

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,
PRINCIPAL BENCH, NEW DELHI

Original Application No. 693/2023

News Item titled "Pollution Control Boards
are the weak link" appearing in Deccan Herald
dated 24.10.2023.

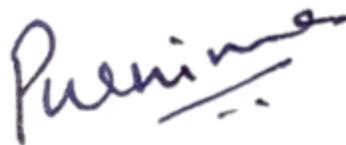
-Vs-

State of Andhra Pradesh through Principal Secretary,
Department of Environment and Forest
And others.

.....Respondents.

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Mrs.Purnima Krishna, Advocate

Counsel for Tamil Nadu Pollution Control Board

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**STATUS REPORT FILED BY THE MEMBER SECRETARY - THE
TAMIL NADU POLLUTION CONTROL BOARD.**

1. I, M. Saravanakumar, Son of Mr. R.Mahalingam, aged about 60 years, having office at No. 76, Mount Salai, Guindy, Chennai – 600 032, do hereby solemnly affirm and sincerely state as follows:
2. I respectfully submit that I am working as the Member Secretary, Tamil Nadu Pollution Control Board (TNPCB), Chennai and I am filing this status report and as such I am well acquainted with the facts of the case from the records available at our office.
3. It is respectfully submitted that on 23.11.2023 the Hon'ble National Green Tribunal, Principal Bench, New Delhi has taken a Suo Motu based on the News item which appeared in Deccan Herald dated 24.10.2023 titled "Pollution Control Boards are the weak link".
4. It is submitted that the news item states that the State Pollution Control Board (SPCB) as also Central Pollution Control Board (CPCB) have miserably failed to effectively contribute in curbing the pollution. It is stated that the PCBs across India are in a state of a shambles, though in course of time, their mandate has been expanded much beyond the water related issues. Referring to a working paper from the Centre for Policy Research, the report states that the SPCBs do not have the resources and capacity to perform the functions assigned to them under various laws due to inadequate sanctioned strength of personnel, high



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number of vacancies especially in technical positions, absence of proper training, lack of pollution monitoring and abatement equipment, absence of technically competent leadership, protracted enforcement mechanisms, insufficient funds and ineffectual spending.

5. It is submitted that on 14.10.2025, the Hon'ble NGT, PB has directed that "All the PCBs of the States/PCCs of UTs are directed to file the status report in terms of the earlier direction". As per the above direction, the Tamil Nadu Pollution Control Board submits the report herein.
6. It is submitted that on 28.01.2025, the Hon'ble NGT, PB has directed Central Pollution Control Board to re-examine the disclosures made by PCBs and the Order of Hon'ble Tribunal, inter alia as follows:

"10.Hence, CPCB is directed to re-examine the disclosures made by PCBs and PCCs in their reports about the laboratory infrastructure and ascertain the gaps/deficiencies/lack of facility including recognition of Laboratories as NABL and Environment Protection Laboratories and disclose it in the next report.

11. In view of the above, States/UTs and PCBs/PCCs who have not filed the reply till now are directed to file it by supplying an advance copy to the CPCB within four weeks and the CPCB is directed to file a fresh report, keeping in view the observations made above and disclosures made by remaining PCBs/PCCs".

7. It is submitted that as per the above direction the Central Pollution Control Board vide letter dated 14.02.2025, has requested all SPCB's/PCCs to provide information as per the formats in the form of the affidavits. In order to maintain uniformity in reporting of information, CPCB has prepared the formats for examining the status of filling vacancies and analytical parameters along with laboratory infrastructure and equipment available, recognition of Laboratories, etc. The details as sought by the CPCB was sent as an affidavit to Central Pollution Control Board on 03.05.2025.

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8. It is submitted that on 14.10.2025, the Hon'ble NGT, PB has directed that all the PCBs of the States/PCCs of UTs are directed to file the status report in terms of the earlier direction dated 28.01.2025 and furnish an advance copy to CPCB. In this regard, a letter was received from the Central Pollution Control Board requested that all SPCB/PCCs to provide information as per the prescribed formats for providing status of vacancy filling, analytical parameters, laboratory infrastructure and equipment, and laboratory recognition.
9. It is submitted that as sought by the CPCB, the Tamil Nadu Pollution Control Board submits the status regarding the sanctioned strength and working strength of state in the Tamil Nadu Pollution Control is enclosed as Annexure – I.

Therefore, it is prayed that this Hon'ble Tribunal may be pleased to pass such order or further orders or other orders as may deem fit and proper in the facts and circumstances of the case and thus render justice.


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VERIFICATION

I, M. Saravanakumar, Son of Mr.R.Mahalingam, working as the Member Secretary, Tamil Nadu Pollution Control Board (TNPCB), Chennai and having office at No.76, Mount Salai, Guindy, Chennai – 32, do hereby verify that the contents of above reply affidavit are true to the best of my knowledge through records.


MEMBER SECRETARY
TAMILNADU POLLUTION CONTROL BOARD
76, MOUNT SALAI, CHENNAI-600 032.

PART A: STATUS OF FILLING OF VACANT POSTS							
Name of the Board / Committee:							
Category of post	Status of Sanctioned posts in Number			Details of current vacancies in number	Action Taken (Approval of the Govt., Engagement agency, Advertisement, Exam date etc.)	The time line by which the vacancy will be filled (in months)	
	Sanctioned	Filled posts as on 31.12.2025	Current Vacancy as on 31.12.2025				
a) Scientific	223	137	86	a) Direct	55	Action is being taken to fill up the vacant post through Tamil Nadu Public Service Commission	
				b) Promotion	31	-	Not attained qualified service as per existing TNPCB Service Regulation Rule, 2010.
				c) Deputation	0	-	
b) Engineering	326	250	76	a) Direct	48	Action is being taken to fill up the 43 vacant post through Tamil Nadu Public Service Commission and remaining 5 posts Out Sourced through Manpower Agencies.	Letter sent to TNPSC for recruitment of 43 Assistant engineers. Will be completed before April 2026. 10 post of Data Entry Operator and 5 post of programmer to be recruited. Ban for recruitment to be lifted by the Govt as per G.O. 108 dt.16.11.2021
				b) Promotion	28	-	Not attained qualified service as per existing TNPCB Service regulation Rule 2010.
				c) Deputation		-	
c) Administration	468	171	297	a) Direct	169	Action is being taken to fill up the 118 vacant post through Tamil Nadu Public Service Commission and remaining 51 posts Out Sourced through Manpower Agencies.	Letter sent to TNPSC for recruitment of (i) 58 post of Assistant (ii) 17 post of Steno typist (Grade III) (iii) 25 Post of Typist (iv) 11 post of Record clerk (v) 2 post of Librarian grade II (vi) 4 post of Data entry operator will be completed before February 2025 and 1 Post of Assistant Statistical Officer to be filled through TNPSC
				b) Promotion	128	-	Not attained qualified service as per existing TNPCB Service regulation Rule 2010.
				c) Deputation		-	
Total	1017	558	459		459		
specific remarks :							

Details	Name	Mobile Number	E mail Id	Whatsapp Number
Dealing Official	Er.S.Indiragandhi, M.E.	8056042157	jcee2chn@tnpcb.gov.in	8056042171
2nd Dealing official	Er.S. Malarvizhi, M.E, M.B.A	8056042463	jceelchn@tnpcb.gov.in	8056042463
	Dr.P.Suganthi Rani, M.E, Ph.D	8056013907		8056013907
	Er.A.Shanmugam, M.Tech, M.B.A	8056042224	acee2chn@tnpcb.gov.in	8056042224
				Remarks, if any Kindly specify the data which have been modified i.e. laboratory parameter/ promotional vacancy/ deputation vacancy/ sanctioned strength etc.
Data Submitted on (Date):	31/12/2025			
Data Updated on (Date):	01/12/2025			

Note: It is requested to please ensure that each sheet is created separately for each laboratory and rename the sheet accordingly . For e.g. Central Laboratory, Regional Laboratory etc

LABORATORY ANALYTICAL FACILITIES

Name of the Board / Committee: Tamil Nadu Pollution Control Board

PART I: Facility available for monitoring of environmental parameters:

S. No.	Parameters	Facilities Available (Yes / No)	If facility is not available, Specify Timeline for addition of this parameter. (in months)	Action Taken for addition of this parameter (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. Sample Matrix / Group of Water and Wastewater					
(a) Physical Tests					
1	Temperature	Yes	-	-	
2	Colour	Yes	-	-	
3	pH	Yes	-	-	
4	Turbidity	Yes	-	-	
5	Conductivity	Yes	-	-	
6	Total Solids	Yes	-	-	
7	Total Dissolved Solids (TDS)	Yes	-	-	
8	Total Suspended Solids (TSS)	Yes	-	-	
(b) Inorganic Tests					
(i) General & Non-metallic					
1	Alkalinity	Yes	-	-	
2	Chloride	Yes	-	-	
3	Cyanide	Yes	-	-	
4	Dissolved oxygen	Yes	-	-	
5	Nitrite nitrogen	Yes	-	-	
6	Nitrate nitrogen	Yes	-	-	
7	Ammonical nitrogen	Yes	-	-	
8	Fluoride	Yes	-	-	

9	Hardness (Total)	Yes	-	-	
10	Calcium	Yes	-	-	
11	Magnesium	Yes	-	-	
12	Phosphate	Yes	-	-	
13	Sulphate	Yes	-	-	
14	Sulphide	Yes	-	-	
15	Total Residual chlorine (TRC)	Yes	-	-	
(ii) Trace Metals Tests					
1	Aluminium (Al)	Yes	-	-	
2	Arsenic (As) Total	Yes	-	-	
3	Barium	Yes	-	-	Facility available only at AEL,Chennai.
4	Boron	Yes	-	-	
5	Chromium (Cr) Hexavalent	Yes	-	-	
6	Chromium (Cr) Total	Yes	-	-	
7	Cadmium (Cd)	Yes	-	-	
8	Cobalt (Co)	Yes	-	-	Facility available only at AEL,Chennai.
9	Copper (Cu)	Yes	-	-	
10	Iron (Fe)	Yes	-	-	
11	Lead (Pb)	Yes	-	-	
12	Manganese (Mn)	Yes	-	-	
13	Mercury (Hg)	Yes	-	-	Facility available only at AEL,Chennai.
14	Nickel (Ni)	Yes	-	-	
15	Potassium (K)	Yes	-	-	
16	Sodium (Na)	Yes	-	-	
17	Vanadium (V)	Yes	-	-	Facility available only at AEL,Chennai.
18	Zinc (Zn)	Yes	-	-	
19	Selenium (Se)	Yes	-	-	Facility available only at AEL,Chennai.
(c) Organics (General) and Trace Organics Tests					
1	Biological Oxygen Demand (BOD)	Yes	-	-	
2	Chemical oxygen demand (COD)	Yes	-	-	
3	Oil & Grease	Yes	-	-	
4	Phenolic Compounds as C6H5OH	Yes	-	-	

5	Benzopyrene	No	-	-	
6	Pesticides				
6.a	Organochlorine Pesticides (OCPs) Tests				
i	Aldrin	Yes	-	-	Facility available only at AEL,Chennai.
ii	Alpha Endosulphan	Yes	-	-	Facility available only at AEL,Chennai.
iii	p,p'-DDT	Yes	-	-	Facility available only at AEL,Chennai.
iv	Alpha-HCH	Yes	-	-	Facility available only at AEL,Chennai.
v	Beta HCH	Yes	-	-	Facility available only at AEL,Chennai.
vi	Beta Endosulphan	Yes	-	-	Facility available only at AEL,Chennai.
vii	Gama-HCH	Yes	-	-	Facility available only at AEL,Chennai.
viii	o,p'-DDT	Yes	-	-	Facility available only at AEL,Chennai.
ix	p,p'-DDE	Yes	-	-	Facility available only at AEL,Chennai.
6.b	Organophosphorus Pesticides (OPPs) Tests				
i	Malathion	Yes	-	-	Facility available only at AEL,Chennai.
ii	Methyl parathion	Yes	-	-	Facility available only at AEL,Chennai.
iii	Chlorpyrifos	Yes	-	-	Facility available only at AEL,Chennai.
iv	Dimethoate	No	6	-	
v	Dieldrin	Yes	-	-	Facility available only at AEL,Chennai.
vi	Ethion	No	6	-	
(d) Microbiological Tests					
1	Total Coliform	Yes	-	-	Facility available in 8 AELs of TNPCB
2	Faecal Coliform	Yes	-	-	Facility available in 8 AELs of TNPCB
3	E. Coli	Yes	-	-	Facility available in 8 AELs of TNPCB
4	Faecal Streptococci	Yes	-	-	Facility available in 8 AELs of TNPCB
(e) Toxicological Tests					
1	Bioassay method for evaluation of toxicity using fish (90% survival of fish after 96 hrs in 100% effluent)	Yes	-	-	Facility available only at AEL,Chennai.
B. Sample Matrix / Group of Solid / Solid Waste					
(a) Soil / Sediment /Compost Tests					
1	Cation Exchange Capacity (CEC)	Yes	-	-	
2	Electrical Conductivity (EC)	Yes	-	-	
3	Organic carbon (Chemical Method)	Yes	-	-	
4	pH	Yes	-	-	

5	Soil moisture	Yes	-	-	
6	Total nitrogen	Yes	-	-	
7	Metals by digestion (As, Cd, Cr, Pb, Ni etc.)	Yes	-	-	
(b) Hazardous Waste (Liquid / Slurry / Sludge / Solid / Semi-Solid) Tests					
1	Corrosivity	No	6	-	
2	Ignitability (Flash Point)	No	6	-	
3	Loss on Drying at 1050C (% Moisture Content)	Yes	-	-	Facility available only at AEL,Chennai.
4	Loss on Drying at 5500C (% Organic Content)	Yes	-	-	Facility available only at AEL,Chennai.
5	pH	Yes	-	-	Facility available only at AEL,Chennai.
6	Organic carbon/matter (Chemical Method)	Yes	-	-	Facility available only at AEL,Chennai.
7	Calorific Value	No	6	-	
8	Toxicity Characteristics leaching procedure (TCLP) Leachate and Metals in Leachate (As,Cd,Cr, Pb, Ni)	Yes	-	-	Facility available only at AEL,Chennai.
C. Sample Matrix / Group of Analytes: Air					
(a) Ambient Air					
1	Nitrogen dioxide as NO2	Yes	-	-	
2	Sulphur dioxide (SO2)	Yes	-	-	
3	Particulate matter (PM10)	Yes	-	-	
4	Particulate matter (PM2.5)	Yes	-	-	
5	Carbon Monoxide	Yes	-	-	
6	Ozone	Yes	-	-	
7	Benzene	No	6	-	
8	Ammonia	Yes	-	-	
9	Metals in Particulate Matter, Pb	Yes	-	-	
10	Metals in Particulate Matter, As	Yes	-	-	
11	Metals in Particulate Matter, Ni	Yes	-	-	
12	Particulate Benzo-a-Pyrene (BaP)	No	-	-	
(b) Stack Gas / Stationary Source Emission					
1	Particulate Matter	Yes	-	-	
2	Sulphur Dioxide	Yes	-	-	

3	Carbon Dioxide	Yes	-	-	
4	Carbon Monoxide (NDIR based Method)	Yes	-	-	Facility available in AEL, Chennai, Madurai & Salem
5	Temperature	Yes	-	-	
6	Moisture	Yes	-	-	
7	Oxygen	Yes	-	-	
8	Oxides of Nitrogen	Yes	-	-	
9	Halides (HCL/HF)	No	-	-	
(c) Noise Level					
1	Ambient Noise level measurement (20 to 140 dB)	Yes	-	-	
2	Source Noise Level Measurement (Industrial process, DG set- 20 to 140dB)	Yes	-	-	
(d) Meteorological Monitoring					
1	Ambient Temperature	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station - Details of 34 nos. of CAAQM stations of TNPCB enclosed as Annexure -I
2	Wind direction	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station - Details of 34 nos. of CAAQM stations of TNPCB enclosed as Annexure -I
3	Wind speed	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station - Details of 34 nos. of CAAQM stations of TNPCB enclosed as Annexure -I
4	Relative Humidity	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station - Details of 34 nos. of CAAQM stations of TNPCB enclosed as Annexure -I
5	Mixing Height	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station - Details of 34 nos. of CAAQM stations of TNPCB enclosed as Annexure -I
PART II: Details of Laboratory Infrastructure (Instruments and Equipment)					

S. No.	Name of Instrument / Equipments	Available Yes / No	If the Instrument / Equipment is not available, Specify Timeline for procurement of this instrument (in months)	Action Taken for procurement of this Instrument / Equipment (Specification finalized / procurement initiated / work awarded / outsourced)
A. List of Instruments / Equipment for Sampling of Water, Wastewater and Soil / Hazardous Wastes				
a) Mandatory Requirements				
1	Portable / Pen type pH meter / pH strip	Yes	-	-
2	Portable Dissolved Oxygen Meter / Field Fixing using chemicals	Yes	-	-
3	Electrical Conductivity meter pen type	yes	-	-
4	Flow meter / Physical flow measuring	No	6	-
5	GPS / Mobile with GPS app	No	6	-
6	Ice Box (2 nos.) (150 litre & 100 litre capacities)	Yes	-	-
7	Thermometer	Yes	-	-
8	Stainless steel bucket with nylon rope and mug	Yes	-	-
9	Ground water level measuring device	No	6	-
10	Scoop / shovel	Yes	-	-
11	Auger / core sampler	No	6	-
b) Optional Requirements				
1	Bottom Sampler / Depth sampler	No	6	-
2	Chloroscope for residual chlorine	No	6	-
3	Vandorn or equivalent water sampler (Automatic sampler when composite sampling to be done)	No	6	-
4	Ekman Dredge	No	6	-
B. List of Instruments / Equipment for Sampling of Ambient Air and Source Emission monitoring				
a) Mandatory Requirements				
1	Fine dust samplers PM2.5 (*4 Nos)	Yes	-	-
2	Respirable Dust Sampler PM 10 (* 4 Nos)	Yes	-	-
3	High Volume Sampler (SPM) (4 Nos)	Yes	-	-
4	Handy Sampler with set of glass impingers (*2 Nos)	No	6	-

5	Low Volume Sampler (LVS)	No	6	-	
6	Tedler bags different sizes	No	6	-	
7	Meteorological tower (All in one telescopic Mast) with sensors comprising wind speed, wind direction, ambient temp., Relative humidity, Solar radiation, rainfall etc.	Yes	-	-	
8	Nitrogen Cylinder portable	No	6	-	
9	Activated Charcoal tubes/ Tenex	No	6	-	
10	Barometer (Digital)	Yes	-	-	Facility available only at AEL,Chennai.
11	Isokinetic Stack Monitoring Kit complete with Stack monitoring instrument panel with inclined cum vertical manometer, Cold Box, Vacuum pump, Glass assembly impingers	Yes	-	-	
12	Modified S type Stainless steel Pitot tube (Standard length) with Assembly	Yes	-	-	
13	Monoblock type, rotary design vacuum pump	Yes	-	-	
14	Orsat Apparatus	Yes	-	-	
15	Source emission monitoring Impingers train set with spare impingers 100 ml & 225 ml capacity	Yes	-	-	
16	Stainless steel heated Sampling Probes with thimble holders short and long	Yes	-	-	
17	Flue Gas analyzer	Yes	-	-	
18	Thermometer/ Thermocouple	Yes	-	-	
19	Calibrator for Noise Meters	Yes	-	-	
20	Digital Sound level (Noise) Metres	Yes	-	-	
21	Portable TOC Analyzer for emission monitoring.	No	6	-	
22	Polyurethane Foam PUF Sampler	No	6	-	
b) Optional Requirements					
1	Anemometer	Yes	-	-	available at CAAQM station(34 Nos.) Meteorological Tower & 1 mobile van of TNPCB
2	Weather Monitoring system	Yes	-	-	available at CAAQM station(34 Nos.) Meteorological Tower & 1 mobile van of TNPCB

3	Wind speed/wind direction monitor	Yes	-	-	available at CAAQM station(34 Nos.) Meteorological Tower & 1 mobile van of TNPCB
4	Continuous Ambient Air Monitoring System, Fixed	Yes	-	-	available at CAAQM station(34 Nos.) Meteorological Tower & 1 mobile van of TNPCB
5	Continuous PM10 Analyzer	Yes	-	-	available at CAAQM station(34 Nos.) Meteorological Tower & 1 mobile van of TNPCB
6	Continuous Ambient Air Monitoring System, Mobile	Yes	-	-	available at CAAQM station(34 Nos.) Meteorological Tower & 1 mobile van of TNPCB
7	Continuous PM2.5 analyzer	Yes	-	-	available at CAAQM station(34 Nos.) Meteorological Tower & 1 mobile van of TNPCB
8	Ambient Nitrogen Oxides (NO-NO2-NOx Analyzer	Yes	-	-	Ammonia analyser included ,available at CAAQM station(34 Nos.) Meteorological Tower & 1 mobile van of TNPCB
9	Ambient Ozone Analyzer	Yes	-	-	available at CAAQM station(34 Nos.) Meteorological Tower & 1 mobile van of TNPCB
10	Ambient BTEX Analyzer	Yes	-	-	available at CAAQM station(34 Nos.) Meteorological Tower & 1 mobile van of TNPCB
11	Multipoint Gas Calibration system	Yes	-	-	available at CAAQM station(34 Nos.) Meteorological Tower & 1 mobile van of TNPCB
12	Ambient Sulphur Dioxide analyzer	Yes	-	-	available at CAAQM station(34 Nos.) Meteorological Tower & 1 mobile van of TNPCB
13	Ambient Carbon Monoxide & Carbon dioxide analyzer	Yes	-	-	available at CAAQM station(34 Nos.) Meteorological Tower & 1 mobile van of TNPCB
14	Total Hydrocarbon analyzer	No	6	-	
15	Ambient Ammonia analyzer	No	6	-	
16	Zero Gas Generator	Yes	-	-	available at CAAQM station(34 Nos.) Meteorological Tower & 1 mobile van of TNPCB
17	Synthetic Air Cylinder	No	6	-	
18	Calibration Gas Cylinders, SO2, NO, CO, NH3, Benzene and Toluene One each with stainless steel Regulators	Yes	-	-	available at CAAQM station(34 Nos.) Meteorological Tower & 1 mobile van of TNPCB
19	Continuous emission monitoring equipment	Yes	-	-	available at CAAQM station(34 Nos.) Meteorological Tower & 1 mobile van of TNPCB
20	19 inch Rack mounting system for air analyzers	Yes	-	-	available at CAAQM station(34 Nos.) Meteorological Tower & 1 mobile van of TNPCB
21	Dry Gas Meter	Yes	-	-	
22	Diesel Exhaust analyzer	No	6	-	
23	Exhaust CO/HC analyzer with Sampling Probe	No	6	-	
24	Automated Noise Monitoring System	Yes	-	-	Facility available only at AEL,Chennai.

