. Oil removed effluent pumped to Bio – Filter to remove BOD and COD. Bio filter outlet enters the Settling tank. The sludge is being removed periodically from settling tank and dried in Sludge Drying Beds. The treated water enters V-notch chamber and to Final mixing Chamber.

The non-oily effluent is neutralized in Primary Neutralization Tank and Secondary Neutralization tanks. Neutralized effluent collected in Clarifier. Sludge removed from bottom of the clarifier and dried in Sludge Drying Beds. The treated water enters V-notch chamber and finally to Final mixing Chamber. In Final mixing Chamber both treated effluents are mixed together. The mixed treated effluent is pumped to guard pond through sand filter.

3.1.3 Disposal of Treated Effluent

The treated water collected in the Guard pond and pumped to ECH plant for disposal into sea.

3.1.4 Online Monitoring

Online Monitoring System (OLMS) is installed for monitoring of treated effluent for the parameters pH, TSS, BOD, COD and Flow.

The monitoring data has been connected to Tamil Nadu Pollution Control Board (TNPCB) and Central Pollution Control Board (CPCB).

3.2 HCD PLANT - EFFLUENT TREATMENT PLANT

3.2.1 Effluent Sources

The Wastewater generated in the Heavy Division from the following sources:

- Cooling tower blow down
- DM plant effluents
- Boiler Blow down

3.2.2 Treatment method

Effluent Treatment Plant

The waste water generated from the above sources is collected in the main effluent pit. Waste water is neutralized by using Sodium Hydroxide/ Hydrochloric acid and pumped to Treated Effluent pit.

3.2.3 Disposal of Treated Trade Effluent

The treated water is then pumped for disposal into sea.

3.2.4 Online Monitoring

Online Monitoring system is installed for monitoring of treated effluent for the parameter pH, TSS, and Flow.

The monitoring data has been connected to TNPCB and CPCB.

4.0 EFFLUENT CHARACTERIZATION

The purpose of this chapter is to characterize the effluent water released from Tamilnadu Petroproducts Limited plants and to check whether they comply with the state PCB guidelines which will allow the practice to be adopted with complete health and environmental security.

The effluents from LAB & HCD plants were analyzed for the physico-chemical characteristics based on IS Protocols and the findings were presented in Tables.

4.1 LAB Plant

Treated effluents samples were collected from LAB plant for Physio - chemical analysis.

Analysis was performed for the TNPCB prescribed parameters and the results are given in Tables 1.

4.2 HCD Plant

Treated effluents samples were collected from HCD plant for Physio - chemical analysis.

Analysis was performed for the prescribed parameters and the results are given in Tables 2.

Prescribed limits of Tamil Nadu Pollution Control Board are given as Annexure – A.