25	Integrating Sound level meter	No	6	-	
26	Continuous PM10& PM2.5 Monitoring Analyzer TEOM system	Yes	-	-	(CAAQM station operates based on Beta ray attenuation) Facility available only at AEL,Chennai.
27	Top loading orifice kit for calibration of HVS	Yes	-	-	
28	Permeation tubes (SO2, NO-NO2-NOx,NH3, BTX)	No	-	-	
C. List of Equipment required for processing of Environmental Samples:					
a) Mandatory Requirements					
1	Accelerated Solvent Extraction (ASE) System	No	6	-	
2	Ammonia distillation assembly/TKN Analyzer	Yes	-	-	
3	Analytical Balance 4/5 digit & 6 digit (Digital)	Yes	-	-	
4	Aquarium for Toxicity bioassay test with complete accessories (*4 Nos)	Yes	-	-	Facility available only at AEL,Chennai.
5	Autoclave (*2 Nos)	Yes	-	-	
6	Bacteriological Incubators Stainless steel (*2 Nos)	Yes	-	-	
7	Bio safety cabinets	No	6	-	
8	BOD Incubators (2 nos.)	Yes	-	-	
9	Centrifuge	Yes	-	-	Facility available only at AEL,Chennai & AEL,Coimbatore
10	COD Digestion heated Blocks (2) with capacity 16 nos. or more	Yes	-	-	
11	Cyanide Distillation Assembly (3)	Yes	-	-	
12	Deep Freezer- Capacity 500 litre	Yes	-	-	
13	Laboratory Ball Mill Grinder	No	6	-	
14	Laboratory Grinder	No	6	-	
15	Laminar Flow bench for Microbiological analysis	Yes	-	-	Facility available in 8 AELs of TNPCB
16	Magnetic Stirrer with heating system (*2 Nos)	Yes	-	-	
17	Mechanical Shaker	No	6	-	
18	Membrane Filtration assembly with vacuum pump (2 nos.)	Yes	-	-	Facility available only at AEL,Chennai.
19	Microbial culture refrigerator	No	6	-	

20	Microwave Digester with 16 vessels/ Hot Plate	Yes	-	-	Microwave Digester - available only at AEL,Chennai,Hot Plate available in all labs
21	Muffle Furnace (*1 Nos), Range 1200 C	Yes	-	-	
22	Phenol distillation assembly (3)	Yes	-	-	
23	Plate counter, Manual/Automatic	Yes	-	-	Facility available only at AEL,Chennai.
24	Digestion Chambers/ Fume hood	Yes	-	-	
25	Digital Thermometer & Humidity meter- All lab area	Yes	-	-	
26	Dispensers (Various capacities) up to 5, 10, 25 & 50 ml	Yes	-	-	
27	Filtration Assembly with vacuum pump	Yes	-	-	Facility available only at AEL,Chennai.
28	Fluoride Distillation Assembly (3)	Yes	-	-	
29	Arsenic / Fluoride Glass Distillation assemblies	Yes	-	-	
30	Glass Double Distillation Assembly /Water Purification System	Yes	-	-	
31	Heating mantles (2 nos.)	Yes	-	-	
32	Hot plates (small, Medium and Large) (*2 nos.)	Yes	-	-	
33	Thermo Hygrometer	Yes	-	-	
34	Imhoff Cone	Yes	-	-	Facility available only at AEL,Chennai.
35	Top loading Precision Digital Balance (minimum detection 0.001mg/0.01 mg) with anti-vibration facility- 3 nos. i.e 4/5 Digit (2 nos), - 6 Digit (1 no)	Yes	-	-	
36	Refrigerators Big Size 300 litres or more, double door- 2 nos.	Yes	-	-	
37	Rotary Evaporator (Buchi type) with water recirculating chiller	Yes	-	-	Facility available only at AEL,Chennai.
38	Separating funnel shaker	No	6	-	
39	Soxhlet Apparatus	Yes	-	-	Facility available only at DEL, Manali and DEL, Nagpattinam
40	Solid Phase Extraction (SPE) /SPME Extraction system	No	6	-	
41	Thermometer (Alcohol)	No	6	-	
42	Dry & wet bulb Thermometer	Yes	-	-	

43	Toxicity characteristic leaching procedure (TCLP) Extractors (Zero head and Bottle)	Yes	-	-	Facility available only at AEL,Chennai.
44	Ultra sonic water bath- Capacity 3 litre	Yes	-	-	Facility available only at AEL,Chennai.
45	Water Bath with temperature control (*2 Nos)	No	2	-	Facility avialble in AEL, Vellore, DEL, Nagapattinam and DEL MM Nagar, for other labs procurment under process
46	Water Bath with temp. for mercury sample digestion- 20 BOD Bottles	No	6	-	
D. Analytical Instruments at Environmental Laboratories					
a) Mandatory Requirements					
1	Atomic Absorption spectrometer (AAS)- Flame, Hydride & Graphite Tube Atomizer (GTA)	Yes	-	-	
2	Binocular Stereo Zoom Microscope	No	6	-	
3	Bomb Calorimeter	Yes	-	-	Facility available only at AEL,Chennai.
4	BTX Analyzer with BTX calibrator	No	6	-	
5	Colony counter	Yes	-	-	Facility available only at AEL,Chennai.
6	Conductivity meter- 2 nos.	Yes	-	-	
7	Environment conditioning chamber	No	6	-	
8	Digital Burettes- 50 ml*2, 100 ml*2	No	6	-	
9	Dissolved Oxygen Meter (Bench model)	Yes	-	-	
10	Flame Photometer	Yes	-	-	
11	Flash Point Apparatus	No	6	-	
12	Gas Chromatograph Mass Spectrometer	No	6	-	
13	High Performance Liquid Chromatograph (HPLC)	Yes	-	-	Facility available only at AEL,Chennai.
14	Inductively Coupled Plasma (ICP) Spectrometer-OES	No	6	-	
15	Ion Chromatograph Anion & Cations	No	6	-	
16	Methane and Non Methane (NMHC) Analyzer	No	6	-	
17	Microscope – 100x	No	6	-	
18	Microscope Binocular Research	Yes	-	-	Facility available only at AEL,Chennai.
19	CO (NDIR based) Analyzer	Yes	-	-	Facility available only at AEL,Chennai, AEL, Madurai, ,AEL, Salem.

20	Nephelometer (Turbidity Meter)	Yes	-	-	
21	pH-Meter with combined electrode (3 point)- 2 nos.	Yes	-	-	
22	Specific ion Analyzer with ion selective electrodes	Yes	-	-	Facility available only at AEL,Chennai.
23	Spectrophotometer Visible (Portable)	No	6	-	
24	TKN Analyzer semi-automatic with aluminum block digester	Yes	-	-	
25	UV-Vis Spectrophotometer	Yes	-	-	
26	Moisture Content Analyzer	Yes	-	-	Facility available only at AEL,Chennai.
b) Optional Requirements					
1	Automatic Titration Assembly	No	6	-	
2	Carbon, Hydrogen, Nitrogen and Sulphur (CHNS) Elemental Analyzer	No	6	-	
3	EDXRF Analyzer/WDXRF Analyzer	No	6	-	
4	Fourier-transform infrared Spectrometer (FTIR)	No	6	-	
5	Flocculator (Jar testing apparatus)	No	6	-	
6	Toxic Gas Analyzer	No	6	-	
7	Organic Halogen (AOX/TOX) Analyzer	Yes	-	-	Facility available only at AEL,Chennai.
8	TOC Analyzer	Yes	-	-	Facility available only at AEL,Chennai.
9	High Resolution Mass Spectrometer (HRGC-HRMS)	No	6	-	
10	Inductively Coupled Plasma Mass (ICP-MS) Spectrometer	Yes	-	-	Facility available only at AEL,Chennai.
11	X Ray Fluorescence (XRF) Spectrometer (Portable)	No	6	-	
Specific remarks, if any:					
	Autoclave (*2 Nos)	Only one number is available in all TNPCB labs			

Note: It is requested to please ensure that each sheet is created separately for each laboratory and rename the sheet accordingly . For e.g. Central Laboratory, Regional Laboratory etc

LABORATORY ANALYTICAL FACILITIES

Name of the Board / Committee: Tamil Nadu Pollution Control Board - Advanced Environmental Laboratory, Chennai

PART I: Facility available for monitoring of environmental parameters:

S. No.	Parameters	Facilities Available (Yes / No)	If facility is not available, Specify Timeline for addition of this parameter. (in months)	Action Taken for addition of this parameter (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. Sample Matrix / Group of Water and Wastewater					
(a) Physical Tests					
1	Temperature	Yes	-	-	
2	Colour	Yes	-	-	
3	pH	Yes	-	-	
4	Turbidity	Yes	-	-	
5	Conductivity	Yes	-	-	
6	Total Solids	Yes	-	-	
7	Total Dissolved Solids (TDS)	Yes	-	-	
8	Total Suspended Solids (TSS)	Yes	-	-	
(b) Inorganic Tests					
(i) General & Non-metallic					
1	Alkalinity	Yes	-	-	
2	Chloride	Yes	-	-	
3	Cyanide	Yes	-	-	
4	Dissolved oxygen	Yes	-	-	
5	Nitrite nitrogen	Yes	-	-	
6	Nitrate nitrogen	Yes	-	-	

7	Ammonical nitrogen	Yes	-	-	
8	Fluoride	Yes	-	-	
9	Hardness (Total)	Yes	-	-	
10	Calcium	Yes	-	-	
11	Magnesium	Yes	-	-	
12	Phosphate	Yes	-	-	
13	Sulphate	Yes	-	-	
14	Sulphide	Yes	-	-	
15	Total Residual chlorine (TRC)	Yes	-	-	
(ii) Trace Metals Tests					
1	Aluminium (Al)	Yes	-	-	
2	Arsenic (As) Total	Yes	-	-	
3	Barium	Yes	-	-	
4	Boron	Yes	-	-	
5	Chromium (Cr) Hexavalent	Yes	-	-	
6	Chromium (Cr) Total	Yes	-	-	
7	Cadmium (Cd)	Yes	-	-	
8	Cobalt (Co)	Yes	-	-	
9	Copper (Cu)	Yes	-	-	
10	Iron (Fe)	Yes	-	-	
11	Lead (Pb)	Yes	-	-	
12	Manganese (Mn)	Yes	-	-	
13	Mercury (Hg)	Yes	-	-	
14	Nickel (Ni)	Yes	-	-	
15	Potassium (K)	Yes	-	-	
16	Sodium (Na)	Yes	-	-	
17	Vanadium (V)	Yes	-	-	
18	Zinc (Zn)	Yes	-	-	
19	Selenium (Se)	Yes	-	-	

(c) Organics (General) and Trace Organics Tests					
1	Biological Oxygen Demand (BOD)	Yes	-	-	
2	Chemical oxygen demand (COD)	Yes	-	-	
3	Oil & Grease	Yes	-	-	
4	Phenolic Compounds as C6H5OH	Yes	-	-	
5	Benzopyrene	No	6	-	
6	Pesticides				
6.a	Organochlorine Pesticides (OCPs) Tests				
i	Aldrin	Yes	-	-	
ii	Alpha Endosulphan	Yes	-	-	
iii	p,p'-DDT	Yes	-	-	
iv	Alpha-HCH	Yes	-	-	
v	Beta HCH	Yes	-	-	
vi	Beta Endosulphan	Yes	-	-	
vii	Gama-HCH	Yes	-	-	
viii	o,p'-DDT	Yes	-	-	
ix	p,p'-DDE	Yes	-	-	
6.b	Organophosphorus Pesticides (OPPs) Tests				
i	Malathion	Yes	-	-	
ii	Methyl parathion	Yes	-	-	
iii	Chlorpyrifos	Yes	-	-	
iv	Dimethoate	No	6	-	
v	Dieldrin	Yes	-	-	
vi	Ethion	No	6	-	
(d) Microbiological Tests					
1	Total Coliform	Yes	-	-	
2	Faecal Coliform	Yes	-	-	
3	E. Coli	Yes	-	-	
4	Faecal Streptococci	Yes	-	-	
(e) Toxicological Tests					

1	Bioassay method for evaluation of toxicity using fish (90% survival of fish after 96 hrs in 100% effluent)	Yes	-	-	
B. Sample Matrix / Group of Solid / Solid Waste					
(a) Soil / Sediment /Compost Tests					Facility available for Solid and sediment Tests
1	Cation Exchange Capacity (CEC)	Yes	-	-	
2	Electrical Conductivity (EC)	Yes	-	-	
3	Organic carbon (Chemical Method)	Yes	-	-	
4	pH	Yes	-	-	
5	Soil moisture	Yes	-	-	
6	Total nitrogen	Yes	-	-	
7	Metals by digestion (As, Cd, Cr, Pb, Ni etc.)	Yes	-	-	
(b) Hazardous Waste (Liquid / Slurry / Sludge / Solid / Semi-Solid) Tests					
1	Corrosivity	No	6	-	
2	Ignitability (Flash Point)	No	6	-	
3	Loss on Drying at 1050C (% Moisture Content)	Yes	-	-	
4	Loss on Drying at 5500C (% Organic Content)	Yes	-	-	
5	pH	Yes	-	-	
6	Organic carbon/matter (Chemical Method)	Yes	-	-	
7	Calorific Value	No	6	-	
8	Toxicity Characteristics leaching procedure (TCLP) Leachate and Metals in Leachate (As,Cd,Cr, Pb, Ni)	Yes	-	-	
C. Sample Matrix / Group of Analytes: Air					
(a) Ambient Air					
1	Nitrogen dioxide as NO2	Yes	-	-	
2	Sulphur dioxide (SO2)	Yes	-	-	
3	Particulate matter (PM10)	Yes	-	-	
4	Particulate matter (PM2.5)	Yes	-	-	

5	Carbon Monoxide	No	6	-	
6	Ozone	Yes	-	-	
7	Benzene	Yes	-	-	
8	Ammonia	Yes	-	-	
9	Metals in Particulate Matter, Pb	Yes	-	-	
10	Metals in Particulate Matter, As	Yes	-	-	
11	Metals in Particulate Matter, Ni	Yes	-	-	
12	Particulate Benzo-a-Pyrene (BaP)	No	6	-	
(b) Stack Gas / Stationary Source Emission					
1	Particulate Matter	Yes	-	-	
2	Sulphur Dioxide	Yes	-	-	
3	Carbon Dioxide	Yes	-	-	
4	Carbon Monoxide (NDIR based Method)	Yes	-	-	
5	Temperature	Yes	-	-	
6	Moisture	Yes	-	-	
7	Oxygen	Yes	-	-	
8	Oxides of Nitrogen	Yes	-	-	
9	Halides (HCL/HF)	Yes	-	-	
(c) Noise Level					
1	Ambient Noise level measurement (20 to 140 dB)	Yes	-	-	
2	Source Noise Level Measurement (Industrial process, DG set- 20 to 140dB)	Yes	-	-	
(d) Meteorological Monitoring					
1	Ambient Temperature	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
2	Wind direction	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
3	Wind speed	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
4	Relative Humidity	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station

5	Mixing Height	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
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Specific remarks, if any:

PART II: Details of Laboratory Infrastructure (Instruments and Equipment)

S. No.	Name of Instrument / Equipments	Available Yes / No	If the Instrument / Equipment is not available, Specify Timeline for procurement of this instrument (in months)	Action Taken for procurement of this Instrument / Equipment (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. List of Instruments / Equipment for Sampling of Water, Wastewater and Soil / Hazardous Wastes					
a) Mandatory Requirements					
1	Portable / Pen type pH meter / pH strip	Yes	-	-	
2	Portable Dissolved Oxygen Meter / Field Fixing using chemicals	Yes	-	-	
3	Electrical Conductivity meter pen type	No	6	-	
4	Flow meter / Physical flow measuring	No	6	-	
5	GPS / Mobile with GPS app	No	6	-	
6	Ice Box (2 nos.) (150 litre & 100 litre capacities)	Yes	-	-	
7	Thermometer	Yes	-	-	
8	Stainless steel bucket with nylon rope and mug	Yes	-	-	
9	Ground water level measuring device	No	6	-	
10	Scoop / shovel	Yes			
11	Auger / core sampler	No	6	-	
b) Optional Requirements					

1	Bottom Sampler / Depth sampler	Yes			
2	Chloroscope for residual chlorine	No	6	-	
3	Vandorn or equivalent water sampler (Automatic sampler when composite sampling to be done)	No	6	-	
4	Ekman Dredge	No	6	-	
B. List of Instruments / Equipment for Sampling of Ambient Air and Source Emission monitoring					
a) Mandatory Requirements					
1	Fine dust samplers PM2.5 (*4 Nos)	Yes	-	-	
2	Respirable Dust Sampler PM 10 (* 4 Nos)	Yes	-	-	
3	High Volume Sampler (SPM) (4 Nos)	Yes	-	-	
4	Handy Sampler with set of glass impingers (*2 Nos)	No	6	-	
5	Low Volume Sampler (LVS)	No	6	-	
6	Tedler bags different sizes	No	6	-	
7	Meteorological tower (All in one telescopic Mast) with sensors comprising wind speed, wind direction, ambient temp., Relative humidity, Solar radiation, rainfall etc.	Yes	6	Procurement initiated	available at CAAQM station & Mobile CAAQM)
8	Nitrogen Cylinder portable	No	6	-	
9	Activated Charcoal tubes/ Tenex	No	6	-	
10	Barometer (Digital)	Yes	-	-	
11	Isokinetic Stack Monitoring Kit complete with Stack monitoring instrument panel with inclined cum vertical manometer, Cold Box, Vacuum pump, Glass assembly impingers	Yes	-	-	
12	Modified S type Stainless steel Pitot tube (Standard length) with Assembly	Yes	-	-	
13	Monoblock type, rotary design vacuum pump	Yes	-	-	
14	Orsat Apparatus	Yes	-	-	

15	Source emission monitoring Impingers train set with spare impingers 100 ml & 225 ml capacity	Yes	-	-	
16	Stainless steel heated Sampling Probes with thimble holders short and long	Yes	-	-	
17	Flue Gas analyzer	Yes	-	-	
18	Thermometer/ Thermocouple	Yes	-	-	
19	Calibrator for Noise Meters	Yes	-	-	
20	Digital Sound level (Noise) Metres	Yes	-	-	
21	Portable TOC Analyzer for emission monitoring.	No	6	-	
22	Polyurethane Foam PUF Sampler	No	6	-	
b) Optional Requirements					
1	Anemometer	Yes	-	-	available at CAAQM station & Mobile CAAQM)
2	Weather Monitoring system	Yes	-	-	available at CAAQM station & Mobile CAAQM)
3	Wind speed/wind direction monitor	Yes	-	-	available at CAAQM station & Mobile CAAQM)
4	Continuous Ambient Air Monitoring System, Fixed	Yes	-	-	available at CAAQM station & Mobile CAAQM)
5	Continuous PM10 Analyzer	Yes	-	-	available at CAAQM station & Mobile CAAQM)
6	Continuous Ambient Air Monitoring System, Mobile	Yes	-	-	available at CAAQM station & Mobile CAAQM)
7	Continuous PM2.5 analyzer	Yes	-	-	available at CAAQM station & Mobile CAAQM)
8	Ambient Nitrogen Oxides (NO-NO2-NOx Analyzer	Yes	-	-	including Ammonia Analyser,available at CAAQM station & Mobile CAAQM)
9	Ambient Ozone Analyzer	Yes	-	-	available at CAAQM station & Mobile CAAQM)
10	Ambient BTEX Analyzer	Yes	-	-	available at CAAQM station & Mobile CAAQM)
11	Multipoint Gas Calibration system	Yes	-	-	available at CAAQM station & Mobile CAAQM)
12	Ambient Sulphur Dioxide analyzer	Yes	-	-	available at CAAQM station & Mobile CAAQM)
13	Ambient Carbon Monoxide & Carbon dioxide analyzer	Yes	-	-	available at CAAQM station & Mobile CAAQM)
14	Total Hydrocarbon analyzer	No	6	-	
15	Ambient Ammonia analyzer	No	6	-	
16	Zero Gas Generator	Yes	-	-	

17	Synthetic Air Cylinder	No	6	-	
18	Calibration Gas Cylinders, SO ₂ , NO, CO, NH ₃ , Benzene and Toluene One each with stainless steel Regulators	Yes	-	-	available at CAAQM station & Mobile CAAQM)
19	Continuous emission monitoring equipment	Yes	-	-	available at CAAQM station & Mobile CAAQM)
20	19 inch Rack mounting system for air analyzers	Yes	-	-	available at CAAQM station & Mobile CAAQM)
21	Dry Gas Meter	Yes	-	-	
22	Diesel Exhaust analyzer	No	6	-	
23	Exhaust CO/HC analyzer with Sampling Probe	No	6	-	
24	Automated Noise Monitoring System	Yes	-	-	
25	Integrating Sound level meter	No	-	-	
26	Continuous PM ₁₀ & PM _{2.5} Monitoring Analyzer TEOM system	Yes	-	-	available at CAAQM station(1No & Mobile CAAQM) CAAQM station operates based on Beta ray attenuation
27	Top loading orifice kit for calibration of HVS	Yes	-	-	
28	Permeation tubes (SO ₂ , NO-NO ₂ -NO _x ,NH ₃ , BTX)	No	6	-	
C. List of Equipment required for processing of Environmental Samples:					
a) Mandatory Requirements					
1	Accelerated Solvent Extraction (ASE) System	No	6	-	
2	Ammonia distillation assembly/TKN Analyzer	Yes	-	-	
3	Analytical Balance 4/5 digit & 6 digit (Digital)	Yes	-	-	
4	Aquarium for Toxicity bioassay test with complete accessories (*4 Nos)	Yes	-	-	
5	Autoclave (*2 Nos)	Yes	-	-	
6	Bacteriological Incubators Stainless steel (*2 Nos)	Yes	-	-	
7	Bio safety cabinets	Yes	-	-	

8	BOD Incubators (2 nos.)	Yes	-	-	
9	Centrifuge	Yes	-	-	
10	COD Digestion heated Blocks (2) with capacity 16 nos. or more	Yes	-	-	
11	Cyanide Distillation Assembly (3)	Yes	-	-	
12	Deep Freezer- Capacity 500 litre	Yes	-	-	
13	Laboratory Ball Mill Grinder	No	6	-	
14	Laboratory Grinder	No	6	-	
15	Laminar Flow bench for Microbiological analysis	Yes	-	-	
16	Magnetic Stirrer with heating system (*2 Nos)	Yes	-	-	
17	Mechanical Shaker	No	6	-	
18	Membrane Filtration assembly with vacuum pump (2 nos.)	Yes	-	-	
19	Microbial culture refrigerator	Yes	-	-	
20	Microwave Digester with 16 vessels/ Hot Plate	Yes	-	-	
21	Muffle Furnace (*1 Nos), Range 1200 C	Yes	-	-	
22	Phenol distillation assembly (3)	Yes	-	-	
23	Plate counter, Manual/Automatic	Yes	-	-	Manual available
24	Digestion Chambers/ Fume hood	Yes	-	-	
25	Digital Thermometer & Humidity meter- All lab area	Yes	-	-	
26	Dispensers (Various capacities) up to 5, 10, 25 & 50 ml	Yes	-	-	
27	Filtration Assembly with vacuum pump	Yes	-	-	
28	Fluoride Distillation Assembly (3)	Yes	-	-	
29	Arsenic / Fluoride Glass Distillation assemblies	Yes	-	-	
30	Glass Double Distillation Assembly /Water Purification System	Yes	-	-	
31	Heating mantles (2 nos.)	Yes	-	-	

32	Hot plates (small, Medium and Large) (*2 nos.)	Yes	-	-	
33	Thermo Hygrometer	Yes	-	-	
34	Imhoff Cone	Yes	-	-	
35	Top loading Precision Digital Balance (minimum detection 0.001mg/0.01 mg) with anti-vibration facility- 3 nos. i.e 4/5 Digit (2 nos), - 6 Digit (1 no)	Yes	-	-	
36	Refrigerators Big Size 300 litres or more, double door- 2 nos.	Yes	-	-	
37	Rotary Evaporator (Buchi type) with water recirculating chiller	Yes	-	-	
38	Separating funnel shaker	No	6	-	
39	Soxhlet Apparatus	Yes	-	-	
40	Solid Phase Extraction (SPE) /SPME Extraction system	No	6	-	
41	Thermometer (Alcohol)	No	6	-	
42	Dry & wet bulb Thermometer	Yes	-	-	
43	Toxicity characteristic leaching procedure (TCLP) Extractors (Zero head and Bottle)	Yes	-	-	
44	Ultra sonic water bath- Capacity 3 litre	Yes	-	-	
45	Water Bath with temperature control (*2 Nos)	Yes	-	-	available without temperature control
46	Water Bath with temp. for mercury sample digestion- 20 BOD Bottles	No	6	-	
D. Analytical Instruments at Environmental Laboratories					
a) Mandatory Requirements					
1	Atomic Absorption spectrometer (AAS)- Flame, Hydride & Graphite Tube Atomizer (GTA)	Yes	-	-	
2	Binocular Stereo Zoom Microscope	No	6	--	
3	Bomb Calorimeter	Yes	-	-	
4	BTX Analyzer with BTX calibrator	No	6	-	

5	Colony counter	Yes	-	-	
6	Conductivity meter- 2 nos.	Yes	-	-	
7	Environment conditioning chamber	Yes	-	-	
8	Digital Burettes- 50 ml*2, 100 ml*2	No	6	-	
9	Dissolved Oxygen Meter (Bench model)	Yes	-	-	
10	Flame Photometer	Yes	-	-	
11	Flash Point Apparatus	Yes	-	-	
12	Gas Chromatograph Mass Spectrometer	No	6	-	
13	High Performance Liquid Chromatograph (HPLC)	Yes	-	-	
14	Inductively Coupled Plasma (ICP) Spectrometer-OES	No	6	-	
15	Ion Chromatograph Anion & Cations	No	6	-	
16	Methane and Non Methane (NMHC) Analyzer	No	6	-	
17	Microscope – 100x	No	6	-	
18	Microscope Binocular Research	Yes	-	-	
19	CO (NDIR based) Analyzer	Yes	-	-	
20	Nephelometer (Turbidity Meter)	Yes	-	-	
21	pH-Meter with combined electrode (3 point)- 2 nos.	Yes	-	-	1 No. available
22	Specific ion Analyzer with ion selective electrodes	Yes	-	-	
23	Spectrophotometer Visible (Portable)	No	6	-	
24	TKN Analyzer semi-automatic with aluminum block digester	Yes	-	-	
25	UV-Vis Spectrophotometer	Yes	-	-	
26	Moisture Content Analyzer	Yes	-	-	
b) Optional Requirements					
1	Automatic Titration Assembly	No	6	-	
2	Carbon, Hydrogen, Nitrogen and Sulphur (CHNS) Elemental Analyzer	No	6	-	

Note: It is requested to please ensure that each sheet is created separately for each laboratory and rename the sheet accordingly . For e.g. Central Laboratory, Regional Laboratory etc

LABORATORY ANALYTICAL FACILITIES

Name of the Board / Committee: Tamil Nadu Pollution Control Board - Advanced Environmental Laboratory, Coimbatore

PART I: Facility available for monitoring of environmental parameters:

S. No.	Parameters	Facilities Available (Yes / No)	If facility is not available, Specify Timeline for addition of this parameter. (in months)	Action Taken for addition of this parameter (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. Sample Matrix / Group of Water and Wastewater					
(a) Physical Tests					
1	Temperature	Yes	-	-	
2	Colour	Yes	-	-	
3	pH	Yes	-	-	
4	Turbidity	Yes	-	-	
5	Conductivity	Yes	-	-	
6	Total Solids	Yes	-	-	
7	Total Dissolved Solids (TDS)	Yes	-	-	
8	Total Suspended Solids (TSS)	Yes	-	-	
(b) Inorganic Tests					
(i) General & Non-metallic					
1	Alkalinity	Yes	-	-	
2	Chloride	Yes	-	-	
3	Cyanide	Yes	-	-	
4	Dissolved oxygen	Yes	-	-	

5	Nitrite nitrogen	Yes	-	-	
6	Nitrate nitrogen	Yes	-	-	
7	Ammonical nitrogen	Yes	-	-	
8	Fluoride	Yes	-	-	
9	Hardness (Total)	Yes	-	-	
10	Calcium	Yes	-	-	
11	Magnesium	Yes	-	-	
12	Phosphate	Yes	-	-	
13	Sulphate	Yes	-	-	
14	Sulphide	Yes	-	-	
15	Total Residual chlorine (TRC)	Yes	-	-	
1	Aluminium (Al)	No	6		
2	Arsenic (As) Total	Yes	-	-	
3	Barium	No	6		
4	Boron	Yes	-	-	
5	Chromium (Cr) Hexavalent	Yes	-	-	
6	Chromium (Cr) Total	Yes	-	-	
7	Cadmium (Cd)	Yes	-	-	
8	Cobalt (Co)	Yes	-	-	
9	Copper (Cu)	Yes	-	-	
10	Iron (Fe)	Yes	-	-	
11	Lead (Pb)	Yes	-	-	
12	Manganese (Mn)	Yes	-	-	
13	Mercury (Hg)	No	6	-	
14	Nickel (Ni)	Yes	-	-	
15	Potassium (K)	Yes	-	-	
16	Sodium (Na)	Yes	-	-	
17	Vanadium (V)	No	6	-	

18	Zinc (Zn)	Yes	-	-	
19	Selenium (Se)	No	6	-	
(c) Organics (General) and Trace Organics Tests					
1	Biological Oxygen Demand (BOD)	Yes	-	-	
2	Chemical oxygen demand (COD)	Yes	-	-	
3	Oil & Grease	Yes	-	-	
4	Phenolic Compounds as C6H5OH	Yes	-	-	
5	Benzopyrene	No	6	-	
6	Pesticides				
6.a	Organochlorine Pesticides (OCPs) Tests				
i	Aldrin	No	6	-	
ii	Alpha Endosulphan	No	6	-	
iii	p,p'-DDT	No	6	-	
iv	Alpha-HCH	No	6	-	
v	Beta HCH	No	6	-	
vi	Beta Endosulphan	No	6	-	
vii	Gama-HCH	No	6	-	
viii	o,p'-DDT	No	6	-	
ix	p,p'-DDE	No	6	-	
6.b	Organophosphorus Pesticides (OPPs) Tests				
i	Malathion	No	6	-	
ii	Methyl parathion	No	6	-	
iii	Chlorpyriphos	No	6	-	
iv	Dimethoate	No	6	-	
v	Dieldrin	No	6	-	
vi	Ethion	No	6	-	
(d) Microbiological Tests					
1	Total Coliform	Yes	-	-	
2	Faecal Coliform	Yes	-	-	
3	E. Coli	Yes	-	-	
4	Faecal Streptococci	Yes	-	-	
(e) Toxicological Tests					

1	Bioassay method for evaluation of toxicity using fish (90% survival of fish after 96 hrs in 100% effluent)	No	6	-	
B. Sample Matrix / Group of Solid / Solid Waste					
(a) Soil / Sediment /Compost Tests					Facility available for Solid and sediment Tests
1	Cation Exchange Capacity (CEC)	Yes	-	-	
2	Electrical Conductivity (EC)	Yes	-	-	
3	Organic carbon (Chemical Method)	Yes	-	-	
4	pH	Yes	-	-	
5	Soil moisture	Yes	-	-	
6	Total nitrogen	Yes	-	-	
7	Metals by digestion (As, Cd, Cr, Pb, Ni etc.)	Yes	-	-	except As
(b) Hazardous Waste (Liquid / Slurry / Sludge / Solid / Semi-Solid) Tests					
1	Corrosivity	No	6	-	
2	Ignitability (Flash Point)	No	6	-	
3	Loss on Drying at 1050C (% Moisture Content)	No	6	-	
4	Loss on Drying at 5500C (% Organic Content)	No	6	-	
5	pH	No	6	-	
6	Organic carbon/matter (Chemical Method)	No	6	-	
7	Calorific Value	No	6	-	
8	Toxicity Characteristics leaching procedure (TCLP) Leachate and Metals in Leachate (As,Cd,Cr, Pb, Ni)	No	6	-	
C. Sample Matrix / Group of Analytes: Air					
(a) Ambient Air					
1	Nitrogen dioxide as NO2	Yes	-	-	
2	Sulphur dioxide (SO2)	Yes	-	-	
3	Particulate matter (PM10)	Yes	-	-	
4	Particulate matter (PM2.5)	Yes	-	-	

5	Carbon Monoxide	No	6	-	
6	Ozone	Yes	-	-	
7	Benzene	No	6	-	
8	Ammonia	Yes	-	-	
9	Metals in Particulate Matter, Pb	Yes	-	-	
10	Metals in Particulate Matter, As	Yes	-	-	
11	Metals in Particulate Matter, Ni	Yes	-	-	
12	Particulate Benzo-a-Pyrene (BaP)	No	6	-	
(b) Stack Gas / Stationary Source Emission					
1	Particulate Matter	Yes	-	-	
2	Sulphur Dioxide	Yes	-	-	
3	Carbon Dioxide	Yes	-	-	
4	Carbon Monoxide (NDIR based Method)	No	6	-	
5	Temperature	Yes	-	-	
6	Moisture	Yes	-	-	
7	Oxygen	Yes	-	-	
8	Oxides of Nitrogen	Yes	-	-	
9	Halides (HCL/HF)	Yes	-	-	
(c) Noise Level					
1	Ambient Noise level measurement (20 to 140 dB)	Yes	-	-	
2	Source Noise Level Measurement (Industrial process, DG set- 20 to 140dB)	Yes	-	-	
(d) Meteorological Monitoring					
1	Ambient Temperature	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
2	Wind direction	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
3	Wind speed	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
4	Relative Humidity	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station

1	Bottom Sampler / Depth sampler	Yes	-	-	
2	Chloroscope for residual chlorine	No	6	-	
3	Vandorn or equivalent water sampler (Automatic sampler when composite sampling to be done)	No	6	-	
4	Ekman Dredge	No	6	-	
B. List of Instruments / Equipment for Sampling of Ambient Air and Source Emission monitoring					
a) Mandatory Requirements					
1	Fine dust samplers PM2.5 (*4 Nos)	Yes	-	-	
2	Respirable Dust Sampler PM 10 (* 4 Nos)	Yes	-	-	
3	High Volume Sampler (SPM) (4 Nos)	Yes	-	-	
4	Handy Sampler with set of glass impingers (*2 Nos)	No	6	-	
5	Low Volume Sampler (LVS)	No	6	-	
6	Tedler bags different sizes	No	6	-	
7	Meteorological tower (All in one telescopic Mast) with sensors comprising wind speed, wind direction, ambient temp., Relative humidity, Solar radiation, rainfall etc.	Yes	-	Procurement initiated	available at CAAQM stations (3 Nos.-2 nos. at Coimbatore 1 at Ooty)
8	Nitrogen Cylinder portable	No	6	-	
9	Activated Charcoal tubes/ Tenex	No	6	-	
10	Barometer (Digital)	No	6	-	
11	Isokinetic Stack Monitoring Kit complete with Stack monitoring instrument panel with inclined cum vertical manometer, Cold Box, Vacuum pump, Glass assembly impingers	Yes	-	-	
12	Modified S type Stainless steel Pitot tube (Standard length) with Assembly	Yes	-	-	
13	Monoblock type, rotary design vacuum pump	Yes	-	-	
14	Orsat Apparatus	Yes	-	-	

15	Source emission monitoring Impingers train set with spare impingers 100 ml & 225 ml capacity	Yes	-	-	
16	Stainless steel heated Sampling Probes with thimble holders short and long	Yes	-	-	
17	Flue Gas analyzer	Yes	-	-	
18	Thermometer/ Thermocouple	Yes	-	-	
19	Calibrator for Noise Meters	Yes	-	-	
20	Digital Sound level (Noise) Metres	Yes	-	-	
21	Portable TOC Analyzer for emission monitoring.	No	6	-	
22	Polyurethane Foam PUF Sampler	No	6	-	
b) Optional Requirements					
1	Anemometer	Yes	-	-	available at CAAQM stations (3 Nos.-2 nos. at Coimbatore 1 at Ooty)
2	Weather Monitoring system	Yes	-	-	available at CAAQM stations (3 Nos.-2 nos. at Coimbatore 1 at Ooty)
3	Wind speed/wind direction monitor	Yes	-	-	available at CAAQM stations (3 Nos.-2 nos. at Coimbatore 1 at Ooty)
4	Continuous Ambient Air Monitoring System, Fixed	Yes	-	-	available at CAAQM stations (3 Nos.-2 nos. at Coimbatore 1 at Ooty)
5	Continuous PM10 Analyzer	Yes	-	-	available at CAAQM stations (3 Nos.-2 nos. at Coimbatore 1 at Ooty)
6	Continuous Ambient Air Monitoring System, Mobile	No	6	-	
7	Continuous PM2.5 analyzer	Yes	-	-	available at CAAQM stations (3 Nos.-2 nos. at Coimbatore 1 at Ooty)
8	Ambient Nitrogen Oxides (NO-NO2-NOx Analyzer	Yes	-	-	including Ammonia Analyser ,available at CAAQM stations (3 Nos.-2 nos. at Coimbatore 1 at Ooty)
9	Ambient Ozone Analyzer	Yes	-	-	available at CAAQM stations (3 Nos.-2 nos. at Coimbatore 1 at Ooty)
10	Ambient BTEX Analyzer	Yes	-	-	available at CAAQM stations (3 Nos.-2 nos. at Coimbatore 1 at Ooty)
11	Multipoint Gas Calibration system	Yes	-	-	available at CAAQM stations (3 Nos.-2 nos. at Coimbatore 1 at Ooty)
12	Ambient Sulphur Dioxide analyzer	Yes	-	-	available at CAAQM stations (3 Nos.-2 nos. at Coimbatore 1 at Ooty)

13	Ambient Carbon Monoxide & Carbon dioxide analyzer	Yes	-	-	available at CAAQM stations (3 Nos.-2 nos. at Coimbatore 1 at Ooty)
14	Total Hydrocarbon analyzer	No	6	-	
15	Ambient Ammonia analyzer	No	6	-	
16	Zero Gas Generator	Yes	-	-	available at CAAQM stations (3 Nos.-2 nos. at Coimbatore 1 at Ooty)
17	Synthetic Air Cylinder	No	6	-	
18	Calibration Gas Cylinders, SO ₂ , NO, CO, NH ₃ , Benzene and Toluene One each with stainless steel Regulators	Yes	-	-	available at CAAQM stations (3 Nos.-2 nos. at Coimbatore 1 at Ooty)
19	Continuous emission monitoring equipment	No	6	-	
20	19 inch Rack mounting system for air analyzers	Yes	-	-	available at CAAQM stations (3 Nos.-2 nos. at Coimbatore 1 at Ooty)
21	Dry Gas Meter	Yes	-	-	
22	Diesel Exhaust analyzer	No	6	-	
23	Exhaust CO/HC analyzer with Sampling Probe	No	6	-	
24	Automated Noise Monitoring System	No	6	-	
25	Integrating Sound level meter	Yes	-	-	
26	Continuous PM ₁₀ & PM _{2.5} Monitoring Analyzer TEOM system	Yes	-	-	available at CAAQM stations (3 Nos.-2 nos. at Coimbatore 1 at Ooty), CAAQM station operates based on Beta ray attenuation
27	Top loading orifice kit for calibration of HVS	Yes	-	-	
28	Permeation tubes (SO ₂ , NO-NO ₂ -NO _x , NH ₃ , BTX)	No	6	-	

C. List of Equipment required for processing of Environmental Samples:

a) Mandatory Requirements

1	Accelerated Solvent Extraction (ASE) System	No	6	-	
2	Ammonia distillation assembly/TKN Analyzer	Yes	-	-	
3	Analytical Balance 4/5 digit & 6 digit (Digital)	Yes	-	-	

4	Aquarium for Toxicity bioassay test with complete accessories (*4 Nos)	No	6	-	
5	Autoclave (*2 Nos)	Yes	-	-	1 No.available
6	Bacteriological Incubators Stainless steel (*2 Nos)	Yes	-	-	
7	Bio safety cabinets	Yes	-	-	
8	BOD Incubators (2 nos.)	Yes	-	-	
9	Centrifuge	Yes	-	-	
10	COD Digestion heated Blocks (2) with capacity 16 nos. or more	Yes	-	-	1 No.available
11	Cyanide Distillation Assembly (3)	Yes	-	-	1 No.available
12	Deep Freezer- Capacity 500 litre	Yes	-	-	180 lr available
13	Laboratory Ball Mill Grinder	No	6	-	
14	Laboratory Grinder	No	6	-	
15	Laminar Flow bench for Microbiological analysis	Yes	-	-	
16	Magnetic Stirrer with heating system (*2 Nos)	Yes	-	-	
17	Mechanical Shaker	No	6	-	
18	Membrane Filtration assembly with vacuum pump (2 nos.)	No	6	-	
19	Microbial culture refrigerator	Yes	6	-	
20	Microwave Digester with 16 vessels/ Hot Plate	Yes	6	-	Hot plate available
21	Muffle Furnace (*1 Nos), Range 1200 C	Yes	-	-	
22	Phenol distillation assembly (3)	Yes	-	-	1 No.available
23	Plate counter, Manual/Automatic	No	6	-	
24	Digestion Chambers/ Fume hood	Yes	-	-	
25	Digital Thermometer & Humidity meter- All lab area	Yes	-	-	
26	Dispensers (Various capacities) up to 5, 10, 25 & 50 ml	Yes	-	-	
27	Filtration Assembly with vacuum pump	No	6	-	

28	Fluoride Distillation Assembly (3)	Yes		-	1 No.available
29	Arsenic / Fluoride Glass Distillation assemblies	Yes	-	-	
30	Glass Double Distillation Assembly /Water Purification System	Yes	-	-	water purification system available
31	Heating mantles (2 nos.)	Yes	-	-	
32	Hot plates (small, Medium and Large) (*2 nos.)	Yes	-	-	1 No.available
33	Thermo Hygrometer	Yes	-	-	
34	Imhoff Cone	No	6	-	
35	Top loading Precision Digital Balance (minimum detection 0.001mg/0.01 mg) with anti-vibration facility- 3 nos. i.e 4/5 Digit (2 nos), - 6 Digit (1 no)	Yes	-	-	
36	Refrigerators Big Size 300 litres or more, double door- 2 nos.	Yes	-	-	1 No.available
37	Rotary Evaporator (Buchi type) with water recirculating chiller	No	6	-	
38	Separating funnel shaker	No	6	-	
39	Soxhlet Apparatus	No	6	-	
40	Solid Phase Extraction (SPE) /SPME Extraction system	No	6	-	
41	Thermometer (Alcohol)	No	6	-	
42	Dry & wet bulb Thermometer	Yes	-	-	
43	Toxicity characteristic leaching procedure (TCLP) Extractors (Zero head and Bottle)	No	6	-	
44	Ultra sonic water bath- Capacity 3 litre	No	6	-	
45	Water Bath with temperature control (*2 Nos)	Yes	-	-	
46	Water Bath with temp. for mercury sample digestion- 20 BOD Bottles	No	6	-	

D. Analytical Instruments at Environmental Laboratories
a) Mandatory Requirements

1	Atomic Absorption spectrometer (AAS)- Flame, Hydride & Graphite Tube Atomizer (GTA)	Yes	-	-	
2	Binocular Stereo Zoom Microscope	No	6	-	
3	Bomb Calorimeter	No	6	-	
4	BTX Analyzer with BTX calibrator	No	6	-	
5	Colony counter	No	6	-	
6	Conductivity meter- 2 nos.	Yes	-	-	1 No.available
7	Environment conditioning chamber	Yes	-	-	
8	Digital Burettes- 50 ml*2, 100 ml*2	No	6	-	
9	Dissolved Oxygen Meter (Bench model)	Yes	-	-	
10	Flame Photometer	Yes	-	-	
11	Flash Point Apparatus	No	6	-	
12	Gas Chromatograph Mass Spectrometer	No	6	-	
13	High Performance Liquid Chromatograph (HPLC)	No	6	-	
14	Inductively Coupled Plasma (ICP) Spectrometer-OES	No	6	-	
15	Ion Chromatograph Anion & Cations	No	6	-	
16	Methane and Non Methane (NMHC) Analyzer	No	6	-	
17	Microscope – 100x	No	6	-	
18	Microscope Binocular Research	No	6	-	
19	CO (NDIR based) Analyzer	Yes	-	-	
20	Nephelometer (Turbidity Meter)	Yes	-	-	
21	pH-Meter with combined electrode (3 point)- 2 nos.	Yes	-	-	
22	Specific ion Analyzer with ion selective electrodes	No	6	-	
23	Spectrophotometer Visible (Portable)	Yes	-	-	
24	TKN Analyzer semi-automatic with aluminum block digester	Yes	-	-	

25	UV-Vis Spectrophotometer	Yes	-	-	
26	Moisture Content Analyzer	No	6	-	
b) Optional Requirements					
1	Automatic Titration Assembly	No	6	-	
2	Carbon, Hydrogen, Nitrogen and Sulphur (CHNS) Elemental Analyzer	No	6	-	
3	EDXRF Analyzer/WDXRF Analyzer	No	6	-	
4	Fourier-transform infrared Spectrometer (FTIR)	No	6	-	
5	Flocculator (Jar testing apparatus)	No	6	-	
6	Toxic Gas Analyzer	No	6	-	
7	Organic Halogen (AOX/TOX) Analyzer	No	6	-	
8	TOC Analyzer	No	6	-	
9	High Resolution Mass Spectrometer (HRGC-HRMS)	No	6	-	
10	Inductively Coupled Plasma Mass (ICP-MS) Spectrometer	No	6	-	
11	X Ray Fluorescence (XRF) Spectrometer (Portable)	No	6	-	
Specific remarks, if any:					

Note: It is requested to please ensure that each sheet is created separately for each laboratory and rename the sheet accordingly . For e.g. Central Laboratory, Regional Laboratory etc

LABORATORY ANALYTICAL FACILITIES

Name of the Board / Committee: Tamil Nadu Pollution Control Board - Advanced Environmental Laboratory,Cuddalore

PART I: Facility available for monitoring of environmental parameters:

S. No.	Parameters	Facilities Available (Yes / No)	If facility is not available, Specify Timeline for addition of this parameter. (in months)	Action Taken for addition of this parameter (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. Sample Matrix / Group of Water and Wastewater					
(a) Physical Tests					
1	Temperature	Yes	-	-	
2	Colour	Yes	-	-	
3	pH	Yes	-	-	
4	Turbidity	Yes	-	-	
5	Conductivity	Yes	-	-	
6	Total Solids	Yes	-	-	
7	Total Dissolved Solids (TDS)	Yes	-	-	
8	Total Suspended Solids (TSS)	Yes	-	-	
(b) Inorganic Tests					
(i) General & Non-metallic					
1	Alkalinity	Yes	-	-	
2	Chloride	Yes	-	-	
3	Cyanide	Yes	-	-	

4	Dissolved oxygen	Yes	-	-	
5	Nitrite nitrogen	Yes	-	-	
6	Nitrate nitrogen	Yes	-	-	
7	Ammonical nitrogen	Yes	-	-	
8	Fluoride	Yes	-	-	
9	Hardness (Total)	Yes	-	-	
10	Calcium	Yes	-	-	
11	Magnesium	Yes	-	-	
12	Phosphate	Yes	-	-	
13	Sulphate	Yes	-	-	
14	Sulphide	Yes	-	-	
15	Total Residual chlorine (TRC)	Yes	-	-	
1	Aluminium (Al)	No	6		
2	Arsenic (As) Total	Yes	-	-	
3	Barium	No	6		
4	Boron	Yes	-	-	
5	Chromium (Cr) Hexavalent	Yes	-	-	
6	Chromium (Cr) Total	Yes	-	-	
7	Cadmium (Cd)	Yes	-	-	
8	Cobalt (Co)	Yes	-	-	
9	Copper (Cu)	Yes	-	-	
10	Iron (Fe)	Yes	-	-	
11	Lead (Pb)	Yes	-	-	
12	Manganese (Mn)	Yes	-	-	
13	Mercury (Hg)	Yes	-	-	
14	Nickel (Ni)	Yes	-	-	
15	Potassium (K)	Yes	-	-	
16	Sodium (Na)	Yes	-	-	