Table 1: LAB Plant - Treated Effluent Characteristics

S.No	Parameters	Units	Results	Test Method
1	Color	HU	1.0	IS:3025:(Pt 4)1983(Reaff 2006)
2	Odour	NA	Agreeable	IS 3025 (Part5)-1983,Reaff 2006
3	Total suspended Solids	mg/l	4.0	2540D APHA 22nd Edn.. 2012
4	Ph	-	8.10	IS:3025:(Pt 11):1983(Reaff 2006)
5	Total Dissolved Solids	mg/l	770.0	IS:3025:1,(Pt 16)1984(Reaff 2006)
6	Temperature	°C	29.0	IS 3025 (Pt 9):1983(Reaff:2006)
7	Oil & Grease	mg/l	BDL(DL 1)	IS 3025,4(Pt 39):2000 (Reaff 2009)
8	Total Residual Chlorine as Cl ₂	mg/l	BDL(DL 0.1)	IS:3025 (Pt26)1986(Reaff 2009)
9	Ammonical Nitrogen as N	mg/l	3.45	IS 3025 Part (34)1988
10	Total Kjeldahl Nitrogen as N	mg/l	4.62	IS 3025 Part (34)1988
11	BOD, 3 days @ 27°C as O ₂	mg/l	4.0	IS:3025 (Pt 44)1993(Reaff 2009)
12	COD as O ₂	mg/l	24.0	IS 3025 Part (58)2006
13	Lead as Pb	mg/l	BDL(DL0.1)	IS:3025 (Pt 47)1994(Reaff 2009)
14	Chromium (Hexavalent) as Cr ⁶⁺	mg/l	BDL(DL 0.01)	IS 3025 Part (52):2003
15	Total Chromium as Cr	mg/l	BDL(DL 0.01)	IS 3025(Pt 52):2003 (Reaff 2009)
16	Copper as Cu	mg/l	BDL(DL0.05)	IS:3025:5,(Pt 42)1992(Reaff 2009)
17	Zinc as Zn	mg/l	0.11	IS:3025 (Part49)1994(Reaff 2009)
18	Nickel as Ni	mg/l	BDL(DL0.05)	IS:3025 (Part54)2003(Reaff 2009)
19	Boron as B	mg/l	BDL(DL 0.1)	IS 3025:(Part-57):2003(Reaff 2009)
20	Chloride as Cl ⁻	mg/l	306.83	IS 3025(Pt 32):1988(Reaff 2009)
21	Fluoride as F ⁻	mg/l	BDL(DL 0.2)	IS 3025 part (60):2008
22	Dissolved Phosphate as P	mg/l	0.81	IS 3025 (Pt 31):1988 (Reaff 2009)
23	Sulphate as SO ₄	mg/l	82.85	IS:3025:(Part-24):1986(Reaff:2009)
24	Sulphide as S ₂ ⁻	mg/l	BDL(DL 0.04)	IS:3025 (Pt 29)1986(Reaff 2009)
25	Particle Size of Suspended solids	NA	Passed through 850 micron	APHA 22nd Edition
26	Arsenic as As	mg/l	BDL(DL0.005)	IS:3025 (Part37)1988(Reaff 2009)
27	Mercury as Hg	mg/l	BDL(DL0.001)	IS:3025 (Part48)1994 RA 1999
28	Cadmium as Cd	mg/l	BDL(DL0.01)	IS:3025 (Part41)1991
29	Selenium as Se	mg/l	BDL(DL0.005)	IS:3025 (Part56)2003
30	Residual Sodium Carbonate as Na ₂ CO ₃	meq/l	0.2	IS 11624-1986(Reaff 2009)
31	Cyanide as CN	mg/l	BDL(DL 0.01)	IS:3025 (Part27)1986 Reaffirmed 2009
32	Pesticides	mg/l	BDL (DL0.0005)	HECS/W&WW/SOP/063
33	Phenolic Compounds as C ₆ H ₅ OH	mg/l	BDL(DL 0.001)	IS 3025 Part (43)1992,RA 2009
34	Percent Sodium as Na	%	53.78	IS 3025,5 (Pt 45):1993 (Reaff 2006)
35	Free Ammonia as NH ₃	mg/l	BDL(DL 0.02)	IS:3025 (Part34):1998 Reaffirmed

Table 2: HCD Plant - Treated Effluent Characteristics

S.No	Parameters	Units	Results	Test Method
1	Color	HU	1.0	IS:3025:(Pt 4)1983(Reaff 2006)
2	Odour	NA	Agreeable	IS 3025 (Part5)-1983,Reaff 2006
3	Total suspended Solids	mg/l	12.0	2540D APHA 22nd Edn.. 2012
4	pH	-	7.78	IS:3025:(Pt 11):1983(Reaff 2006)
5	Total Dissolved Solids	mg/l	16220.0	IS:3025:1,(Pt 16)1984(Reaff 2006)
6	Temperature	°C	29.0	IS 3025 (Pt 9):1983(Reaff:2006)
7	Oil & Grease	mg/l	BDL(DL 1)	IS 3025,4(Pt 39):2000 (Reaff 2009)
8	Total Residual Chlorine as Cl ₂	mg/l	BDL(DL 0.1)	IS:3025 (Pt26)1986(Reaff 2009)
9	Ammonical Nitrogen as N	mg/l	BDL(DL 0.02)	IS 3025 Part (34)1988
10	Total Kjeldahl Nitrogen as N	mg/l	0.28	IS 3025 Part (34)1988
11	BOD, 3 days @ 27°C as O ₂	mg/l	6.0	IS:3025 (Pt 44)1993(Reaff 2009)
12	COD as O ₂	mg/l	40.0	IS 3025 Part (58)2006
13	Lead as Pb	mg/l	BDL(DL0.1)	IS:3025 (Pt 47)1994(Reaff 2009)
14	Chromium (Hexavalent) as Cr ⁶⁺	mg/l	BDL(DL 0.01)	IS 3025 Part (52):2003
15	Total Chromium as Cr	mg/l	BDL(DL 0.01)	IS 3025(Pt 52):2003 (Reaff 2009)
16	Copper as Cu	mg/l	BDL(DL0.05)	IS:3025:5,(Pt 42)1992(Reaff 2009)
17	Zinc as Zn	mg/l	BDL(DL0.1)	IS:3025 (Part49)1994(Reaff 2009)
18	Nickel as Ni	mg/l	BDL(DL0.05)	IS:3025 (Part54)2003(Reaff 2009)
19	Boron as B	mg/l	BDL(DL 0.1)	IS 3025:(Part-57):2003(Reaff 2009)
20	Chloride as Cl ⁻	mg/l	12866.93	IS 3025(Pt 32):1988(Reaff 2009)
21	Fluoride as F ⁻	mg/l	BDL(DL 0.2)	IS 3025 part (60):2008
22	Dissolved Phosphate as P	mg/l	BDL(DL 0.01)	IS 3025 (Pt 31):1988 (Reaff 2009)
23	Sulphate as SO ₄	mg/l	83.80	IS:3025:(Part-24):1986(Reaff:2009)
24	Sulphide as S ₂ ⁻	mg/l	BDL(DL 0.04)	IS:3025 (Pt 29)1986(Reaff 2009)
25	Particle Size of Suspended solids	NA	Passed through 850 micron	APHA 22nd Edition
26	Arsenic as As	mg/l	BDL(DL0.005)	IS:3025 (Part37)1988(Reaff 2009)
27	Mercury as Hg	mg/l	BDL(DL0.001)	IS:3025 (Part48)1994 RA 1999
28	Cadmium as Cd	mg/l	BDL(DL0.01)	IS:3025 (Part41)1991
29	Selenium as Se	mg/l	BDL(DL0.005)	IS:3025 (Part56)2003
30	Residual Sodium Carbonate as Na ₂ CO ₃	meq/l	0.05	IS 11624-1986(Reaff 2009)
31	Cyanide as CN	mg/l	BDL(DL 0.01)	IS:3025 (Part27)1986 Reaffirmed
32	Pesticides	mg/l	BDL (DL0.0005)	HECS/W&WW/SOP/063
33	Phenolic Compounds as C ₆ H ₅ OH	mg/l	BDL(DL 0.001)	IS 3025 Part (43)1992,RA 2009
34	Percent Sodium as Na	%	90.17%	IS 3025,5 (Pt 45):1993 (Reaff 2006)
35	Free Ammonia as NH ₃	mg/l	BDL(DL 0.02)	IS:3025 (Part34):1998 Reaffirmed