17	Vanadium (V)	No	6	-	
18	Zinc (Zn)	Yes	-	-	
19	Selenium (Se)	No	6	-	
(c) Organics (General) and Trace Organics Tests					
1	Biological Oxygen Demand (BOD)	Yes	-	-	
2	Chemical oxygen demand (COD)	Yes	-	-	
3	Oil & Grease	Yes	-	-	
4	Phenolic Compounds as C ₆ H ₅ OH	Yes	-	-	
5	Benzopyrene	No	6	-	
6	Pesticides				
6.a	Organochlorine Pesticides (OCPs) Tests				
i	Aldrin	No	6	-	
ii	Alpha Endosulphan	No	6	-	
iii	p,p'-DDT	No	6	-	
iv	Alpha-HCH	No	6	-	
v	Beta HCH	No	6	-	
vi	Beta Endosulphan	No	6	-	
vii	Gama-HCH	No	6	-	
viii	o,p'-DDT	No	6	-	
ix	p,p'-DDE	No	6	-	
6.b	Organophosphorus Pesticides (OPPs) Tests				
i	Malathion	No	6	-	
ii	Methyl parathion	No	6	-	
iii	Chlorpyriphos	No	6	-	
iv	Dimethoate	No	6	-	
v	Dieldrin	No	6	-	
vi	Ethion	No	6	-	
(d) Microbiological Tests					
1	Total Coliform	Yes	-	-	
2	Faecal Coliform	Yes	-	-	
3	E. Coli	Yes	-	-	

4	Faecal Streptococci	Yes	-	-	
(e) Toxicological Tests					
1	Bioassay method for evaluation of toxicity using fish (90% survival of fish after 96 hrs in 100% effluent)	No	6	-	
B. Sample Matrix / Group of Solid / Solid Waste					
(a) Soil / Sediment /Compost Tests					Facility available for Solid and sediment Tests
1	Cation Exchange Capacity (CEC)	Yes	-	-	
2	Electrical Conductivity (EC)	Yes	-	-	
3	Organic carbon (Chemical Method)	Yes	-	-	
4	pH	Yes	-	-	
5	Soil moisture	Yes	-	-	
6	Total nitrogen	Yes	-	-	
7	Metals by digestion (As, Cd, Cr, Pb, Ni etc.)	Yes	-	-	except As
(b) Hazardous Waste (Liquid / Slurry / Sludge / Solid / Semi-Solid) Tests					
1	Corrosivity	No	6	-	
2	Ignitability (Flash Point)	No	6	-	
3	Loss on Drying at 1050C (% Moisture Content)	No	6	-	
4	Loss on Drying at 5500C (% Organic Content)	No	6	-	
5	pH	No	6	-	
6	Organic carbon/matter (Chemical Method)	No	6	-	
7	Calorific Value	No	6	-	
8	Toxicity Characteristics leaching procedure (TCLP) Leachate and Metals in Leachate (As,Cd,Cr, Pb, Ni)	No	6	-	
C. Sample Matrix / Group of Analytes: Air					
(a) Ambient Air					
1	Nitrogen dioxide as NO2	Yes	-	-	
2	Sulphur dioxide (SO2)	Yes	-	-	

3	Particulate matter (PM10)	Yes	-	-	
4	Particulate matter (PM2.5)	Yes	-	-	
5	Carbon Monoxide	No	6	-	
6	Ozone	Yes	-	-	
7	Benzene	No	6	-	
8	Ammonia	Yes	-	-	
9	Metals in Particulate Matter, Pb	Yes	-	-	
10	Metals in Particulate Matter, As	Yes	-	-	
11	Metals in Particulate Matter, Ni	Yes	-	-	
12	Particulate Benzo-a-Pyrene (BaP)	No	6	-	
(b) Stack Gas / Stationary Source Emission					
1	Particulate Matter	Yes	-	-	
2	Sulphur Dioxide	Yes	-	-	
3	Carbon Dioxide	Yes	-	-	
4	Carbon Monoxide (NDIR based Method)	No	6	-	
5	Temperature	Yes	-	-	
6	Moisture	Yes	-	-	
7	Oxygen	Yes	-	-	
8	Oxides of Nitrogen	Yes	-	-	
9	Halides (HCL/HF)	Yes	-	-	
(c) Noise Level					
1	Ambient Noise level measurement (20 to 140 dB)	Yes	-	-	
2	Source Noise Level Measurement (Industrial process, DG set- 20 to 140dB)	Yes	-	-	
(d) Meteorological Monitoring					
1	Ambient Temperature	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
2	Wind direction	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station

3	Wind speed	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
4	Relative Humidity	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
5	Mixing Height	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station

Specific remarks, if any:

PART II: Details of Laboratory Infrastructure (Instruments and Equipment)

S. No.	Name of Instrument / Equipments	Available Yes / No	If the Instrument / Equipment is not available, Specify Timeline for procurement of this instrument (in months)	Action Taken for procurement of this Instrument / Equipment (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. List of Instruments / Equipment for Sampling of Water, Wastewater and Soil / Hazardous Wastes					
a) Mandatory Requirements					
1	Portable / Pen type pH meter / pH strip	Yes	-	-	pH strip available
2	Portable Dissolved Oxygen Meter / Field Fixing using chemicals	Yes	-	-	Field fixing using chemicals
3	Electrical Conductivity meter pen type	No	6	procurement initiated	
4	Flow meter / Physical flow measuring	No	6	-	
5	GPS / Mobile with GPS app	No	6	-	
6	Ice Box (2 nos.) (150 litre & 100 litre capacities)	Yes	-	-	
7	Thermometer	Yes	-	-	
8	Stainless steel bucket with nylon rope and mug	Yes	-	-	
9	Ground water level measuring device	No	6	-	

10	Scoop / shovel	Yes	-	-	
11	Auger / core sampler	No	6	-	
b) Optional Requirements					
1	Bottom Sampler / Depth sampler	Yes	-	-	
2	Chloroscope for residual chlorine	No	6	-	
3	Vandorn or equivalent water sampler (Automatic sampler when composite sampling to be done)	No	6	-	
4	Ekman Dredge	No	6	-	
B. List of Instruments / Equipment for Sampling of Ambient Air and Source Emission monitoring					
a) Mandatory Requirements					
1	Fine dust samplers PM2.5 (*4 Nos)	Yes	-	-	
2	Respirable Dust Sampler PM 10 (* 4 Nos)	Yes	-	-	
3	High Volume Sampler (SPM) (4 Nos)	Yes	-	-	
4	Handy Sampler with set of glass impingers (*2 Nos)	No	6	-	
5	Low Volume Sampler (LVS)	No	6	-	
6	Tedler bags different sizes	No	6	-	
7	Meteorological tower (All in one telescopic Mast) with sensors comprising wind speed, wind direction, ambient temp., Relative humidity, Solar radiation, rainfall etc.	Yes	-	procurement initiated	available at CAAQM stations (2 Nos.- at Cuddalore)
8	Nitrogen Cylinder portable	No	6	-	
9	Activated Charcoal tubes/ Tenex	No	6	-	
10	Barometer (Digital)	No	6	-	
11	Isokinetic Stack Monitoring Kit complete with Stack monitoring instrument panel with inclined cum vertical manometer, Cold Box, Vacuum pump, Glass assembly impingers	Yes	-	-	
12	Modified S type Stainless steel Pitot tube (Standard length) with Assembly	Yes	-	-	

13	Monoblock type, rotary design vacuum pump	Yes	-	-	
14	Orsat Apparatus	Yes	-	-	
15	Source emission monitoring Impingers train set with spare impingers 100 ml & 225 ml capacity	Yes	-	-	
16	Stainless steel heated Sampling Probes with thimble holders short and long	Yes	-	-	
17	Flue Gas analyzer	Yes	-	-	
18	Thermometer/ Thermocouple	Yes	-	-	
19	Calibrator for Noise Meters	Yes	-	-	
20	Digital Sound level (Noise) Metres	Yes	-	-	
21	Portable TOC Analyzer for emission monitoring.	No	6	-	
22	Polyurethane Foam PUF Sampler	No	6	-	
b) Optional Requirements					
1	Anemometer	Yes	-	-	available at CAAQM stations (2 Nos.- at Cuddalore)
2	Weather Monitoring system	Yes	-	-	available at CAAQM stations (2 Nos.- at Cuddalore)
3	Wind speed/wind direction monitor	Yes	-	-	available at CAAQM stations (2 Nos.- at Cuddalore)
4	Continuous Ambient Air Monitoring System, Fixed	Yes	-	-	available at CAAQM stations (2 Nos.- at Cuddalore)
5	Continuous PM10 Analyzer	Yes	-	-	available at CAAQM stations (2 Nos.- at Cuddalore)
6	Continuous Ambient Air Monitoring System, Mobile	No	6	-	
7	Continuous PM2.5 analyzer	Yes	-	-	available at CAAQM stations (2 Nos.- at Cuddalore)
8	Ambient Nitrogen Oxides (NO-NO2-NOx Analyzer	Yes	-	-	available at CAAQM stations (2 Nos.- at Cuddalore),including Ammonia Analyser
9	Ambient Ozone Analyzer	Yes	-	-	available at CAAQM stations (2 Nos.- at Cuddalore)
10	Ambient BTEX Analyzer	Yes	-	-	available at CAAQM stations (2 Nos.- at Cuddalore)
11	Multipoint Gas Calibration system	Yes	-	-	available at CAAQM stations (2 Nos.- at Cuddalore)
12	Ambient Sulphur Dioxide analyzer	Yes	-	-	available at CAAQM stations (2 Nos.- at Cuddalore)
13	Ambient Carbon Monoxide & Carbon dioxide analyzer	Yes	-	-	available at CAAQM stations (2 Nos.- at Cuddalore)

14	Total Hydrocarbon analyzer	No	6	-	
15	Ambient Ammonia analyzer	No	6	-	
16	Zero Gas Generator	Yes	-	-	available at CAAQM stations (2 Nos.- at Cuddalore)
17	Synthetic Air Cylinder	No	6	-	
18	Calibration Gas Cylinders, SO ₂ , NO, CO, NH ₃ , benzene and Toluene One each with stainless steel Regulators	Yes	-	-	available at CAAQM stations (2 Nos.- at Cuddalore)
19	Continuous emission monitoring equipment	No	6	-	
20	19 inch Rack mounting system for air analyzers	Yes	-	-	available at CAAQM stations (2 Nos.- at Cuddalore)
21	Dry Gas Meter	Yes	-	-	
22	Diesel Exhaust analyzer	No	6	-	
23	Exhaust CO/HC analyzer with Sampling Probe	No	6	-	
24	Automated Noise Monitoring System	No	6	-	
25	Integrating Sound level meter	Yes	-	-	
26	Continuous PM ₁₀ & PM _{2.5} Monitoring Analyzer TEOM system	Yes	-	-	available at CAAQM stations (2 Nos.- at Cuddalore), CAAQM station operates based on Beta ray attenuation
27	Top loading orifice kit for calibration of HVS	Yes	-	-	
28	Permeation tubes (SO ₂ , NO-NO ₂ -NO _x , NH ₃ , BTX)	No	6	-	
C. List of Equipment required for processing of Environmental Samples:					
a) Mandatory Requirements					
1	Accelerated Solvent Extraction (ASE) System	No	6	-	
2	Ammonia distillation assembly/TKN Analyzer	Yes	-	-	
3	Analytical Balance 4/5 digit & 6 digit (Digital)	Yes	-	-	
4	Aquarium for Toxicity bioassay test with complete accessories (*4 Nos)	No	6	-	

5	Autoclave (*2 Nos)	Yes	-	-	1 No.available
6	Bacteriological Incubators Stainless steel (*2 Nos)	Yes	-	-	
7	Bio safety cabinets	Yes	-	-	
8	BOD Incubators (2 nos.)	Yes	-	-	1 No.available
9	Centrifuge	No	6	-	
10	COD Digestion heated Blocks (2) with capacity 16 nos. or more	Yes	-	-	1 No.available
11	Cyanide Distillation Assembly (3)	Yes	-	-	1 No.available
12	Deep Freezer- Capacity 500 litre	Yes	-	-	180 ltr available
13	Laboratory Ball Mill Grinder	No	6	-	
14	Laboratory Grinder	No	6	-	
15	Laminar Flow bench for Microbiological analysis	Yes	-	-	
16	Magnetic Stirrer with heating system (*2 Nos)	Yes	-	-	
17	Mechanical Shaker	No	6	-	
18	Membrane Filtration assembly with vacuum pump (2 nos.)	No	6	-	
19	Microbial culture refrigerator	Yes	-	-	
20	Microwave Digester with 16 vessels/ Hot Plate	Yes	-	-	Hot plate available
21	Muffle Furnace (*1 Nos), Range 1200 C	Yes	-	-	
22	Phenol distillation assembly (3)	Yes	-	-	1 No.available
23	Plate counter, Manual/Automatic	No	6	-	
24	Digestion Chambers/ Fume hood	Yes	-	-	
25	Digital Thermometer & Humidity meter- All lab area	Yes	-	-	
26	Dispensers (Various capacities) up to 5, 10, 25 & 50 ml	Yes	-	-	
27	Filtration Assembly with vacuum pump	No	6	-	
28	Fluoride Distillation Assembly (3)	Yes	-	-	1 No.available

29	Arsenic / Fluoride Glass Distillation assemblies	Yes	-	-	
30	Glass Double Distillation Assembly /Water Purification System	Yes	-	-	Water Purification system available
31	Heating mantles (2 nos.)	Yes	-	-	
32	Hot plates (small, Medium and Large) (*2 nos.)	Yes	-	-	1 No.available
33	Thermo Hygrometer	Yes	-	-	
34	Imhoff Cone	No	6	-	
35	Top loading Precision Digital Balance (minimum detection 0.001mg/0.01 mg) with anti-vibration facility- 3 nos. i.e 4/5 Digit (2 nos), - 6 Digit (1 no)	Yes	-	-	
36	Refrigerators Big Size 300 litres or more, double door- 2 nos.	Yes	-	-	1 No.available
37	Rotary Evaporator (Buchi type) with water recirculating chiller	No	6	-	
38	Separating funnel shaker	No	6	-	
39	Soxhlet Apparatus	Yes	-	-	
40	Solid Phase Extraction (SPE) /SPME Extraction system	No	6	-	
41	Thermometer (Alcohol)	No	6	-	
42	Dry & wet bulb Thermometer	Yes	-	-	
43	Toxicity characteristic leaching procedure (TCLP) Extractors (Zero head and Bottle)	No	6	-	
44	Ultra sonic water bath- Capacity 3 litre	No	6	-	
45	Water Bath with temperature control (*2 Nos)	No	6	-	
46	Water Bath with temp. for mercury sample digestion- 20 BOD Bottles	No	6	-	
D. Analytical Instruments at Environmental Laboratories					
a) Mandatory Requirements					

1	Atomic Absorption spectrometer (AAS)- Flame, Hydride & Graphite Tube Atomizer (GTA)	Yes	-	-	
2	Binocular Stereo Zoom Microscope	No	6	-	
3	Bomb Calorimeter	No	6	-	
4	BTX Analyzer with BTX calibrator	No	6	-	
5	Colony counter	No	6	-	
6	Conductivity meter- 2 nos.	Yes	-	-	1 No.available
7	Environment conditioning chamber	yes	-	-	
8	Digital Burettes- 50 ml*2, 100 ml*2	No	6	-	
9	Dissolved Oxygen Meter (Bench model)	Yes	-	-	
10	Flame Photometer	Yes	-	-	
11	Flash Point Apparatus	No	6	-	
12	Gas Chromatograph Mass Spectrometer	No	6	-	
13	High Performance Liquid Chromatograph (HPLC)	No	6	-	
14	Inductively Coupled Plasma (ICP) Spectrometer-OES	No	6	-	
15	Ion Chromatograph Anion & Cations	No	6	-	
16	Methane and Non Methane (NMHC) Analyzer	No	6	-	
17	Microscope – 100x	No	6	-	
18	Microscope Binocular Research	No	6	-	
19	CO (NDIR based) Analyzer	Yes	-	-	
20	Nephelometer (Turbidity Meter)	Yes	-	-	
21	pH-Meter with combined electrode (3 point)- 2 nos.	Yes	-	-	
22	Specific ion Analyzer with ion selective electrodes	No	6	-	
23	Spectrophotometer Visible (Portable)	Yes	-	-	

24	TKN Analyzer semi-automatic with aluminum block digester	Yes	-	-	
25	UV-Vis Spectrophotometer	Yes	-	-	
26	Moisture Content Analyzer	No	6	-	
b) Optional Requirements					
1	Automatic Titration Assembly	No	6	-	
2	Carbon, Hydrogen, Nitrogen and Sulphur (CHNS) Elemental Analyzer	No	6	-	
3	EDXRF Analyzer/WDXRF Analyzer	No	6	-	
4	Fourier-transform infrared Spectrometer (FTIR)	No	6	-	
5	Flocculator (Jar testing apparatus)	No	6	-	
6	Toxic Gas Analyzer	No	6	-	
7	Organic Halogen (AOX/TOX) Analyzer	No	6	-	
8	TOC Analyzer	No	6	-	
9	High Resolution Mass Spectrometer (HRGC-HRMS)	No	6	-	
10	Inductively Coupled Plasma Mass (ICP-MS) Spectrometer	No	6	-	
11	X Ray Fluorescence (XRF) Spectrometer (Portable)	No	6	-	
Specific remarks, if any:					

Note: It is requested to please ensure that each sheet is created separately for each laboratory and rename the sheet accordingly . For e.g. Central Laboratory, Regional Laboratory etc

LABORATORY ANALYTICAL FACILITIES

Name of the Board / Committee: Tamil Nadu Pollution Control Board - Advanced Environmental Laboratory, Madurai

PART I: Facility available for monitoring of environmental parameters:

S. No.	Parameters	Facilities Available (Yes / No)	If facility is not available, Specify Timeline for addition of this parameter. (in months)	Action Taken for addition of this parameter (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. Sample Matrix / Group of Water and Wastewater					
(a) Physical Tests					
1	Temperature	Yes	-	-	
2	Colour	Yes	-	-	
3	pH	Yes	-	-	
4	Turbidity	Yes	-	-	
5	Conductivity	Yes	-	-	
6	Total Solids	Yes	-	-	
7	Total Dissolved Solids (TDS)	Yes	-	-	
8	Total Suspended Solids (TSS)	Yes	-	-	
(b) Inorganic Tests					
(i) General & Non-metallic					
1	Alkalinity	Yes	-	-	
2	Chloride	Yes	-	-	
3	Cyanide	Yes	-	-	
4	Dissolved oxygen	Yes	-	-	

5	Nitrite nitrogen	Yes	-	-	
6	Nitrate nitrogen	Yes	-	-	
7	Ammonical nitrogen	Yes	-	-	
8	Fluoride	Yes	-	-	
9	Hardness (Total)	Yes	-	-	
10	Calcium	Yes	-	-	
11	Magnesium	Yes	-	-	
12	Phosphate	Yes	-	-	
13	Sulphate	Yes	-	-	
14	Sulphide	Yes	-	-	
15	Total Residual chlorine (TRC)	Yes	-	-	
1	Aluminium (Al)	No	6		
2	Arsenic (As) Total	Yes	-	-	
3	Barium	No	6		
4	Boron	Yes	-	-	
5	Chromium (Cr) Hexavalent	Yes	-	-	
6	Chromium (Cr) Total	Yes	-	-	
7	Cadmium (Cd)	Yes	-	-	
8	Cobalt (Co)	Yes	-	-	
9	Copper (Cu)	Yes	-	-	
10	Iron (Fe)	Yes	-	-	
11	Lead (Pb)	Yes	-	-	
12	Manganese (Mn)	Yes	-	-	
13	Mercury (Hg)	Yes	-	-	
14	Nickel (Ni)	Yes	-	-	
15	Potassium (K)	Yes	-	-	
16	Sodium (Na)	Yes	-	-	
17	Vanadium (V)	No	6	-	

18	Zinc (Zn)	Yes	-	-	
19	Selenium (Se)	No	6	-	
(c) Organics (General) and Trace Organics Tests					
1	Biological Oxygen Demand (BOD)	Yes	-	-	
2	Chemical oxygen demand (COD)	Yes	-	-	
3	Oil & Grease	Yes	-	-	
4	Phenolic Compounds as C ₆ H ₅ OH	Yes	-	-	
5	Benzopyrene	No	6	-	
6	Pesticides				
6.a	Organochlorine Pesticides (OCPs) Tests				
i	Aldrin	No	6	-	
ii	Alpha Endosulphan	No	6	-	
iii	p,p'-DDT	No	6	-	
iv	Alpha-HCH	No	6	-	
v	Beta HCH	No	6	-	
vi	Beta Endosulphan	No	6	-	
vii	Gama-HCH	No	6	-	
viii	o,p'-DDT	No	6	-	
ix	p,p'-DDE	No	6	-	
6.b	Organophosphorus Pesticides (OPPs) Tests				
i	Malathion	No	6	-	
ii	Methyl parathion	No	6	-	
iii	Chlorpyriphos	No	6	-	
iv	Dimethoate	No	6	-	
v	Dieldrin	No	6	-	
vi	Ethion	No	6	-	
(d) Microbiological Tests					
1	Total Coliform	Yes	-	-	
2	Faecal Coliform	Yes	-	-	
3	E. Coli	Yes	-	-	
4	Faecal Streptococci	Yes	-	-	

(e) Toxicological Tests					
1	Bioassay method for evaluation of toxicity using fish (90% survival of fish after 96 hrs in 100% effluent)	No	6	-	
B. Sample Matrix / Group of Solid / Solid Waste					
(a) Soil / Sediment /Compost Tests					Facility available for Solid and sediment Tests
1	Cation Exchange Capacity (CEC)	Yes	-	-	
2	Electrical Conductivity (EC)	Yes	-	-	
3	Organic carbon (Chemical Method)	Yes	-	-	
4	pH	Yes	-	-	
5	Soil moisture	Yes	-	-	
6	Total nitrogen	Yes	-	-	
7	Metals by digestion (As, Cd, Cr, Pb, Ni etc.)	Yes	-	-	except AS
(b) Hazardous Waste (Liquid / Slurry / Sludge / Solid / Semi-Solid) Tests					
1	Corrosivity	No	6	-	
2	Ignitability (Flash Point)	No	6	-	
3	Loss on Drying at 1050C (% Moisture Content)	No	6	-	
4	Loss on Drying at 5500C (% Organic Content)	No	6	-	
5	pH	No	6	-	
6	Organic carbon/matter (Chemical Method)	No	6	-	
7	Calorific Value	No	6	-	
8	Toxicity Characteristics leaching procedure (TCLP) Leachate and Metals in Leachate (As,Cd,Cr, Pb, Ni)	No	6	-	
C. Sample Matrix / Group of Analytes: Air					
(a) Ambient Air					
1	Nitrogen dioxide as NO2	Yes	-	-	
2	Sulphur dioxide (SO2)	Yes	-	-	
3	Particulate matter (PM10)	Yes	-	-	