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4.3 Results

It is observed that the LAB & HCD plant effluent as above parameters complies with the Tamil Nadu Pollution Control Board (TNPCB) prescribed standards for treated effluent water. Hence, the effluent released from the Tamilnadu Petroproducts Limited is safe to release into the environment.

5.0 TOXICITY STUDY

It is recognized that a mere detailed physio - chemical analysis of waste water cannot determine its toxicity to marine organism. Thus, toxicity tests are often performed to evaluate the ability of the organism to live in the effluent waters. The test organisms may be plants, benthic animals or fish.

Bio Assay tests are used to determine whether or not an effluent or effluent components is acutely toxic and if toxic, the degree of toxicity. It also serves as a basis for judging whether or not an effluent can be discharged at a given rate without causing direct injury to fish and other aquatic organism in the receiving water due to acute toxicity.

5.1 Scope of the study

The objectives of the present chapter are to investigate the toxicological profile of the effluent generated at Tamilnadu Petroproducts Limited – Laboratory division against the Zebra fish (*Brachydanio rerio*). Zebrafish has been a prominent toxicological model over other vertebrate species due to their size, husbandry, and early morphology

5.2 Methodology

The method employed for the toxicity study is IS IS 6582 (Part 2) (2001, Reaffirmed 2007): (Bio-Assay Methods for Evaluating Acute Toxicity of Industrial Effluents and Waste Waters, Part 2: Using Toxicity Factor to Zebra Fish (*Brachydanio rerio*)).

The method is used for the determination of acute lethal toxicity of industrial effluents to zebra fish under specified conditions.

5.3 Bio Assay Test

5.3.1 Materials Required

Test Fish

Zebra Fish (*Branchidanio rerio*) with uniform size were used for toxicity studies.

Dilution water

Dilution water is prepared by mixing 25 ml each of the following four stock solutions and diluting to 1 litre with water. There after the pH is adjusted using sodium hydroxide or hydrochloric acid solution.

Solution A - Calcium chloride solution - Dissolve 11.76 g of calcium chloride dihydrate ($\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$) in water and dilute to 1 litre.

Solution B - Magnesium sulphate solution - Dissolve 4.93 g of magnesium sulphate heptahydrate ($\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$) in water and dilute to 1 litre.

Solution C - Sodium bicarbonate solution - Dissolve 2.59 g of sodium bicarbonate (NaHCO_3) in water and dilute to 1 litre.

Solution D - Potassium chloride - Dissolve 0.23 g of potassium chloride (KCl) in water and dilute to 1 litre.