4	Particulate matter (PM2.5)	Yes	-	-	
5	Carbon Monoxide	No	6	-	
6	Ozone	Yes	-	-	
7	Benzene	No	6	-	
8	Ammonia	Yes	-	-	
9	Metals in Particulate Matter, Pb	Yes	-	-	
10	Metals in Particulate Matter, As	Yes	-	-	
11	Metals in Particulate Matter, Ni	Yes	-	-	
12	Particulate Benzo-a-Pyrene (BaP)	No	6	-	
(b) Stack Gas / Stationary Source Emission					
1	Particulate Matter	Yes	-	-	
2	Sulphur Dioxide	Yes	-	-	
3	Carbon Dioxide	Yes	-	-	
4	Carbon Monoxide (NDIR based Method)	Yes	-	-	
5	Temperature	Yes	-	-	
6	Moisture	Yes	-	-	
7	Oxygen	Yes	-	-	
8	Oxides of Nitrogen	Yes	-	-	
9	Halides (HCL/HF)	Yes	-	-	
(c) Noise Level					
1	Ambient Noise level measurement (20 to 140 dB)	Yes	-	-	
2	Source Noise Level Measurement (Industrial process, DG set- 20 to 140dB)	Yes	-	-	
(d) Meteorological Monitoring					
1	Ambient Temperature	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
2	Wind direction	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
3	Wind speed	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station

4	Relative Humidity	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
5	Mixing Height	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
			-	-	
Specific remarks, if any:					
PART II: Details of Laboratory Infrastructure (Instruments and Equipment)					
S. No.	Name of Instrument / Equipments	Available Yes / No	If the Instrument / Equipment is not available, Specify Timeline for procurement of this instrument (in months)	Action Taken for procurement of this Instrument / Equipment (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. List of Instruments / Equipment for Sampling of Water, Wastewater and Soil / Hazardous Wastes					
a) Mandatory Requirements					
1	Portable / Pen type pH meter / pH strip	Yes	-	-	
2	Portable Dissolved Oxygen Meter / Field Fixing using chemicals	Yes	-	-	
3	Electrical Conductivity meter pen type	No	6	procurement initiated	
4	Flow meter / Physical flow measuring	No	6	-	
5	GPS / Mobile with GPS app	No	6	-	
6	Ice Box (2 nos.) (150 litre & 100 litre capacities)	Yes	-	-	
7	Thermometer	Yes	-	-	
8	Stainless steel bucket with nylon rope and mug	Yes	-	-	
9	Ground water level measuring device	No	6	-	
10	Scoop / shovel	Yes	-	-	

11	Auger / core sampler	No	6	-	
b) Optional Requirements					
1	Bottom Sampler / Depth sampler	No	6	-	
2	Chloroscope for residual chlorine	No	6	-	
3	Vandom or equivalent water sampler (Automatic sampler when composite sampling to be done)	No	6	-	
4	Ekman Dredge	No	6	-	
B. List of Instruments / Equipment for Sampling of Ambient Air and Source Emission monitoring					
a) Mandatory Requirements					
1	Fine dust samplers PM2.5 (*4 Nos)	Yes	-	-	
2	Respirable Dust Sampler PM 10 (* 4 Nos)	Yes	-	-	
3	High Volume Sampler (SPM) (4 Nos)	Yes	-	-	
4	Handy Sampler with set of glass impingers (*2 Nos)	No	6	-	
5	Low Volume Sampler (LVS)	No	6	-	
6	Tedler bags different sizes	No	6	-	
7	Meteorological tower (All in one telescopic Mast) with sensors comprising wind speed, wind direction, ambient temp., Relative humidity, Solar radiation, rainfall etc.	Yes	-	procurement initiated	available at CAAQM stations (3 Nos.-1no. at Madurai, 1 no. at Virudhunagar and 1 No. at Ramanathapuram)
8	Nitrogen Cylinder portable	No	6	-	
9	Activated Charcoal tubes/ Tenex	No	6	-	
10	Barometer (Digital)	No	6	-	
11	Isokinetic Stack Monitoring Kit complete with Stack monitoring instrument panel with inclined cum vertical manometer, Cold Box, Vacuum pump, Glass assembly impingers	Yes	-	-	
12	Modified S type Stainless steel Pitot tube (Standard length) with Assembly	Yes	-	-	

13	Monoblock type, rotary design vacuum pump	Yes	-	-	
14	Orsat Apparatus	Yes	-	-	
15	Source emission monitoring Impingers train set with spare impingers 100 ml & 225 ml capacity	Yes	-	-	
16	Stainless steel heated Sampling Probes with thimble holders short and long	Yes	-	-	
17	Flue Gas analyzer	Yes	-	-	
18	Thermometer/ Thermocouple	Yes	-	-	
19	Calibrator for Noise Meters	Yes	-	-	
20	Digital Sound level (Noise) Metres	Yes	-	-	
21	Portable TOC Analyzer for emission monitoring.	No	6	-	
22	Polyurethane Foam PUF Sampler	No	6	-	
b) Optional Requirements					
1	Anemometer	Yes	-	-	available at CAAQM stations (3 Nos.-1no. at Madurai, 1 no. at Virudhunagar and 1 No. at Ramanathapuram)
2	Weather Monitoring system	Yes	-	-	available at CAAQM stations (3 Nos.-1no. at Madurai, 1 no. at Virudhunagar and 1 No. at Ramanathapuram)
3	Wind speed/wind direction monitor	Yes	-	-	available at CAAQM stations (3 Nos.-1no. at Madurai, 1 no. at Virudhunagar and 1 No. at Ramanathapuram)
4	Continuous Ambient Air Monitoring System, Fixed	Yes	-	-	available at CAAQM stations (3 Nos.-1no. at Madurai, 1 no. at Virudhunagar and 1 No. at Ramanathapuram)
5	Continuous PM10 Analyzer	Yes	-	-	available at CAAQM stations (3 Nos.-1no. at Madurai, 1 no. at Virudhunagar and 1 No. at Ramanathapuram)
6	Continuous Ambient Air Monitoring System, Mobile	No	6	-	
7	Continuous PM2.5 analyzer	Yes	-	-	available at CAAQM stations (3 Nos.-1no. at Madurai, 1 no. at Virudhunagar and 1 No. at Ramanathapuram)
8	Ambient Nitrogen Oxides (NO-NO2-NOx Analyzer	Yes	-	-	including Ammonia Analyser ,available at CAAQM stations (3 Nos.-1no. at Madurai, 1 no. at Virudhunagar and 1 No. at Ramanathapuram),
9	Ambient Ozone Analyzer	Yes	-	-	available at CAAQM stations (3 Nos.-1no. at Madurai, 1 no. at Virudhunagar and 1 No. at Ramanathapuram)

10	Ambient BTEX Analyzer	Yes	-	-	available at CAAQM stations (3 Nos.-1no. at Madurai, 1 no. at Virudhunagar and 1 No. at Ramanathapuram)
11	Multipoint Gas Calibration system	Yes	-	-	available at CAAQM stations (3 Nos.-1no. at Madurai, 1 no. at Virudhunagar and 1 No. at Ramanathapuram)
12	Ambient Sulphur Dioxide analyzer	Yes	-	-	available at CAAQM stations (3 Nos.-1no. at Madurai, 1 no. at Virudhunagar and 1 No. at Ramanathapuram)
13	Ambient Carbon Monoxide & Carbon dioxide analyzer	Yes	-	-	available at CAAQM stations (3 Nos.-1no. at Madurai, 1 no. at Virudhunagar and 1 No. at Ramanathapuram)
14	Total Hydrocarbon analyzer	No	6	-	
15	Ambient Ammonia analyzer	No	6	-	
16	Zero Gas Generator	Yes	-	-	available at CAAQM stations (3 Nos.-1no. at Madurai, 1 no. at Virudhunagar and 1 No. at Ramanathapuram)
17	Synthetic Air Cylinder	No	6	-	
18	Calibration Gas Cylinders, SO ₂ , NO, CO, NH ₃ , benzene and Toluene One each with stainless steel Regulators	Yes	-	-	available at CAAQM stations (3 Nos.-1no. at Madurai, 1 no. at Virudhunagar and 1 No. at Ramanathapuram)
19	Continuous emission monitoring equipment	No	6	-	
20	19 inch Rack mounting system for air analyzers	Yes	-	-	available at CAAQM stations (3 Nos.-1no. at Madurai, 1 no. at Virudhunagar and 1 No. at Ramanathapuram)
21	Dry Gas Meter	Yes	-	-	
22	Diesel Exhaust analyzer	No	6	-	
23	Exhaust CO/HC analyzer with Sampling Probe	No	6	-	
24	Automated Noise Monitoring System	No	6	-	
25	Integrating Sound level meter	Yes	-	-	
26	Continuous PM ₁₀ & PM _{2.5} Monitoring Analyzer TEOM system	Yes	-	-	available at CAAQM stations (3 Nos.-1no. at Madurai, 1 no. at Virudhunagar and 1 No. at Ramanathapuram),CAAQM station operates based on Beta ray attenuation
27	Top loading orifice kit for calibration of HVS	Yes	-	-	
28	Permeation tubes (SO ₂ , NO-NO ₂ -NO _x ,NH ₃ , BTX)	No	6	-	
C. List of Equipment required for processing of Environmental Samples:					

a) Mandatory Requirements					
1	Accelerated Solvent Extraction (ASE) System	No	6	-	
2	Ammonia distillation assembly/TKN Analyzer	Yes	-	-	
3	Analytical Balance 4/5 digit & 6 digit (Digital)	Yes	-	-	
4	Aquarium for Toxicity bioassay test with complete accessories (*4 Nos)	No	6	-	
5	Autoclave (*2 Nos)	Yes	-	-	1 No.available
6	Bacteriological Incubators Stainless steel (*2 Nos)	Yes	-	-	
7	Bio safety cabinets	Yes	-	-	
8	BOD Incubators (2 nos.)	Yes			1 No.available
9	Centrifuge	No	6	-	
10	COD Digestion heated Blocks (2) with capacity 16 nos. or more	Yes	-	-	1 No.available
11	Cyanide Distillation Assembly (3)	Yes	-	-	1 No.available
12	Deep Freezer- Capacity 500 litre	Yes	-	-	180 lr available
13	Laboratory Ball Mill Grinder	No	6	-	
14	Laboratory Grinder	No	6	-	
15	Laminar Flow bench for Microbiological analysis	Yes	-	-	
16	Magnetic Stirrer with heating system (*2 Nos)	Yes	-	-	
17	Mechanical Shaker	No	6	-	
18	Membrane Filtration assembly with vacuum pump (2 nos.)	No	6	-	
19	Microbial culture refrigerator	Yes	6	-	
20	Microwave Digester with 16 vessels/ Hot Plate	Yes	-	-	Hot plate available
21	Muffle Furnace (*1 Nos), Range 1200 C	Yes	-	-	

22	Phenol distillation assembly (3)	Yes	-	-	1 No.available
23	Plate counter, Manual/Automatic	No	6	-	
24	Digestion Chambers/ Fume hood	Yes	-	-	
25	Digital Thermometer & Humidity meter- All lab area	Yes	-	-	
26	Dispensers (Various capacities) up to 5, 10, 25 & 50 ml	Yes	-	-	
27	Filtration Assembly with vacuum pump	No	6	-	
28	Fluoride Distillation Assembly (3)	Yes			1 No.available
29	Arsenic / Fluoride Glass Distillation assemblies	Yes	-	-	
30	Glass Double Distillation Assembly /Water Purification System	Yes	-	-	water purification system available
31	Heating mantles (2 nos.)	Yes	-	-	
32	Hot plates (small, Medium and Large) (*2 nos.)	Yes	-	-	1 No.available
33	Thermo Hygrometer	Yes	-	-	
34	Imhoff Cone	No	6	-	
35	Top loading Precision Digital Balance (minimum detection 0.001mg/0.01 mg) with anti-vibration facility- 3 nos. i.e 4/5 Digit (2 nos), - 6 Digit (1 no)	Yes	-	-	
36	Refrigerators Big Size 300 litres or more, double door- 2 nos.	Yes	-	-	1 No.available
37	Rotary Evaporator (Buchi type) with water recirculating chiller	No	6	-	
38	Separating funnel shaker	No	6	-	
39	Soxhlet Apparatus	Yes	-	-	
40	Solid Phase Extraction (SPE) /SPME Extraction system	No	6	-	
41	Thermometer (Alcohol)	No	6	-	
42	Dry & wet bulb Thermometer	Yes	-	-	

43	Toxicity characteristic leaching procedure (TCLP) Extractors (Zero head and Bottle)	No	6	-	
44	Ultra sonic water bath- Capacity 3 litre	No	6	-	
45	Water Bath with temperature control (*2 Nos)	No	6	-	
46	Water Bath with temp. for mercury sample digestion- 20 BOD Bottles	No	6	-	
D. Analytical Instruments at Environmental Laboratories					
a) Mandatory Requirements					
1	Atomic Absorption spectrometer (AAS)- Flame, Hydride & Graphite Tube Atomizer (GTA)	Yes	-	-	
2	Binocular Stereo Zoom Microscope	No	6	-	
3	Bomb Calorimeter	No	6	-	
4	BTX Analyzer with BTX calibrator	No	6	-	
5	Colony counter	No	6	-	
6	Conductivity meter- 2 nos.	Yes	-	-	1 No.available
7	Environment conditioning chamber	Yes	-	-	
8	Digital Burettes- 50 ml*2, 100 ml*2	No	6	-	
9	Dissolved Oxygen Meter (Bench model)	Yes	-	-	
10	Flame Photometer	Yes	-	-	
11	Flash Point Apparatus	No	6	-	
12	Gas Chromatograph Mass Spectrometer	No	6	-	
13	High Performance Liquid Chromatograph (HPLC)	No	6	-	
14	Inductively Coupled Plasma (ICP) Spectrometer-OES	No	6	-	
15	Ion Chromatograph Anion & Cations	No	6	-	
16	Methane and Non Methane (NMHC) Analyzer	No	6	-	

17	Microscope – 100x	No	6	-	
18	Microscope Binocular Research	No	6	-	
19	CO (NDIR based) Analyzer	Yes	-	-	
20	Nephelometer (Turbidity Meter)	Yes	-	-	
21	pH-Meter with combined electrode (3 point)- 2 nos.	Yes	-	-	
22	Specific ion Analyzer with ion selective electrodes	No	6	-	
23	Spectrophotometer Visible (Portable)	Yes	-	-	
24	TKN Analyzer semi-automatic with aluminum block digester	Yes	-	-	
25	UV-Vis Spectrophotometer	Yes	-	-	
26	Moisture Content Analyzer	No	6	-	
b) Optional Requirements					
1	Automatic Titration Assembly	No	6	-	
2	Carbon, Hydrogen, Nitrogen and Sulphur (CHNS) Elemental Analyzer	No	6	-	
3	EDXRF Analyzer/WDXRF Analyzer	No	6	-	
4	Fourier-transform infrared Spectrometer (FTIR)	No	6	-	
5	Flocculator (Jar testing apparatus)	No	6	-	
6	Toxic Gas Analyzer	No	6	-	
7	Organic Halogen (AOX/TOX) Analyzer	No	6	-	
8	TOC Analyzer	No	6	-	
9	High Resolution Mass Spectrometer (HRGC-HRMS)	No	6	-	
10	Inductively Coupled Plasma Mass (ICP-MS) Spectrometer	No	6	-	
11	X Ray Fluorescence (XRF) Spectrometer (Portable)	No	6	-	

Specific remarks, if any:					

Note: It is requested to please ensure that each sheet is created separately for each laboratory and rename the sheet accordingly . For e.g. Central Laboratory, Regional Laboratory etc

LABORATORY ANALYTICAL FACILITIES

Name of the Board / Committee: Tamil Nadu Pollution Control Board - Advanced Environmental Laboratory,Salem

PART I: Facility available for monitoring of environmental parameters:

S. No.	Parameters	Facilities Available (Yes / No)	If facility is not available, Specify Timeline for addition of this parameter. (in months)	Action Taken for addition of this parameter (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. Sample Matrix / Group of Water and Wastewater					
(a) Physical Tests					
1	Temperature	Yes	-	-	
2	Colour	Yes	-	-	
3	pH	Yes	-	-	
4	Turbidity	Yes	-	-	
5	Conductivity	Yes	-	-	
6	Total Solids	Yes	-	-	
7	Total Dissolved Solids (TDS)	Yes	-	-	
8	Total Suspended Solids (TSS)	Yes	-	-	
(b) Inorganic Tests					
(i) General & Non-metallic					
1	Alkalinity	Yes	-	-	
2	Chloride	Yes	-	-	
3	Cyanide	Yes	-	-	
4	Dissolved oxygen	Yes	-	-	

5	Nitrite nitrogen	Yes	-	-	
6	Nitrate nitrogen	Yes	-	-	
7	Ammonical nitrogen	Yes	-	-	
8	Fluoride	Yes	-	-	
9	Hardness (Total)	Yes	-	-	
10	Calcium	Yes	-	-	
11	Magnesium	Yes	-	-	
12	Phosphate	Yes	-	-	
13	Sulphate	Yes	-	-	
14	Sulphide	Yes	-	-	
15	Total Residual chlorine (TRC)	Yes	-	-	
1	Aluminium (Al)	No	6	-	
2	Arsenic (As) Total	Yes	-	-	
3	Barium	No	6	-	
4	Boron	Yes	-	-	
5	Chromium (Cr) Hexavalent	Yes	-	-	
6	Chromium (Cr) Total	Yes	-	-	
7	Cadmium (Cd)	Yes	-	-	
8	Cobalt (Co)	Yes	-	-	
9	Copper (Cu)	Yes	-	-	
10	Iron (Fe)	Yes	-	-	
11	Lead (Pb)	Yes	-	-	
12	Manganese (Mn)	Yes	-	-	
13	Mercury (Hg)	Yes	-	-	
14	Nickel (Ni)	Yes	-	-	
15	Potassium (K)	Yes	-	-	
16	Sodium (Na)	Yes	-	-	
17	Vanadium (V)	No	6	-	

18	Zinc (Zn)	Yes	-	-
19	Selenium (Se)	No	6	-
(c) Organics (General) and Trace Organics Tests				
1	Biological Oxygen Demand (BOD)	Yes	-	-
2	Chemical oxygen demand (COD)	Yes	-	-
3	Oil & Grease	Yes	-	-
4	Phenolic Compounds as C ₆ H ₅ OH	Yes	-	-
5	Benzopyrene	No	6	-
6	Pesticides			
6.a	Organochlorine Pesticides (OCPs) Tests			
i	Aldrin	No	6	-
ii	Alpha Endosulphan	No	6	-
iii	p,p'-DDT	No	6	-
iv	Alpha-HCH	No	6	-
v	Beta HCH	No	6	-
vi	Beta Endosulphan	No	6	-
vii	Gama-HCH	No	6	-
viii	o,p'-DDT	No	6	-
ix	p,p'-DDE	No	6	-
6.b	Organophosphorus Pesticides (OPPs) Tests			
i	Malathion	No	6	-
ii	Methyl parathion	No	6	-
iii	Chlorpyrifos	No	6	-
iv	Dimethoate	No	6	-
v	Dieldrin	No	6	-
vi	Ethion	No	6	-
(d) Microbiological Tests				
1	Total Coliform	Yes	-	-
2	Faecal Coliform	Yes	-	-
3	E. Coli	Yes	-	-
4	Faecal Streptococci	Yes	-	-

(e) Toxicological Tests					
1	Bioassay method for evaluation of toxicity using fish (90% survival of fish after 96 hrs in 100% effluent)	No	6	-	
B. Sample Matrix / Group of Solid / Solid Waste					
(a) Soil / Sediment /Compost Tests					Facility available for Solid and sediment Tests
1	Cation Exchange Capacity (CEC)	Yes	-	-	
2	Electrical Conductivity (EC)	Yes	-	-	
3	Organic carbon (Chemical Method)	Yes	-	-	
4	pH	Yes	-	-	
5	Soil moisture	Yes	-	-	
6	Total nitrogen	Yes	-	-	
7	Metals by digestion (As, Cd, Cr, Pb, Ni etc.)	Yes	-	-	except As
(b) Hazardous Waste (Liquid / Slurry / Sludge / Solid / Semi-Solid) Tests					
1	Corrosivity	No	6	-	
2	Ignitability (Flash Point)	No	6	-	
3	Loss on Drying at 1050C (% Moisture Content)	No	6	-	
4	Loss on Drying at 5500C (% Organic Content)	No	6	-	
5	pH	No	6	-	
6	Organic carbon/matter (Chemical Method)	No	6	-	
7	Calorific Value	No	6	-	
8	Toxicity Characteristics leaching procedure (TCLP) Leachate and Metals in Leachate (As,Cd,Cr, Pb, Ni)	No	6	-	
C. Sample Matrix / Group of Analytes: Air					
(a) Ambient Air					
1	Nitrogen dioxide as NO2	Yes	-	-	
2	Sulphur dioxide (SO2)	Yes	-	-	
3	Particulate matter (PM10)	Yes	-	-	

4	Particulate matter (PM2.5)	Yes	-	-	
5	Carbon Monoxide	No	6	-	
6	Ozone	Yes	-	-	
7	Benzene	No	6	-	
8	Ammonia	Yes	-	-	
9	Metals in Particulate Matter, Pb	Yes	-	-	
10	Metals in Particulate Matter, As	Yes	-	-	
11	Metals in Particulate Matter, Ni	Yes	-	-	
12	Particulate Benzo-a-Pyrene (BaP)	No	6	-	
(b) Stack Gas / Stationary Source Emission					
1	Particulate Matter	Yes	-	-	
2	Sulphur Dioxide	Yes	-	-	
3	Carbon Dioxide	Yes	-	-	
4	Carbon Monoxide (NDIR based Method)	Yes	-	-	
5	Temperature	Yes	-	-	
6	Moisture	Yes	-	-	
7	Oxygen	Yes	-	-	
8	Oxides of Nitrogen	Yes	-	-	
9	Halides (HCL/HF)	Yes	-	-	
(c) Noise Level					
1	Ambient Noise level measurement (20 to 140 dB)	Yes	-	-	
2	Source Noise Level Measurement (Industrial process, DG set- 20 to 140dB)	Yes	-	-	
(d) Meteorological Monitoring					
1	Ambient Temperature	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
2	Wind direction	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
3	Wind speed	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station

4	Relative Humidity	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
5	Mixing Height	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station

Specific remarks, if any:

PART II: Details of Laboratory Infrastructure (Instruments and Equipment)

S. No.	Name of Instrument / Equipments	Available Yes / No	If the Instrument / Equipment is not available, Specify Timeline for procurement of this instrument (in months)	Action Taken for procurement of this Instrument / Equipment (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. List of Instruments / Equipment for Sampling of Water, Wastewater and Soil / Hazardous Wastes					
a) Mandatory Requirements					
1	Portable / Pen type pH meter / pH strip	Yes	-	-	
2	Portable Dissolved Oxygen Meter / Field Fixing using chemicals	Yes	-	-	
3	Electrical Conductivity meter pen type	No	6	procurement initiated	
4	Flow meter / Physical flow measuring	No	6	-	
5	GPS / Mobile with GPS app	No	6	-	
6	Ice Box (2 nos.) (150 litre & 100 litre capacities)	Yes	-	-	
7	Thermometer	Yes	-	-	
8	Stainless steel bucket with nylon rope and mug	Yes	-	-	
9	Ground water level measuring device	No	6	-	
10	Scoop / shovel	Yes	-	-	

11	Auger / core sampler	No	6	-	
b) Optional Requirements					
1	Bottom Sampler / Depth sampler	Yes	-	-	
2	Chloroscope for residual chlorine	No	6	-	
3	Vandorn or equivalent water sampler (Automatic sampler when composite sampling to be done)	No	6	-	
4	Ekman Dredge	No	6	-	
B. List of Instruments / Equipment for Sampling of Ambient Air and Source Emission monitoring					
a) Mandatory Requirements					
1	Fine dust samplers PM2.5 (*4 Nos)	Yes	-	-	
2	Respirable Dust Sampler PM 10 (* 4 Nos)	Yes	-	-	
3	High Volume Sampler (SPM) (4 Nos)	Yes	-	-	
4	Handy Sampler with set of glass impingers (*2 Nos)	No	6	-	
5	Low Volume Sampler (LVS)	No	6	-	
6	Tedler bags different sizes	No	6	-	
7	Meteorological tower (All in one telescopic Mast) with sensors comprising wind speed, wind direction, ambient temp., Relative humidity, Solar radiation, rainfall etc.	Yes	-	procurement initiated	available at CAAQM stations (2 Nos.-1no. at Salem and 1 no. at Namakkal)
8	Nitrogen Cylinder portable	No	6	-	
9	Activated Charcoal tubes/ Tenex	No	6	-	
10	Barometer (Digital)	No	6	-	
11	Isokinetic Stack Monitoring Kit complete with Stack monitoring instrument panel with inclined cum vertical manometer, Cold Box, Vacuum pump, Glass assembly impingers	Yes	-	-	
12	Modified S type Stainless steel Pitot tube (Standard length) with Assembly	Yes	-	-	

13	Monoblock type, rotary design vacuum pump	Yes	-	-	
14	Orsat Apparatus	Yes	-	-	
15	Source emission monitoring Impingers train set with spare impingers 100 ml & 225 ml capacity	Yes	-	-	
16	Stainless steel heated Sampling Probes with thimble holders short and long	Yes	-	-	
17	Flue Gas analyzer	Yes	-	-	
18	Thermometer/ Thermocouple	Yes	-	-	
19	Calibrator for Noise Meters	Yes	-	-	
20	Digital Sound level (Noise) Metres	Yes	-	-	
21	Portable TOC Analyzer for emission monitoring.	No	6	-	
22	Polyurethane Foam PUF Sampler	No	6	-	
b) Optional Requirements					
1	Anemometer	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Salem and 1 no. at Namakkal)
2	Weather Monitoring system	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Salem and 1 no. at Namakkal)
3	Wind speed/wind direction monitor	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Salem and 1 no. at Namakkal)
4	Continuous Ambient Air Monitoring System, Fixed	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Salem and 1 no. at Namakkal)
5	Continuous PM10 Analyzer	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Salem and 1 no. at Namakkal)
6	Continuous Ambient Air Monitoring System, Mobile	No	6	-	
7	Continuous PM2.5 analyzer	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Salem and 1 no. at Namakkal)
8	Ambient Nitrogen Oxides (NO-NO2-NOx Analyzer	Yes	-	-	including Ammonia Analyser , available at CAAQM stations (2 Nos.-1no. at Salem and 1 no. at Namakkal)
9	Ambient Ozone Analyzer	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Salem and 1 no. at Namakkal)
10	Ambient BTEX Analyzer	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Salem and 1 no. at Namakkal)

11	Multipoint Gas Calibration system	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Salem and 1 no. at Namakkal)
12	Ambient Sulphur Dioxide analyzer	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Salem and 1 no. at Namakkal)
13	Ambient Carbon Monoxide & Carbon dioxide analyzer	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Salem and 1 no. at Namakkal)
14	Total Hydrocarbon analyzer	No	6	-	
15	Ambient Ammonia analyzer	No	6	-	
16	Zero Gas Generator	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Salem and 1 no. at Namakkal)
17	Synthetic Air Cylinder	No	6	-	
18	Calibration Gas Cylinders, SO ₂ , NO, CO, NH ₃ , benzene and Toluene One each with stainless steel Regulators	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Salem and 1 no. at Namakkal)
19	Continuous emission monitoring equipment	No	6	-	
20	19 inch Rack mounting system for air analyzers	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Salem and 1 no. at Namakkal)
21	Dry Gas Meter	Yes	-	-	
22	Diesel Exhaust analyzer	No	6	-	
23	Exhaust CO/HC analyzer with Sampling Probe	No	6	-	
24	Automated Noise Monitoring System	No	6	-	
25	Integrating Sound level meter	Yes	-	-	
26	Continuous PM ₁₀ & PM _{2.5} Monitoring Analyzer TEOM system	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Salem and 1 no. at Namakkal, CAAQM station operates based on Beta ray attenuation)
27	Top loading orifice kit for calibration of HVS	Yes	-	-	
28	Permeation tubes (SO ₂ , NO-NO ₂ -NO _x , NH ₃ , BTX)	No	6	-	
C. List of Equipment required for processing of Environmental Samples:					
a) Mandatory Requirements					
1	Accelerated Solvent Extraction (ASE) System	No	6	-	

2	Ammonia distillation assembly/TKN Analyzer	Yes	-	-	
3	Analytical Balance 4/5 digit & 6 digit (Digital)	Yes	-	-	
4	Aquarium for Toxicity bioassay test with complete accessories (*4 Nos)	No	6	-	
5	Autoclave (*2 Nos)	Yes	-	-	1 No.available
6	Bacteriological Incubators Stainless steel (*2 Nos)	Yes	-	-	
7	Bio safety cabinets	Yes	-	-	
8	BOD Incubators (2 nos.)	Yes	-	-	1 No.available
9	Centrifuge	No	6	-	
10	COD Digestion heated Blocks (2) with capacity 16 nos. or more	Yes	-	-	1 No.available
11	Cyanide Distillation Assembly (3)	Yes	-	-	1 No.available
12	Deep Freezer- Capacity 500 litre	Yes	-	-	180 lr available
13	Laboratory Ball Mill Grinder	No	6	-	
14	Laboratory Grinder	No	6	-	
15	Laminar Flow bench for Microbiological analysis	Yes	-	-	
16	Magnetic Stirrer with heating system (*2 Nos)	Yes	-	-	
17	Mechanical Shaker	No	6	-	
18	Membrane Filtration assembly with vacuum pump (2 nos.)	No	6	-	
19	Microbial culture refrigerator	Yes	-	-	
20	Microwave Digester with 16 vessels/ Hot Plate	Yes	-	-	Hot plate available
21	Muffle Furnace (*1 Nos), Range 1200 C	Yes	-	-	
22	Phenol distillation assembly (3)	Yes	-	-	1 No.available
23	Plate counter, Manual/Automatic	No	6	-	
24	Digestion Chambers/ Fume hood	Yes	-	-	

25	Digital Thermometer & Humidity meter- All lab area	Yes	-	-	
26	Dispensers (Various capacities) up to 5, 10, 25 & 50 ml	Yes	-	-	
27	Filtration Assembly with vacuum pump	No	6	-	
28	Fluoride Distillation Assembly (3)	Yes	-	-	1 No.available
29	Arsenic / Fluoride Glass Distillation assemblies	Yes	-	-	
30	Glass Double Distillation Assembly /Water Purification System	Yes	-	-	water purification system available
31	Heating mantles (2 nos.)	Yes	-	-	
32	Hot plates (small, Medium and Large) (*2 nos.)	Yes	-	-	1 No.available
33	Thermo Hygrometer	Yes	-	-	
34	Imhoff Cone	No	6	-	
35	Top loading Precision Digital Balance (minimum detection 0.001mg/0.01 mg) with anti-vibration facility- 3 nos. i.e 4/5 Digit (2 nos), - 6 Digit (1 no)	Yes	-	-	
36	Refrigerators Big Size 300 litres or more, double door- 2 nos.	Yes	-	-	1 No.available
37	Rotary Evaporator (Buchi type) with water recirculating chiller	No	6	-	
38	Separating funnel shaker	No	6	-	
39	Soxhlet Apparatus	Yes	-	-	
40	Solid Phase Extraction (SPE) /SPME Extraction system	No	6	-	
41	Thermometer (Alcohol)	No	6	-	
42	Dry & wet bulb Thermometer	Yes	-	-	
43	Toxicity characteristic leaching procedure (TCLP) Extractors (Zero head and Bottle)	No	6	-	
44	Ultra sonic water bath- Capacity 3 litre	No	6	-	

45	Water Bath with temperature control (*2 Nos)	No	6	-	
46	Water Bath with temp. for mercury sample digestion- 20 BOD Bottles	No	6	-	
D. Analytical Instruments at Environmental Laboratories					
a) Mandatory Requirements					
1	Atomic Absorption spectrometer (AAS)- Flame, Hydride & Graphite Tube Atomizer (GTA)	Yes	-	-	
2	Binocular Stereo Zoom Microscope	No	6	-	
3	Bomb Calorimeter	No	6	-	
4	BTX Analyzer with BTX calibrator	No	6	-	
5	Colony counter	No	6	-	
6	Conductivity meter- 2 nos.	Yes	-	-	1 No.available
7	Environment conditioning chamber	yes	-	-	
8	Digital Burettes- 50 ml*2, 100 ml*2	No	6	-	
9	Dissolved Oxygen Meter (Bench model)	Yes	-	-	
10	Flame Photometer	Yes	-	-	
11	Flash Point Apparatus	No	6	-	
12	Gas Chromatograph Mass Spectrometer	No	6	-	
13	High Performance Liquid Chromatograph (HPLC)	No	6	-	
14	Inductively Coupled Plasma (ICP) Spectrometer-OES	No	6	-	
15	Ion Chromatograph Anion & Cations	No	6	-	
16	Methane and Non Methane (NMHC) Analyzer	No	6	-	
17	Microscope – 100x	No	6	-	
18	Microscope Binocular Research	No	6	-	
19	CO (NDIR based) Analyzer	Yes	-	-	
20	Nephelometer (Turbidity Meter)	Yes	-	-	

21	pH-Meter with combined electrode (3 point)- 2 nos.	Yes	-	-	
22	Specific ion Analyzer with ion selective electrodes	No	6	-	
23	Spectrophotometer Visible (Portable)	Yes	-	-	
24	TKN Analyzer semi-automatic with aluminum block digester	Yes	-	-	
25	UV-Vis Spectrophotometer	Yes	-	-	
26	Moisture Content Analyzer	No	6	-	
b) Optional Requirements					
1	Automatic Titration Assembly	No	6	-	
2	Carbon, Hydrogen, Nitrogen and Sulphur (CHNS) Elemental Analyzer	No	6	-	
3	EDXRF Analyzer/WDXRF Analyzer	No	6	-	
4	Fourier-transform infrared Spectrometer (FTIR)	No	6	-	
5	Flocculator (Jar testing apparatus)	No	6	-	
6	Toxic Gas Analyzer	No	6	-	
7	Organic Halogen (AOX/TOX) Analyzer	No	6	-	
8	TOC Analyzer	No	6	-	
9	High Resolution Mass Spectrometer (HRGC-HRMS)	No	6	-	
10	Inductively Coupled Plasma Mass (ICP-MS) Spectrometer	No	6	-	
11	X Ray Fluorescence (XRF) Spectrometer (Portable)	No	6	-	
Specific remarks, if any:					

Note: It is requested to please ensure that each sheet is created separately for each laboratory and rename the sheet accordingly . For e.g. Central Laboratory, Regional Laboratory etc

LABORATORY ANALYTICAL FACILITIES

Name of the Board / Committee: Tamil Nadu Pollution Control Board - Advanced Environmental Laboratory,Trichy

PART I: Facility available for monitoring of environmental parameters:

S. No.	Parameters	Facilities Available (Yes / No)	If facility is not available, Specify Timeline for addition of this parameter. (in months)	Action Taken for addition of this parameter (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. Sample Matrix / Group of Water and Wastewater					
(a) Physical Tests					
1	Temperature	Yes	-	-	
2	Colour	Yes	-	-	
3	pH	Yes	-	-	
4	Turbidity	Yes	-	-	
5	Conductivity	Yes	-	-	
6	Total Solids	Yes	-	-	
7	Total Dissolved Solids (TDS)	Yes	-	-	
8	Total Suspended Solids (TSS)	Yes	-	-	
(b) Inorganic Tests					
(i) General & Non-metallic					
1	Alkalinity	Yes	-	-	
2	Chloride	Yes	-	-	

3	Cyanide	Yes	-	-	
4	Dissolved oxygen	Yes	-	-	
5	Nitrite nitrogen	Yes	-	-	
6	Nitrate nitrogen	Yes	-	-	
7	Ammonical nitrogen	Yes	-	-	
8	Fluoride	Yes	-	-	
9	Hardness (Total)	Yes	-	-	
10	Calcium	Yes	-	-	
11	Magnesium	Yes	-	-	
12	Phosphate	Yes	-	-	
13	Sulphate	Yes	-	-	
14	Sulphide	Yes	-	-	
15	Total Residual chlorine (TRC)	Yes	-	-	
1	Aluminium (Al)	No	6		
2	Arsenic (As) Total	Yes	-	-	
3	Barium	No	6		
4	Boron	Yes	-	-	
5	Chromium (Cr) Hexavalent	Yes	-	-	
6	Chromium (Cr) Total	Yes	-	-	
7	Cadmium (Cd)	Yes	-	-	
8	Cobalt (Co)	Yes	-	-	
9	Copper (Cu)	Yes	-	-	
10	Iron (Fe)	Yes	-	-	
11	Lead (Pb)	Yes	-	-	
12	Manganese (Mn)	Yes	-	-	
13	Mercury (Hg)	Yes	-	-	
14	Nickel (Ni)	Yes	-	-	

15	Potassium (K)	Yes	-	-	
16	Sodium (Na)	Yes	-	-	
17	Vanadium (V)	No	6	-	
18	Zinc (Zn)	Yes	-	-	
19	Selenium (Se)	No	6	-	
(c) Organics (General) and Trace Organics Tests					
1	Biological Oxygen Demand (BOD)	Yes	-	-	
2	Chemical oxygen demand (COD)	Yes	-	-	
3	Oil & Grease	Yes	-	-	
4	Phenolic Compounds as C ₆ H ₅ OH	Yes	-	-	
5	Benzopyrene	No	6	-	
6	Pesticides				
6.a	Organochlorine Pesticides (OCPs) Tests				
i	Aldrin	No	6	-	
ii	Alpha Endosulphan	No	6	-	
iii	p,p'-DDT	No	6	-	
iv	Alpha-HCH	No	6	-	
v	Beta HCH	No	6	-	
vi	Beta Endosulphan	No	6	-	
vii	Gama-HCH	No	6	-	
viii	o,p'-DDT	No	6	-	
ix	p,p'-DDE	No	6	-	
6.b	Organophosphorus Pesticides (OPPs) Tests				
i	Malathion	No	6	-	
ii	Methyl parathion	No	6	-	
iii	Chlorpyriphos	No	6	-	
iv	Dimethoate	No	6	-	
v	Dieldrin	No	6	-	
vi	Ethion	No	6	-	
(d) Microbiological Tests					

1	Total Coliform	Yes	-	-	
2	Faecal Coliform	Yes	-	-	
3	E. Coli	Yes	-	-	
4	Faecal Streptococci	Yes	-	-	
(e) Toxicological Tests					
1	Bioassay method for evaluation of toxicity using fish (90% survival of fish after 96 hrs in 100% effluent)	No	6	-	
B. Sample Matrix / Group of Solid / Solid Waste					
(a) Soil / Sediment /Compost Tests					Facility available for Solid and sediment Tests
1	Cation Exchange Capacity (CEC)	Yes	-	-	
2	Electrical Conductivity (EC)	Yes	-	-	
3	Organic carbon (Chemical Method)	Yes	-	-	
4	pH	Yes	-	-	
5	Soil moisture	Yes	-	-	
6	Total nitrogen	Yes	-	-	
7	Metals by digestion (As, Cd, Cr, Pb, Ni etc.)	Yes	-	-	except As
(b) Hazardous Waste (Liquid / Slurry / Sludge / Solid / Semi-Solid) Tests					
1	Corrosivity	No	6	-	
2	Ignitability (Flash Point)	No	6	-	
3	Loss on Drying at 1050C (% Moisture Content)	No	6	-	
4	Loss on Drying at 5500C (% Organic Content)	No	6	-	
5	pH	No	6	-	
6	Organic carbon/matter (Chemical Method)	No	6	-	
7	Calorific Value	No	6	-	
8	Toxicity Characteristics leaching procedure (TCLP) Leachate and Metals in Leachate (As,Cd,Cr, Pb, Ni)	No	6	-	

C. Sample Matrix / Group of Analytes: Air					
(a) Ambient Air					
1	Nitrogen dioxide as NO2	Yes	-	-	
2	Sulphur dioxide (SO2)	Yes	-	-	
3	Particulate matter (PM10)	Yes	-	-	
4	Particulate matter (PM2.5)	Yes	-	-	
5	Carbon Monoxide	No	6	-	
6	Ozone	Yes	-	-	
7	Benzene	No	6	-	
8	Ammonia	Yes	-	-	
9	Metals in Particulate Matter, Pb	Yes	-	-	
10	Metals in Particulate Matter, As	Yes	-	-	
11	Metals in Particulate Matter, Ni	Yes	-	-	
12	Particulate Benzo-a-Pyrene (BaP)	No	6	-	
(b) Stack Gas / Stationary Source Emission					
1	Particulate Matter	Yes	-	-	
2	Sulphur Dioxide	Yes	-	-	
3	Carbon Dioxide	Yes	-	-	
4	Carbon Monoxide (NDIR based Method)	No	6	-	
5	Temperature	Yes	-	-	
6	Moisture	Yes	-	-	
7	Oxygen	Yes	-	-	
8	Oxides of Nitrogen	Yes	-	-	
9	Halides (HCL/HF)	Yes	-	-	
(c) Noise Level					
1	Ambient Noise level measurement (20 to 140 dB)	Yes	-	-	
2	Source Noise Level Measurement (Industrial process, DG set- 20 to 140dB)	Yes	-	-	

(d) Meteorological Monitoring					
1	Ambient Temperature	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
2	Wind direction	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
3	Wind speed	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
4	Relative Humidity	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
5	Mixing Height	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station

Specific remarks, if any:

PART II: Details of Laboratory Infrastructure (Instruments and Equipment)

S. No.	Name of Instrument / Equipments	Available Yes / No	If the Instrument / Equipment is not available, Specify Timeline for procurement of this instrument (in months)	Action Taken for procurement of this Instrument / Equipment (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. List of Instruments / Equipment for Sampling of Water, Wastewater and Soil / Hazardous Wastes					
a) Mandatory Requirements					
1	Portable / Pen type pH meter / pH strip	Yes	-	-	
2	Portable Dissolved Oxygen Meter / Field Fixing using chemicals	Yes	-	-	
3	Electrical Conductivity meter pen type	No	6	procurement initiated	
4	Flow meter / Physical flow measuring	No	6	-	
5	GPS / Mobile with GPS app	No	6	-	

6	Ice Box (2 nos.) (150 litre & 100 litre capacities)	Yes	-	-	
7	Thermometer	Yes	-	-	
8	Stainless steel bucket with nylon rope and mug	Yes	-	-	
9	Ground water level measuring device	No	6	-	
10	Scoop / shovel	Yes	-	-	
11	Auger / core sampler	No	6	-	
b) Optional Requirements					
1	Bottom Sampler / Depth sampler	No	6	-	
2	Chloroscope for residual chlorine	No	6	-	
3	Vandorn or equivalent water sampler (Automatic sampler when composite sampling to be done)	No	6	-	
4	Ekman Dredge	No	6	-	
B. List of Instruments / Equipment for Sampling of Ambient Air and Source Emission monitoring					
a) Mandatory Requirements					
1	Fine dust samplers PM2.5 (*4 Nos)	Yes	-	-	
2	Respirable Dust Sampler PM 10 (* 4 Nos)	Yes	-	-	
3	High Volume Sampler (SPM) (4 Nos)	Yes	-	-	
4	Handy Sampler with set of glass impingers (*2 Nos)	No	6	-	
5	Low Volume Sampler (LVS)	No	6	-	
6	Tedler bags different sizes	No	6	-	
7	Meteorological tower (All in one telescopic Mast) with sensors comprising wind speed, wind direction, ambient temp., Relative humidity, Solar radiation, rainfall etc.	Yes	-	procurement initiated	available at CAAQM stations (6 Nos.-2 Nos. at Trichy, 1 no. at Ariyalur and 1 No. at Karur, 1 No. at Pudukkottai and 1 No. at Thanjavur)
8	Nitrogen Cylinder portable	No	6	-	
9	Activated Charcoal tubes/ Tenex	No	6	-	

10	Barometer (Digital)	No	6	-	
11	Isokinetic Stack Monitoring Kit complete with Stack monitoring instrument panel with inclined cum vertical manometer, Cold Box, Vacuum pump, Glass assembly impingers	Yes	-	-	
12	Modified S type Stainless steel Pitot tube (Standard length) with Assembly	Yes	-	-	
13	Monoblock type, rotary design vacuum pump	Yes	-	-	
14	Orsat Apparatus	Yes	-	-	
15	Source emission monitoring Impingers train set with spare impingers 100 ml & 225 ml capacity	Yes	-	-	
16	Stainless steel heated Sampling Probes with thimble holders short and long	Yes	-	-	
17	Flue Gas analyzer	Yes	-	-	
18	Thermometer/ Thermocouple	Yes	-	-	
19	Calibrator for Noise Meters	Yes	-	-	
20	Digital Sound level (Noise) Metres	Yes	-	-	
21	Portable TOC Analyzer for emission monitoring.	No	6	-	
22	Polyurethane Foam PUF Sampler	No	6	-	
b) Optional Requirements					
1	Anemometer	Yes	-	-	available at CAAQM stations (6 Nos.-2 Nos. at Trichy, 1 no. at Ariyalur and 1 No. at Karur, 1 No. at Pudukkottai and 1 No. at Thanjavur)
2	Weather Monitoring system	Yes	-	-	available at CAAQM stations (6 Nos.-2 Nos. at Trichy, 1 no. at Ariyalur and 1 No. at Karur, 1 No. at Pudukkottai and 1 No. at Thanjavur)
3	Wind speed/wind direction monitor	Yes	-	-	available at CAAQM stations (6 Nos.-2 Nos. at Trichy, 1 no. at Ariyalur and 1 No. at Karur, 1 No. at Pudukkottai and 1 No. at Thanjavur)

4	Continuous Ambient Air Monitoring System, Fixed	Yes	-	-	available at CAAQM stations (6 Nos.-2 Nos. at Trichy, 1 no. at Ariyalur and 1 No. at Karur, 1 No. at Pudukkottai and 1 No. at Thanjavur)
5	Continuous PM10 Analyzer	Yes	-	-	available at CAAQM stations (6 Nos.-2 Nos. at Trichy, 1 no. at Ariyalur and 1 No. at Karur, 1 No. at Pudukkottai and 1 No. at Thanjavur)
6	Continuous Ambient Air Monitoring System, Mobile	No	6	-	
7	Continuous PM2.5 analyzer	Yes	-	-	available at CAAQM stations (6 Nos.-2 Nos. at Trichy, 1 no. at Ariyalur and 1 No. at Karur, 1 No. at Pudukkottai and 1 No. at Thanjavur)
8	Ambient Nitrogen Oxides (NO-NO2-NOx Analyzer	Yes	-	-	including Ammonia analyser , available at CAAQM stations (6 Nos.-2 Nos. at Trichy, 1 no. at Ariyalur and 1 No. at Karur, 1 No. at Pudukkottai and 1 No. at Thanjavur)
9	Ambient Ozone Analyzer	Yes	-	-	available at CAAQM stations (6 Nos.-2 Nos. at Trichy, 1 no. at Ariyalur and 1 No. at Karur, 1 No. at Pudukkottai and 1 No. at Thanjavur)
10	Ambient BTEX Analyzer	Yes	-	-	available at CAAQM stations (6 Nos.-2 Nos. at Trichy, 1 no. at Ariyalur and 1 No. at Karur, 1 No. at Pudukkottai and 1 No. at Thanjavur)
11	Multipoint Gas Calibration system	Yes	-	-	available at CAAQM stations (6 Nos.-2 Nos. at Trichy, 1 no. at Ariyalur and 1 No. at Karur, 1 No. at Pudukkottai and 1 No. at Thanjavur)
12	Ambient Sulphur Dioxide analyzer	Yes	-	-	available at CAAQM stations (6 Nos.-2 Nos. at Trichy, 1 no. at Ariyalur and 1 No. at Karur, 1 No. at Pudukkottai and 1 No. at Thanjavur)
13	Ambient Carbon Monoxide & Carbon dioxide analyzer	Yes	-	-	available at CAAQM stations (6 Nos.-2 Nos. at Trichy, 1 no. at Ariyalur and 1 No. at Karur, 1 No. at Pudukkottai and 1 No. at Thanjavur)
14	Total Hydrocarbon analyzer	No	6	-	
15	Ambient Ammonia analyzer	No	6	-	
16	Zero Gas Generator	Yes	-	-	available at CAAQM stations (6 Nos.-2 Nos. at Trichy, 1 no. at Ariyalur and 1 No. at Karur, 1 No. at Pudukkottai and 1 No. at Thanjavur)
17	Synthetic Air Cylinder	No	6	-	