Test Solution

Dilution Factor (T) is the numerical expression of volumetric proportion of the waste water in test water. 'T' denotes the toxicity unit. The waste water is mixed with the dilution water in a logarithmic progression scale as follows:

Dilution factor (T)	Ratio of waste water to test water	Parts of Dilution water to be added to one part of waste water (by Volume)
1	1:1	0
2	1:2	1
4	1:4	3
8	1:8	7
16	1:16	15
Control	0:1	1

Apparatus

Glass Beaker – 3 l capacity

Measuring pipettes, Volumetric pipettes, volumetric flasks, Measuring cylinders, Beakers.

Number of test fish

5 Nos. of fishes were used for test.

5.3.2 Procedure

Five consecutive concentrations of waste water were selected based on the type of effluent. In the present investigation, dilution factors 1 to 16 were selected. The test vessels were filled with 2 liter of test solutions of different concentration selected. The vessel containing one liter dilution water alone was kept as control. Each vessel was introduced with five numbers of 24 hrs starved zebra fish (*Brachydanio rerio*). The temperature was maintained at room temperature till the end of the study (96 hrs). The test fish is confirmed as dead if no movement on touch observed. The vessels were observed every 24 hrs for any fish mortality.

The dilution factor of the test solution with the highest concentration of effluent in which all fish survive shall be recorded as Toxicity factor (T_F). T_F denotes the toxicity for fish. T_F is the lowest Dilution Factor T of the Test Water at which all fish survive. Higher the T_F , greater is the toxicity of the tested waste water.

Observation during the test

The fishes were not fed during the course of test

Behaviour of the fishes was observed for 96 hours

Observations are given in Table 3 and 4

Table 3. Fish mortality range with TPL - LAB Plant treated Effluent

Dilution factor (T) of TPL LAB Plant Treated effluent	Number of fish introduced	Number of fish survived after 96 hrs
Control	5	5
1	5	5
2	5	5
4	5	5
8	5	5
16	5	5

Table 4. Fish mortality range with TPL - HCD Plant treated Effluent

Dilution factor (T) of TPL HCD Plant Treated effluent	Number of fish introduced	Number of fish survived after 96 hrs
Control	5	5
1	5	5
2	5	5
4	5	5
8	5	5
16	5	5

Observation after test

No mortality was observed in the control sample and treated effluents samples of both LAB plant and HCD plant.

Results

No mortality was observed in the control sample and TPL plants treated effluents 100 % samples (without any dilution) shows that the treated effluents from LAB plant and HCD plant meets the standards and it is free from acute lethal toxicity.



6.0 CONCLUSION

The effluents released from the TPL LAB and HCD plants were characterized physico-chemically and were found to address the ambient conditions of marine water, current industrial discharges and existing TNPCB regulations.

It is recognized that the detailed physico-chemical analysis of the effluent cannot determine its toxicity towards living organisms. Thus, toxicity tests are performed to evaluate the possibility of harmful chemicals in the effluents by checking the ability of the organisms to live in contaminated water.

From the toxicity study, it is revealed that the test organisms have not experienced any major adverse effect and detorious effect due to the effluent.

No mortality was observed in the treated effluents samples (without any dilution) shows that the treated effluents from TPL plants – LAB plant and HCD plant meets the standards and free from acute lethal toxicity.

Based on the above factors considered, treated effluents from Tamilnadu Petroproducts Limited plants (LAB plant and HCD plant) will not alters the quality of marine water and will not affect aquatic life forms.

Standards for Discharge of Environmental Pollutants

Annexure – A

Ref: Tamilnadu Pollution Control board – Marine Coastal discharge standard

S.No	Parameters	Units	Standard
1	Colour & Odour	HU	----
2	Total suspended Solids	mg/l	Max 100
3	pH	-	5.5 – 9.0
4	Total Dissolved Solids	mg/l	----
5	Temperature	°C	Shall not exceed 5°C above the receiving water temperature.
6	Oil & Grease	mg/l	Max 20.0
7	Total Residual Chlorine as Cl ₂	mg/l	Max 1.0
8	Ammonical Nitrogen as N	mg/l	Max 50.0
9	Total Kjeldahl Nitrogen as N	mg/l	Max 100.0
10	BOD, 3 days @ 27°C as O ₂	mg/l	Max 100.0
11	COD as O ₂	mg/l	Max 250.0
12	Lead as Pb	mg/l	Max 1.0
13	Chromium (Hexavalent) as Cr ₆ ⁺	mg/l	Max 1.0
14	Total Chromium as Cr	mg/l	Max 1.0
15	Copper as Cu	mg/l	Max 3.0
16	Zinc as Zn	mg/l	Max 15.0
17	Nickel as Ni	mg/l	Max 3.0
18	Boron as B	mg/l	Max 2.0
19	Chloride as Cl ⁻	mg/l	----
20	Fluoride as F ⁻	mg/l	Max 15.0
21	Dissolved Phosphate as P	mg/l	----
22	Sulphate as SO ₄	mg/l	Max 1000
23	Sulphide as S ₂ ⁻	mg/l	Max 5.0
24	Particle Size of Suspended solids	NA	Max 850 microns
25	Arsenic as As	mg/l	Max 0.2
26	Mercury as Hg	mg/l	Max 0.01
27	Cadmium as Cd	mg/l	Max 2.0
28	Selenium as Se	mg/l	Max 0.05
29	Residual Sodium Carbonate as Na ₂ CO ₃	meq/l	----
30	Cyanide as CN	mg/l	Max 0.2
31	Pesticides	mg/l	----
32	Phenolic Compounds as C ₆ H ₅ OH	mg/l	Max 5.0
33	Percent Sodium as Na	%	----
34	Free Ammonia as NH ₃	mg/l	Max 5.0

**LAB Plant
ETP – Before Refurbishing – Dec 2020**



Low Rate Bio Filter



Clarifier



Tilted Plate Separator



Polishing Tank



Primary & Secondary Neutraliser



API Separator

LAB –
ETP – After Refurbishing – Jan 2021



Low Rate Bio Filter



Clarifier



Tilted Plate Separator



Polishing Tank



Primary & Secondary Neutraliser



API Separator

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ANNEXURE – 9B

ECH - PO Plant –

Secondary Clarifier – before refurbishing - Dec 2020



Secondary Clarifier – After refurbishing – Feb 2021



To
 Joint Chief Environmental Engineer (M)
 Tamilnadu Pollution Control Board
 Chennai

23.04.2021

Dear Sir,

Consequent to the meeting chaired by your good selves at your office on 21.4.2021 with MPL, TPL & KPL, we herewith committed to comply with the following recommendations given in the Joint Committee report.

- 1) Marine Impact study shall be conducted at the point where the treated trade effluent is being discharged into sea.

Marine Impact study shall be conducted at the point where the treated trade effluent is being discharged into sea through accredited agency once in a year.

MPL will initiate the action plan and cost of the marine impact study will be borne by MPL, TPL and KPL.

- 2) In order to assess the sea water quality, Continuous Marine Water Quality Monitoring system shall be installed at discharge point for the parameters Temperature, Conductivity, Salinity, Turbidity and Total Dissolved Solids (TDS), Dissolved Oxygen (DO), pH, Chlorophyll, fluorescent Dissolved Organic Matter (fDOM) and phycoerythrin-a pigment of blue-green algae etc. The recorded data shall be shared to NIOT & TNPCB for assessing the marine quality.

The installation of the Continuous Marine Water Quality Monitoring system will be at the diffuser point in the sea and the safety/security of the sensors will be at stake since the area is unmanned. The sensors are very costly and there is a chance of security threat. Moreover, most of the reputed vendors are not willing to quote as they could not analyse many parameters given in the list. Hence, we will be representing the NGT to consider installation of the Continuous Marine Water Quality Monitoring system in the effluent line of the common discharge point (in the land) for assessing the parameters given in point no 2. Based on the NGT's direction, we are ready to implement the system for monitoring the parameters and share the recorded data.

MPL will initiate the action plan and cost of the Continuous Marine Water Quality Monitoring system will be borne by MPL, TPL and KPL.

Thanking you

for Kothari Petrochemicals Limited

For

[Handwritten signature]

MPL

M. KARTHIKEYAN
 WTD (M)



For TAMILNADU PETROPRODUCTS LIMITED

[Handwritten signature]

P. SENTHUKUMAR

Area Director (Operations)

TPL

[Handwritten signature]
 M. Rajavel
 Whole Time Director

KPL

**BEFORE THE HON'BLE NATIONAL GREEN
TRIBUNAL
(SOUTHERN ZONE) CHENNAI.**

**O.A.No.19 of 2013,
O.A.No.248 of 2016 and
O.A.No.224 of 2016**

**Meenavargal Mempattu Sangam
..Applicant**

-Vs-

**The Chief Secretary,
Government of Tamil Nadu,
Chennai and others
..Respondents**

**LIST OF ANNEXURES FILED BY
RESPONDENT 8 (In O.A. No. 224 of 2016)**

**M/S. AL. GANTHIMATHI
COUNSEL FOR RESPONDENT**