18	Calibration Gas Cylinders, SO ₂ , NO, CO, NH ₃ , Benzene and Toluene One each with stainless steel Regulators	Yes	-	-	available at CAAQM stations (6 Nos.-2 Nos. at Trichy, 1 no. at Ariyalur and 1 No. at Karur, 1 No. at Pudukkottai and 1 No. at Thanjavur)
19	Continuous emission monitoring equipment	No	6	-	
20	19 inch Rack mounting system for air analyzers	Yes	-	-	available at CAAQM stations (6 Nos.-2 Nos. at Trichy, 1 no. at Ariyalur and 1 No. at Karur, 1 No. at Pudukkottai and 1 No. at Thanjavur)
21	Dry Gas Meter	Yes	-	-	
22	Diesel Exhaust analyzer	No	6	-	
23	Exhaust CO/HC analyzer with Sampling Probe	No	6	-	
24	Automated Noise Monitoring System	No	6	-	
25	Integrating Sound level meter	Yes	-	-	
26	Continuous PM ₁₀ & PM _{2.5} Monitoring Analyzer TEOM system	Yes	-	-	available at CAAQM stations (6 Nos.-2 Nos. at Trichy, 1 no. at Ariyalur and 1 No. at Karur, 1 No. at Pudukkottai and 1 No. at Thanjavur),CAAQM station operates based on Beta ray attenuation
27	Top loading orifice kit for calibration of HVS	Yes	-	-	
28	Permeation tubes (SO ₂ , NO-NO ₂ -NO _x ,NH ₃ , BTX)	No	6	-	
C. List of Equipment required for processing of Environmental Samples:					
a) Mandatory Requirements					
1	Accelerated Solvent Extraction (ASE) System	No	6	-	
2	Ammonia distillation assembly/TKN Analyzer	Yes	-	-	
3	Analytical Balance 4/5 digit & 6 digit (Digital)	Yes	-	-	
4	Aquarium for Toxicity bioassay test with complete accessories (*4 Nos)	No	6	-	
5	Autoclave (*2 Nos)	Yes	-	-	1 No. Available

6	Bacteriological Incubators Stainless steel (*2 Nos)	Yes	-	-	
7	Bio safety cabinets	Yes	-	-	
8	BOD Incubators (2 nos.)	Yes		-	1 No. Available
9	Centrifuge	No	6	-	
10	COD Digestion heated Blocks (2) with capacity 16 nos. or more	Yes	-	-	1 No. Available
11	Cyanide Distillation Assembly (3)	Yes	-	-	1 No. Available
12	Deep Freezer- Capacity 500 litre	Yes	-	-	180 ltr available
13	Laboratory Ball Mill Grinder	No	6	-	
14	Laboratory Grinder	No	6	-	
15	Laminar Flow bench for Microbiological analysis	Yes	-	-	
16	Magnetic Stirrer with heating system (*2 Nos)	Yes	-	-	
17	Mechanical Shaker	No	6	-	
18	Membrane Filtration assembly with vacuum pump (2 nos.)	No	6	-	
19	Microbial culture refrigerator	Yes	-	-	
20	Microwave Digester with 16 vessels/ Hot Plate	Yes	-	-	Hot palte available
21	Muffle Furnace (*1 Nos), Range 1200 C	Yes	-	-	
22	Phenol distillation assembly (3)	Yes	-	-	1 No. Available
23	Plate counter, Manual/Automatic	No	6	-	
24	Digestion Chambers/ Fume hood	Yes	-	-	
25	Digital Thermometer & Humidity meter- All lab area	Yes	-	-	
26	Dispensers (Various capacities) up to 5, 10, 25 & 50 ml	Yes	-	-	
27	Filtration Assembly with vacuum pump	No	6	-	
28	Fluoride Distillation Assembly (3)	Yes		-	1 No. Available

29	Arsenic / Fluoride Glass Distillation assemblies	Yes	-	-	
30	Glass Double Distillation Assembly /Water Purification System	Yes	-	-	Water purification system available
31	Heating mantles (2 nos.)	Yes	-	-	
32	Hot plates (small, Medium and Large) (*2 nos.)	Yes	-	-	1 No. Available
33	Thermo Hygrometer	Yes	-	-	
34	Imhoff Cone	No	6	-	
35	Top loading Precision Digital Balance (minimum detection 0.001mg/0.01 mg) with anti-vibration facility- 3 nos. i.e 4/5 Digit (2 nos), - 6 Digit (1 no)	Yes	-	-	
36	Refrigerators Big Size 300 litres or more, double door- 2 nos.	Yes	-	-	1 No. Available
37	Rotary Evaporator (Buchi type) with water recirculating chiller	No	6	-	
38	Separating funnel shaker	No	6	-	
39	Soxhlet Apparatus	Yes	-	-	
40	Solid Phase Extraction (SPE) /SPME Extraction system	No	6	-	
41	Thermometer (Alcohol)	No	6	-	
42	Dry & wet bulb Thermometer	Yes	-	-	
43	Toxicity characteristic leaching procedure (TCLP) Extractors (Zero head and Bottle)	No	6	-	
44	Ultra sonic water bath- Capacity 3 litre	No	6	-	
45	Water Bath with temperature control (*2 Nos)	No	6	-	
46	Water Bath with temp. for mercury sample digestion- 20 BOD Bottles	No	6	-	
D. Analytical Instruments at Environmental Laboratories					

a) Mandatory Requirements					
1	Atomic Absorption spectrometer (AAS)- Flame, Hydride & Graphite Tube Atomizer (GTA)	Yes	-	-	
2	Binocular Stereo Zoom Microscope	No	6	-	
3	Bomb Calorimeter	No	6	-	
4	BTX Analyzer with BTX calibrator	No	6	-	
5	Colony counter	No	6	-	
6	Conductivity meter- 2 nos.	Yes	-	-	1 No. Available
7	Environment conditioning chamber	yes	-	-	
8	Digital Burettes- 50 ml*2, 100 ml*2	No	6	-	
9	Dissolved Oxygen Meter (Bench model)	Yes	-	-	
10	Flame Photometer	Yes	-	-	
11	Flash Point Apparatus	No	6	-	
12	Gas Chromatograph Mass Spectrometer	No	6	-	
13	High Performance Liquid Chromatograph (HPLC)	No	6	-	
14	Inductively Coupled Plasma (ICP) Spectrometer-OES	No	6	-	
15	Ion Chromatograph Anion & Cations	No	6	-	
16	Methane and Non Methane (NMHC) Analyzer	No	6	-	
17	Microscope – 100x	No	6	-	
18	Microscope Binocular Research	No	6	-	
19	CO (NDIR based) Analyzer	Yes	-	-	
20	Nephelometer (Turbidity Meter)	Yes	-	-	
21	pH-Meter with combined electrode (3 point)- 2 nos.	Yes	-	-	
22	Specific ion Analyzer with ion selective electrodes	No	6	-	

23	Spectrophotometer Visible (Portable)	Yes	-	-	
24	TKN Analyzer semi-automatic with aluminum block digester	Yes	-	-	
25	UV-Vis Spectrophotometer	Yes	-	-	
26	Moisture Content Analyzer	No	6	-	
b) Optional Requirements					
1	Automatic Titration Assembly	No	6	-	
2	Carbon, Hydrogen, Nitrogen and Sulphur (CHNS) Elemental Analyzer	No	6	-	
3	EDXRF Analyzer/WDXRF Analyzer	No	6	-	
4	Fourier-transform infrared Spectrometer (FTIR)	No	6	-	
5	Flocculator (Jar testing apparatus)	No	6	-	
6	Toxic Gas Analyzer	No	6	-	
7	Organic Halogen (AOX/TOX) Analyzer	No	6	-	
8	TOC Analyzer	No	6	-	
9	High Resolution Mass Spectrometer (HRGC-HRMS)	No	6	-	
10	Inductively Coupled Plasma Mass (ICP-MS) Spectrometer	No	6	-	
11	X Ray Fluorescence (XRF) Spectrometer (Portable)	No	6	-	
Specific remarks, if any:					

Note: It is requested to please ensure that each sheet is created separately for each laboratory and rename the sheet accordingly . For e.g. Central Laboratory, Regional Laboratory etc

LABORATORY ANALYTICAL FACILITIES

Name of the Board / Committee: Tamil Nadu Pollution Control Board - Advanced Environmental Laboratory, Tirunelveli

PART I: Facility available for monitoring of environmental parameters:

S. No.	Parameters	Facilities Available (Yes / No)	If facility is not available, Specify Timeline for addition of this parameter. (in months)	Action Taken for addition of this parameter (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. Sample Matrix / Group of Water and Wastewater					
(a) Physical Tests					
1	Temperature	Yes	-	-	
2	Colour	Yes	-	-	
3	pH	Yes	-	-	
4	Turbidity	Yes	-	-	
5	Conductivity	Yes	-	-	
6	Total Solids	Yes	-	-	
7	Total Dissolved Solids (TDS)	Yes	-	-	
8	Total Suspended Solids (TSS)	Yes	-	-	
(b) Inorganic Tests					
(i) General & Non-metallic					
1	Alkalinity	Yes	-	-	
2	Chloride	Yes	-	-	
3	Cyanide	Yes	-	-	
4	Dissolved oxygen	Yes	-	-	
5	Nitrite nitrogen	Yes	-	-	
6	Nitrate nitrogen	Yes	-	-	
7	Ammonical nitrogen	Yes	-	-	
8	Fluoride	Yes	-	-	
9	Hardness (Total)	Yes	-	-	
10	Calcium	Yes	-	-	
11	Magnesium	Yes	-	-	

12	Phosphate	Yes	-	-	
13	Sulphate	Yes	-	-	
14	Sulphide	Yes	-	-	
15	Total Residual chlorine (TRC)	Yes	-	-	
1	Aluminium (Al)	No	6	-	
2	Arsenic (As) Total	Yes	-	-	
3	Barium	No	6	-	
4	Boron	Yes	-	-	
5	Chromium (Cr) Hexavalent	Yes	-	-	
6	Chromium (Cr) Total	Yes	-	-	
7	Cadmium (Cd)	Yes	-	-	
8	Cobalt (Co)	Yes	-	-	
9	Copper (Cu)	Yes	-	-	
10	Iron (Fe)	Yes	-	-	
11	Lead (Pb)	Yes	-	-	
12	Manganese (Mn)	Yes	-	-	
13	Mercury (Hg)	Yes	-	-	
14	Nickel (Ni)	Yes	-	-	
15	Potassium (K)	Yes	-	-	
16	Sodium (Na)	Yes	-	-	
17	Vanadium (V)	No	6	-	
18	Zinc (Zn)	Yes	-	-	
19	Selenium (Se)	No	6	-	
(c) Organics (General) and Trace Organics Tests					
1	Biological Oxygen Demand (BOD)	Yes	-	-	
2	Chemical oxygen demand (COD)	Yes	-	-	
3	Oil & Grease	Yes	-	-	
4	Phenolic Compounds as C ₆ H ₅ OH	Yes	-	-	
5	Benzopyrene	No	6	-	
6	Pesticides				
6.a Organochlorine Pesticides (OCPs) Tests					
i	Aldrin	No	6	-	
ii	Alpha Endosulphan	No	6	-	
iii	p,p'-DDT	No	6	-	
iv	Alpha-HCH	No	6	-	
v	Beta HCH	No	6	-	
vi	Beta Endosulphan	No	6	-	

vii	Gama-HCH	No	6	-	
viii	o,p'-DDT	No	6	-	
ix	p,p'-DDE	No	6	-	
6.b	Organophosphorus Pesticides (OPPs) Tests				
i	Malathion	No	6	-	
ii	Methyl parathion	No	6	-	
iii	Chlorpyriphos	No	6	-	
iv	Dimethoate	No	6	-	
v	Dieldrin	No	6	-	
vi	Ethion	No	6	-	
(d) Microbiological Tests					
1	Total Coliform	Yes	-	-	
2	Faecal Coliform	Yes	-	-	
3	E. Coli	Yes	-	-	
4	Faecal Streptococci	Yes	-	-	
(e) Toxicological Tests					
1	Bioassay method for evaluation of toxicity using fish (90% survival of fish after 96 hrs in 100% effluent)	No	6	-	
B. Sample Matrix / Group of Solid / Solid Waste					
(a) Soil / Sediment /Compost Tests					Facility available for Solid and sediment Tests
1	Cation Exchange Capacity (CEC)	Yes	-	-	
2	Electrical Conductivity (EC)	Yes	-	-	
3	Organic carbon (Chemical Method)	Yes	-	-	
4	pH	Yes	-	-	
5	Soil moisture	Yes	-	-	
6	Total nitrogen	Yes	-	-	
7	Metals by digestion (As, Cd, Cr, Pb, Ni etc.)	Yes	-	-	except As
(b) Hazardous Waste (Liquid / Slurry / Sludge / Solid / Semi-Solid) Tests					
1	Corrosivity	No	6	-	
2	Ignitability (Flash Point)	No	6	-	
3	Loss on Drying at 1050C (% Moisture Content)	No	6	-	
4	Loss on Drying at 5500C (% Organic Content)	No	6	-	
5	pH	No	6	-	
6	Organic carbon/matter (Chemical Method)	No	6	-	
7	Calorific Value	No	6	-	

8	Toxicity Characteristics leaching procedure (TCLP) Leachate and Metals in Leachate (As,Cd,Cr, Pb, Ni)	No	6	-					
C. Sample Matrix / Group of Analytes: Air									
(a) Ambient Air									
1	Nitrogen dioxide as NO2	Yes	-	-					
2	Sulphur dioxide (SO2)	Yes	-	-					
3	Particulate matter (PM10)	Yes	-	-					
4	Particulate matter (PM2.5)	Yes	-	-					
5	Carbon Monoxide	No	6	-					
6	Ozone	Yes	-	-					
7	Benzene	No	6	-					
8	Ammonia	Yes	-	-					
9	Metals in Particulate Matter, Pb	Yes	-	-					
10	Metals in Particulate Matter, As	Yes	-	-					
11	Metals in Particulate Matter, Ni	Yes	-	-					
12	Particulate Benzo-a-Pyrene (BaP)	No	6	-					
(b) Stack Gas / Stationary Source Emission									
1	Particulate Matter	Yes	-	-					
2	Sulphur Dioxide	Yes	-	-					
3	Carbon Dioxide	Yes	-	-					
4	Carbon Monoxide (NDIR based Method)	No	6	-					
5	Temperature	Yes	-	-					
6	Moisture	Yes	-	-					
7	Oxygen	Yes	-	-					
8	Oxides of Nitrogen	Yes	-	-					
9	Halides (HCL/HF)	Yes	-	-					
(c) Noise Level									
1	Ambient Noise level measurement (20 to 140 dB)	Yes	-	-					
2	Source Noise Level Measurement (Industrial process, DG set- 20 to 140dB)	Yes	-	-					
(d) Meteorological Monitoring									
1	Ambient Temperature	Yes	-	-					At present datas received from Meteorological Tower of CAAQM station
2	Wind direction	Yes	-	-					At present datas received from Meteorological Tower of CAAQM station
3	Wind speed	Yes	-	-					At present datas received from Meteorological Tower of CAAQM station
4	Relative Humidity	Yes	-	-					At present datas received from Meteorological Tower of CAAQM station

2	Respirable Dust Sampler PM 10 (* 4 Nos)	Yes	-	-					
3	High Volume Sampler (SPM) (4 Nos)	Yes	-	-					
4	Handy Sampler with set of glass impingers (*2 Nos)	No	6	-					
5	Low Volume Sampler (LVS)	No	6	-					
6	Tedler bags different sizes	No	6	-					
7	Meteorological tower (All in one telescopic Mast) with sensors comprising wind speed, wind direction, ambient temp., Relative humidity, Solar radiation, rainfall etc.	Yes	-	-				available at CAAQM station(1 No.)	
8	Nitrogen Cylinder portable	No	6	-					
9	Activated Charcoal tubes/ Tenex	No	6	-					
10	Barometer (Digital)	No	6	-					
11	Isokinetic Stack Monitoring Kit complete with Stack monitoring instrument panel with inclined cum vertical manometer, Cold Box, Vacuum pump, Glass assembly impingers	Yes	-	-					
12	Modified S type Stainless steel Pitot tube (Standard length) with Assembly	Yes	-	-					
13	Monoblock type, rotary design vacuum pump	Yes	-	-					
14	Orsat Apparatus	Yes	-	-					
15	Source emission monitoring Impingers train set with spare impingers 100 ml & 225 ml capacity	Yes	-	-					
16	Stainless steel heated Sampling Probes with thimble holders short and long	Yes	-	-					
17	Flue Gas analyzer	Yes	-	-					
18	Thermometer/ Thermocouple	Yes	-	-					
19	Calibrator for Noise Meters	Yes	-	-					
20	Digital Sound level (Noise) Metres	Yes	-	-					
21	Portable TOC Analyzer for emission monitoring.	No	6	-					
22	Polyurethane Foam PUF Sampler	No	6	-					
b) Optional Requirements									
1	Anemometer	Yes	-	-				available at CAAQM station(1 No.)	
2	Weather Monitoring system	Yes	-	-				available at CAAQM station(1 No.)	
3	Wind speed/wind direction monitor	Yes	-	-				available at CAAQM station(1 No.)	
4	Continuous Ambient Air Monitoring System, Fixed	Yes	-	-				available at CAAQM station(1 No.)	
5	Continuous PM10 Analyzer	Yes	-	-				available at CAAQM station(1 No.)	

6	Continuous Ambient Air Monitoring System, Mobile	No	6	-				
7	Continuous PM2.5 analyzer	Yes	-	-	available at CAAQM station(1 No.)			
8	Ambient Nitrogen Oxides (NO-NO2-NOx Analyzer)	Yes	-	-	including Ammonia Analyser,available at CAAQM station(1 No.)			
9	Ambient Ozone Analyzer	Yes	-	-	available at CAAQM station(1 No.)			
10	Ambient BTEX Analyzer	Yes	-	-	available at CAAQM station(1 No.)			
11	Multipoint Gas Calibration system	Yes	-	-	available at CAAQM station(1 No.)			
12	Ambient Sulphur Dioxide analyzer	Yes	-	-	available at CAAQM station(1 No.)			
13	Ambient Carbon Monoxide & Carbon dioxide analyzer	Yes	-	-	available at CAAQM station(1 No.)			
14	Total Hydrocarbon analyzer	No	6	-				
15	Ambient Ammonia analyzer	No	6	-	available at CAAQM station(1 No.)			
16	Zero Gas Generator	Yes	-	-				
17	Synthetic Air Cylinder	No	6	-				
18	Calibration Gas Cylinders, SO2, NO, CO, NH3, Benzene and Toluene One each with stainless steel Regulators	Yes	-	-	available at CAAQM station(1 No.)			
19	Continuous emission monitoring equipment	No	6	-				
20	19 inch Rack mounting system for air analyzers	Yes	-	-	available at CAAQM station(1 No.)			
21	Dry Gas Meter	Yes	-	-				
22	Diesel Exhaust analyzer	No	6	-				
23	Exhaust CO/HC analyzer with Sampling Probe	No	6	-				
24	Automated Noise Monitoring System	No	6	-				
25	Integrating Sound level meter	Yes	-	-				
26	Continuous PM10& PM2.5 Monitoring Analyzer TEOM system	Yes	-	-	available at CAAQM station(1 No.), CAAQM station operates based on Beta ray attenuation			
27	Top loading orifice kit for calibration of HVS	Yes	-	-				
28	Permeation tubes (SO2, NO-NO2-NOx,NH3, BTX)	No	6	-				
C. List of Equipment required for processing of Environmental Samples:								
a) Mandatory Requirements								
1	Accelerated Solvent Extraction (ASE) System	No	6	-				
2	Ammonia distillation assembly/TKN Analyzer	Yes	-	-				
3	Analytical Balance 4/5 digit & 6 digit (Digital)	Yes	-	-				

4	Aquarium for Toxicity bioassay test with complete accessories (*4 Nos)	No	6	-					
5	Autoclave (*2 Nos)	Yes	-	-	1 No. available				
6	Bacteriological Incubators Stainless steel (*2 Nos)	Yes	-	-					
7	Bio safety cabinets	Yes	-	-					
8	BOD Incubators (2 nos.)	Yes	-	-	1 No. available				
9	Centrifuge	No	6	-					
10	COD Digestion heated Blocks (2) with capacity 16 nos. or more	Yes	-	-	1 No. available				
11	Cyanide Distillation Assembly (3)	Yes	-	-	1 No. available				
12	Deep Freezer- Capacity 500 litre	Yes	-	-	180 lr available				
13	Laboratory Ball Mill Grinder	No	6	-					
14	Laboratory Grinder	No	6	-					
15	Laminar Flow bench for Microbiological analysis	Yes	-	-					
16	Magnetic Stirrer with heating system (*2 Nos)	Yes	-	-					
17	Mechanical Shaker	No	6	-					
18	Membrane Filtration assembly with vacuum pump (2 nos.)	No	6	-					
19	Microbial culture refrigerator	Yes	-	-					
20	Microwave Digester with 16 vessels/ Hot Plate	Yes	-	-	Hot plae available				
21	Muffle Furnace (*1 Nos), Range 1200 C	Yes	-	-					
22	Phenol distillation assembly (3)	Yes	-	-	1 No. available				
23	Plate counter, Manual/Automatic	No	6	-					
24	Digestion Chambers/ Fume hood	Yes	-	-					
25	Digital Thermometer & Humidity meter- All lab area	Yes	-	-					
26	Dispensers (Various capacities) up to 5, 10, 25 & 50 ml	Yes	-	-					
27	Filtration Assembly with vacuum pump	No	6	-					
28	Fluoride Distillation Assembly (3)	Yes	-	-	1 No. available				
29	Arsenic / Fluoride Glass Distillation assemblies	Yes	-	-					
30	Glass Double Distillation Assembly /Water Purification System	Yes	-	-	water purification system available				
31	Heating mantles (2 nos.)	Yes	-	-					
32	Hot plates (small, Medium and Large) (*2 nos.)	Yes	-	-	1 No. available				
33	Thermo Hygrometer	Yes	-	-					

34	Imhoff Cone	No	6	-					
35	Top loading Precision Digital Balance (minimum detection 0.001mg/0.01 mg) with anti-vibration facility- 3 nos. i.e 4/5 Digit (2 nos), - 6 Digit (1 no)	Yes	-	-					
36	Refrigerators Big Size 300 litres or more, double door- 2 nos.	Yes	-	-	1 No. available				
37	Rotary Evaporator (Buchi type) with water recirculating chiller	No	6	-					
38	Separating funnel shaker	No	6	-					
39	Soxhlet Apparatus	Yes	-	-					
40	Solid Phase Extraction (SPE) /SPME Extraction system	No	6	-					
41	Thermometer (Alcohol)	No	6	-					
42	Dry & wet bulb Thermometer	Yes	-	-					
43	Toxicity characteristic leaching procedure (TCLP) Extractors (Zero head and Bottle)	No	6	-					
44	Ultra sonic water bath- Capacity 3 litre	No	6	-					
45	Water Bath with temperature control (*2 Nos)	No	6	-					
46	Water Bath with temp. for mercury sample digestion- 20 BOD Bottles	No	6	-					
D. Analytical Instruments at Environmental Laboratories									
a) Mandatory Requirements									
1	Atomic Absorption spectrometer (AAS)- Flame, Hydride & Graphite Tube Atomizer (GTA)	Yes	-	-					
2	Binocular Stereo Zoom Microscope	No	6	-					
3	Bomb Calorimeter	No	6	-					
4	BTX Analyzer with BTX calibrator	No	6	-					
5	Colony counter	No	6	-					
6	Conductivity meter- 2 nos.	Yes	-	-	1 No. available				
7	Environment conditioning chamber	yes	-	-					
8	Digital Burettes- 50 ml*2, 100 ml*2	No	6	-					
9	Dissolved Oxygen Meter (Bench model)	Yes	-	-					
10	Flame Photometer	Yes	-	-					
11	Flash Point Apparatus	No	6	-					
12	Gas Chromatograph Mass Spectrometer	No	6	-					
13	High Performance Liquid Chromatograph (HPLC)	No	6	-					

14	Inductively Coupled Plasma (ICP) Spectrometer-OES	No	6	-					
15	Ion Chromatograph Anion & Cations	No	6	-					
16	Methane and Non Methane (NMHC) Analyzer	No	6	-					
17	Microscope – 100x	No	6	-					
18	Microscope Binocular Research	No	6	-					
19	CO (NDIR based) Analyzer	Yes	-	-					
20	Nephelometer (Turbidity Meter)	Yes	-	-					
21	pH-Meter with combined electrode (3 point)- 2 nos.	Yes	-	-					
22	Specific ion Analyzer with ion selective electrodes	No	6	-					
23	Spectrophotometer Visible (Portable)	Yes	-	-					
24	TKN Analyzer semi-automatic with aluminum block digester	Yes	-	-					
25	UV-Vis Spectrophotometer	Yes	-	-					
26	Moisture Content Analyzer	No	6	-					
b) Optional Requirements									
1	Automatic Titration Assembly	No	6	-					
2	Carbon, Hydrogen, Nitrogen and Sulphur (CHNS) Elemental Analyzer	No	6	-					
3	EDXRF Analyzer/WDXRF Analyzer	No	6	-					
4	Fourier-transform infrared Spectrometer (FTIR)	No	6	-					
5	Flocculator (Jar testing apparatus)	No	6	-					
6	Toxic Gas Analyzer	No	6	-					
7	Organic Halogen (AOX/TOX) Analyzer	No	6	-					
8	TOC Analyzer	No	6	-					
9	High Resolution Mass Spectrometer (HRGC-HRMS)	No	6	-					
10	Inductively Coupled Plasma Mass (ICP-MS) Spectrometer	No	6	-					
11	X Ray Fluorescence (XRF) Spectrometer (Portable)	No	6	-					
Specific remarks, if any:									

Note: It is requested to please ensure that each sheet is created separately for each laboratory and rename the sheet accordingly . For e.g. Central Laboratory, Regional Laboratory etc

LABORATORY ANALYTICAL FACILITIES

Name of the Board / Committee: Tamil Nadu Pollution Control Board - Advanced Environmental Laboratory, Vellore

PART I: Facility available for monitoring of environmental parameters:

S. No.	Parameters	Facilities Available (Yes / No)	If facility is not available, Specify Timeline for addition of this parameter. (in months)	Action Taken for addition of this parameter (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. Sample Matrix / Group of Water and Wastewater					
(a) Physical Tests					
1	Temperature	Yes	-	-	
2	Colour	Yes	-	-	
3	pH	Yes	-	-	
4	Turbidity	Yes	-	-	
5	Conductivity	Yes	-	-	
6	Total Solids	Yes	-	-	
7	Total Dissolved Solids (TDS)	Yes	-	-	
8	Total Suspended Solids (TSS)	Yes	-	-	
(b) Inorganic Tests					
(i) General & Non-metallic					
1	Alkalinity	Yes	-	-	
2	Chloride	Yes	-	-	

3	Cyanide	Yes	-	-	
4	Dissolved oxygen	Yes	-	-	
5	Nitrite nitrogen	Yes	-	-	
6	Nitrate nitrogen	Yes	-	-	
7	Ammonical nitrogen	Yes	-	-	
8	Fluoride	Yes	-	-	
9	Hardness (Total)	Yes	-	-	
10	Calcium	Yes	-	-	
11	Magnesium	Yes	-	-	
12	Phosphate	Yes	-	-	
13	Sulphate	Yes	-	-	
14	Sulphide	Yes	-	-	
15	Total Residual chlorine (TRC)	Yes	-	-	
1	Aluminium (Al)	No	6		
2	Arsenic (As) Total	Yes	-	-	
3	Barium	No	6		
4	Boron	Yes	-	-	
5	Chromium (Cr) Hexavalent	Yes	-	-	
6	Chromium (Cr) Total	Yes	-	-	
7	Cadmium (Cd)	Yes	-	-	
8	Cobalt (Co)	Yes	-	-	
9	Copper (Cu)	Yes	-	-	
10	Iron (Fe)	Yes	-	-	
11	Lead (Pb)	Yes	-	-	
12	Manganese (Mn)	Yes	-	-	
13	Mercury (Hg)	Yes	-	-	

14	Nickel (Ni)	Yes	-	-	
15	Potassium (K)	Yes	-	-	
16	Sodium (Na)	Yes	-	-	
17	Vanadium (V)	No	6	-	
18	Zinc (Zn)	Yes	-	-	
19	Selenium (Se)	No	6	-	
(c) Organics (General) and Trace Organics Tests					
1	Biological Oxygen Demand (BOD)	Yes	-	-	
2	Chemical oxygen demand (COD)	Yes	-	-	
3	Oil & Grease	Yes	-	-	
4	Phenolic Compounds as C ₆ H ₅ OH	Yes	-	-	
5	Benzopyrene	No	6	-	
6	Pesticides				
6.a	Organochlorine Pesticides (OCPs) Tests				
i	Aldrin	No	6	-	
ii	Alpha Endosulphan	No	6	-	
iii	p,p'-DDT	No	6	-	
iv	Alpha-HCH	No	6	-	
v	Beta HCH	No	6	-	
vi	Beta Endosulphan	No	6	-	
vii	Gama-HCH	No	6	-	
viii	o,p'-DDT	No	6	-	
ix	p,p'-DDE	No	6	-	
6.b	Organophosphorus Pesticides (OPPs) Tests				
i	Malathion	No	6	-	
ii	Methyl parathion	No	6	-	
iii	Chlorpyrifos	No	6	-	
iv	Dimethoate	No	6	-	
v	Dieldrin	No	6	-	

vi	Ethion	No	6	-	
(d) Microbiological Tests					
1	Total Coliform	Yes	-	-	
2	Faecal Coliform	Yes	-	-	
3	E. Coli	Yes	-	-	
4	Faecal Streptococci	Yes	-	-	
(e) Toxicological Tests					
1	Bioassay method for evaluation of toxicity using fish (90% survival of fish after 96 hrs in 100% effluent)	No	6	-	
B. Sample Matrix / Group of Solid / Solid Waste					
(a) Soil / Sediment /Compost Tests					Facility available for Solid and sediment Test
1	Cation Exchange Capacity (CEC)	Yes	-	-	
2	Electrical Conductivity (EC)	Yes	-	-	
3	Organic carbon (Chemical Method)	Yes	-	-	
4	pH	Yes	-	-	
5	Soil moisture	Yes	-	-	
6	Total nitrogen	Yes	-	-	
7	Metals by digestion (As, Cd, Cr, Pb, Ni etc.)	Yes	-	-	except As
(b) Hazardous Waste (Liquid / Slurry / Sludge / Solid / Semi-Solid) Tests					
1	Corrosivity	No	6	-	
2	Ignitability (Flash Point)	No	6	-	
3	Loss on Drying at 1050C (% Moisture Content)	No	6	-	
4	Loss on Drying at 5500C (% Organic Content)	No	6	-	
5	pH	No	6	-	
6	Organic carbon/matter (Chemical Method)	No	6	-	
7	Calorific Value	No	6	-	

8	Toxicity Characteristics leaching procedure (TCLP) Leachate and Metals in Leachate (As,Cd,Cr, Pb, Ni)	No	6	-	
C. Sample Matrix / Group of Analytes: Air					
(a) Ambient Air					
1	Nitrogen dioxide as NO2	Yes	-	-	
2	Sulphur dioxide (SO2)	Yes	-	-	
3	Particulate matter (PM10)	Yes	-	-	
4	Particulate matter (PM2.5)	Yes	-	-	
5	Carbon Monoxide	No	6	-	
6	Ozone	Yes	-	-	
7	Benzene	No	6	-	
8	Ammonia	Yes	-	-	
9	Metals in Particulate Matter, Pb	Yes	-	-	
10	Metals in Particulate Matter, As	Yes	-	-	
11	Metals in Particulate Matter, Ni	Yes	-	-	
12	Particulate Benzo-a-Pyrene (BaP)	No	6	-	
(b) Stack Gas / Stationary Source Emission					
1	Particulate Matter	Yes	-	-	
2	Sulphur Dioxide	Yes	-	-	
3	Carbon Dioxide	Yes	-	-	
4	Carbon Monoxide (NDIR based Method)	No	6	-	
5	Temperature	Yes	-	-	
6	Moisture	Yes	-	-	
7	Oxygen	Yes	-	-	
8	Oxides of Nitrogen	Yes	-	-	
9	Halides (HCL/HF)	Yes	-	-	
(c) Noise Level					

1	Ambient Noise level measurement (20 to 140 dB)	Yes	-	-	
2	Source Noise Level Measurement (Industrial process, DG set- 20 to 140dB)	Yes	-	-	

(d) Meteorological Monitoring

1	Ambient Temperature	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
2	Wind direction	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
3	Wind speed	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
4	Relative Humidity	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
5	Mixing Height	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station

Specific remarks, if any:

PART II: Details of Laboratory Infrastructure (Instruments and Equipment)

S. No.	Name of Instrument / Equipments	Available Yes / No	If the Instrument / Equipment is not available, Specify Timeline for procurement of this instrument (in months)	Action Taken for procurement of this Instrument / Equipment (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
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A. List of Instruments / Equipment for Sampling of Water, Wastewater and Soil / Hazardous Wastes

a) Mandatory Requirements

1	Portable / Pen type pH meter / pH strip	Yes	-	-	
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2	Portable Dissolved Oxygen Meter / Field Fixing using chemicals	Yes	-	-	
3	Electrical Conductivity meter pen type	No	6	procurement initiated	
4	Flow meter / Physical flow measuring	No	6	-	
5	GPS / Mobile with GPS app	No	6	-	
6	Ice Box (2 nos.) (150 litre & 100 litre capacities)	Yes	-	-	
7	Thermometer	Yes	-	-	
8	Stainless steel bucket with nylon rope and mug	Yes	-	-	
9	Ground water level measuring device	No	6	-	
10	Scoop / shovel	Yes	-	-	
11	Auger / core sampler	No	6	-	
b) Optional Requirements					
1	Bottom Sampler / Depth sampler	No	6	-	
2	Chloroscope for residual chlorine	No	6	-	
3	Vandorn or equivalent water sampler (Automatic sampler when composite sampling to be done)	No	6	-	
4	Ekman Dredge	No	6	-	
B. List of Instruments / Equipment for Sampling of Ambient Air and Source Emission monitoring					
a) Mandatory Requirements					
1	Fine dust samplers PM2.5 (*4 Nos)	Yes	-	-	
2	Respirable Dust Sampler PM 10 (* 4 Nos)	Yes	-	-	
3	High Volume Sampler (SPM) (4 Nos)	Yes	-	-	
4	Handy Sampler with set of glass impingers (*2 Nos)	No	6	-	
5	Low Volume Sampler (LVS)	No	6	-	
6	Tedler bags different sizes	No	6	-	

7	Meteorological tower (All in one telescopic Mast) with sensors comprising wind speed, wind direction, ambient temp., Relative humidity, Solar radiation, rainfall etc.	Yes	3 months	procurement initiated	available at CAAQM stations (2 Nos.-1no. at Vellore and 1 no. at Ranipet)
8	Nitrogen Cylinder portable	No	6	-	
9	Activated Charcoal tubes/ Tenex	No	6	-	
10	Barometer (Digital)	No	6	-	
11	Isokinetic Stack Monitoring Kit complete with Stack monitoring instrument panel with inclined cum vertical manometer, Cold Box, Vacuum pump, Glass assembly impingers	Yes	-	-	
12	Modified S type Stainless steel Pitot tube (Standard length) with Assembly	Yes	-	-	
13	Monoblock type, rotary design vacuum pump	Yes	-	-	
14	Orsat Apparatus	Yes	-	-	
15	Source emission monitoring Impingers train set with spare impingers 100 ml & 225 ml capacity	Yes	-	-	
16	Stainless steel heated Sampling Probes with thimble holders short and long	Yes	-	-	
17	Flue Gas analyzer	Yes	-	-	
18	Thermometer/ Thermocouple	Yes	-	-	
19	Calibrator for Noise Meters	Yes	-	-	
20	Digital Sound level (Noise) Metres	Yes	-	-	
21	Portable TOC Analyzer for emission monitoring.	No	6	-	
22	Polyurethane Foam PUF Sampler	No	6	-	
b) Optional Requirements					
1	Anemometer	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Vellore and 1 no. at Ranipet)

2	Weather Monitoring system	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Vellore and 1 no. at Ranipet)
3	Wind speed/wind direction monitor	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Vellore and 1 no. at Ranipet)
4	Continuous Ambient Air Monitoring System, Fixed	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Vellore and 1 no. at Ranipet)
5	Continuous PM10 Analyzer	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Vellore and 1 no. at Ranipet)
6	Continuous Ambient Air Monitoring System, Mobile	No	6	-	
7	Continuous PM2.5 analyzer	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Vellore and 1 no. at Ranipet)
8	Ambient Nitrogen Oxides (NO-NO2-NOx Analyzer	Yes	-	-	including Ammonia Analyser ,available at CAAQM stations (2 Nos.-1no. at Vellore and 1 no. at Ranipet)
9	Ambient Ozone Analyzer	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Vellore and 1 no. at Ranipet)
10	Ambient BTEX Analyzer	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Vellore and 1 no. at Ranipet)
11	Multipoint Gas Calibration system	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Vellore and 1 no. at Ranipet)
12	Ambient Sulphur Dioxide analyzer	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Vellore and 1 no. at Ranipet)
13	Ambient Carbon Monoxide & Carbon dioxide analyzer	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Vellore and 1 no. at Ranipet)
14	Total Hydrocarbon analyzer	No	6	-	
15	Ambient Ammonia analyzer	No	6	-	
16	Zero Gas Generator	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Vellore and 1 no. at Ranipet)
17	Synthetic Air Cylinder	No	6	-	
18	Calibration Gas Cylinders, SO2, NO, CO, NH3B ,enzene and Toluene One each with stainless steel Regulators	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Vellore and 1 no. at Ranipet)
19	Continuous emission monitoring equipment	No	6	-	

20	19 inch Rack mounting system for air analyzers	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Vellore and 1 no. at Ranipet)
21	Dry Gas Meter	Yes	-	-	
22	Diesel Exhaust analyzer	No	6	-	
23	Exhaust CO/HC analyzer with Sampling Probe	No	6	-	
24	Automated Noise Monitoring System	No	6	-	
25	Integrating Sound level meter	Yes	-	-	
26	Continuous PM10& PM2.5 Monitoring Analyzer TEOM system	Yes	-	-	available at CAAQM stations (2 Nos.-1no. at Vellore and 1 no. at Ranipet),CAAQM station operates based on Beta ray atteneuation
27	Top loading orifice kit for calibration of HVS	Yes	-	-	
28	Permeation tubes (SO2, NO-NO2-NOx,NH3, BTX)	No	6	-	
C. List of Equipment required for processing of Environmental Samples:					
a) Mandatory Requirements					
1	Accelerated Solvent Extraction (ASE) System	No	6	-	
2	Ammonia distillation assembly/TKN Analyzer	Yes	-	-	
3	Analytical Balance 4/5 digit & 6 digit (Digital)	Yes	-	-	
4	Aquarium for Toxicity bioassay test with complete accessories (*4 Nos)	No	6	-	
5	Autoclave (*2 Nos)	Yes	-	-	1 No. available
6	Bacteriological Incubators Stainless steel (*2 Nos)	Yes	-	-	
7	Bio safety cabinets	Yes	-	-	
8	BOD Incubators (2 nos.)	Yes	-	-	1 No. available
9	Centrifuge	No	6	-	

10	COD Digestion heated Blocks (2) with capacity 16 nos. or more	Yes	-	-	1 No. available
11	Cyanide Distillation Assembly (3)	Yes	-	-	1 No. available
12	Deep Freezer- Capacity 500 litre	Yes	-	-	180 ltr available
13	Laboratory Ball Mill Grinder	No	6	-	
14	Laboratory Grinder	No	6	-	
15	Laminar Flow bench for Microbiological analysis	Yes	-	-	
16	Magnetic Stirrer with heating system (*2 Nos)	Yes	-	-	
17	Mechanical Shaker	No	6	-	
18	Membrane Filtration assembly with vacuum pump (2 nos.)	No	6	-	
19	Microbial culture refrigerator	Yes	-	-	
20	Microwave Digester with 16 vessels/ Hot Plate	Yes	-	-	Hot Plate available
21	Muffle Furnace (*1 Nos), Range 1200 C	Yes	-	-	
22	Phenol distillation assembly (3)	Yes	-	-	1 No. available
23	Plate counter, Manual/Automatic	No	6	-	
24	Digestion Chambers/ Fume hood	Yes	-	-	
25	Digital Thermometer & Humidity meter- All lab area	Yes	-	-	
26	Dispensers (Various capacities) up to 5, 10, 25 & 50 ml	Yes	-	-	
27	Filtration Assembly with vacuum pump	No	6	-	
28	Fluoride Distillation Assembly (3)	Yes	-	-	1 No. available
29	Arsenic / Fluoride Glass Distillation assemblies	Yes	-	-	
30	Glass Double Distillation Assembly /Water Purification System	Yes	-	-	Water purification System available
31	Heating mantles (2 nos.)	Yes	-	-	

32	Hot plates (small, Medium and Large) (*2 nos.)	Yes	-	-	1 No. available
33	Thermo Hygrometer	Yes	-	-	
34	Imhoff Cone	No	6	-	
35	Top loading Precision Digital Balance (minimum detection 0.001mg/0.01 mg) with anti-vibration facility- 3 nos. i.e 4/5 Digit (2 nos), - 6 Digit (1 no)	Yes	-	-	
36	Refrigerators Big Size 300 litres or more, double door- 2 nos.	Yes	-	-	1 No. available
37	Rotary Evaporator (Buchi type) with water recirculating chiller	No	6	-	
38	Separating funnel shaker	No	6	-	
39	Soxhlet Apparatus	Yes	-	-	
40	Solid Phase Extraction (SPE) /SPME Extraction system	No	6	-	
41	Thermometer (Alcohol)	No	6	-	
42	Dry & wet bulb Thermometer	Yes	-	-	
43	Toxicity characteristic leaching procedure (TCLP) Extractors (Zero head and Bottle)	No	6	-	
44	Ultra sonic water bath- Capacity 3 litre	No	6	-	
45	Water Bath with temperature control (*2 Nos)	No	6	-	
46	Water Bath with temp. for mercury sample digestion- 20 BOD Bottles	No	6	-	
D. Analytical Instruments at Environmental Laboratories					
a) Mandatory Requirements					
1	Atomic Absorption spectrometer (AAS)- Flame, Hydride & Graphite Tube Atomizer (GTA)	Yes	-	-	
2	Binocular Stereo Zoom Microscope	No	6	-	

3	Bomb Calorimeter	No	6	-	
4	BTX Analyzer with BTX calibrator	No	6	-	
5	Colony counter	No	6	-	
6	Conductivity meter- 2 nos.	Yes	-	-	1 No. available
7	Environment conditioning chamber	yes	-	-	
8	Digital Burettes- 50 ml*2, 100 ml*2	No	6	-	
9	Dissolved Oxygen Meter (Bench model)	Yes	-	-	
10	Flame Photometer	Yes	-	-	
11	Flash Point Apparatus	No	6	-	
12	Gas Chromatograph Mass Spectrometer	No	6	-	
13	High Performance Liquid Chromatograph (HPLC)	No	6	-	
14	Inductively Coupled Plasma (ICP) Spectrometer-OES	No	6	-	
15	Ion Chromatograph Anion & Cations	No	6	-	
16	Methane and Non Methane (NMHC) Analyzer	No	6	-	
17	Microscope – 100x	No	6	-	
18	Microscope Binocular Research	No	6	-	
19	CO (NDIR based) Analyzer	Yes	-	-	
20	Nephelometer (Turbidity Meter)	Yes	-	-	
21	pH-Meter with combined electrode (3 point)- 2 nos.	Yes	-	-	
22	Specific ion Analyzer with ion selective electrodes	No	6	-	
23	Spectrophotometer Visible (Portable)	Yes	-	-	
24	TKN Analyzer semi-automatic with aluminum block digester	Yes	-	-	
25	UV-Vis Spectrophotometer	Yes	-	-	

26	Moisture Content Analyzer	No	6	-	
b) Optional Requirements					
1	Automatic Titration Assembly	No	6	-	
2	Carbon, Hydrogen, Nitrogen and Sulphur (CHNS) Elemental Analyzer	No	6	-	
3	EDXRF Analyzer/WDXRF Analyzer	No	6	-	
4	Fourier-transform infrared Spectrometer (FTIR)	No	6	-	
5	Flocculator (Jar testing apparatus)	No	6	-	
6	Toxic Gas Analyzer	No	6	-	
7	Organic Halogen (AOX/TOX) Analyzer	No	6	-	
8	TOC Analyzer	No	6	-	
9	High Resolution Mass Spectrometer (HRGC-HRMS)	No	6	-	
10	Inductively Coupled Plasma Mass (ICP-MS) Spectrometer	No	6	-	
11	X Ray Fluorescence (XRF) Spectrometer (Portable)	No	6	-	
Specific remarks, if any:					

Note: It is requested to please ensure that each sheet is created separately for each laboratory and rename the sheet accordingly . For e.g. Central Laboratory, Regional Laboratory etc

LABORATORY ANALYTICAL FACILITIES

Name of the Board / Committee: Tamil Nadu Pollution Control Board - District Environmental Laboratory (DEL), Ambattur

PART I: Facility available for monitoring of environmental parameters:

S. No.	Parameters	Facilities Available (Yes / No)	If facility is not available, Specify Timeline for addition of this parameter. (in months)	Action Taken for addition of this parameter (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. Sample Matrix / Group of Water and Wastewater					
(a) Physical Tests					
1	Temperature	Yes	-	-	
2	Colour	Yes	-	-	
3	pH	Yes	-	-	
4	Turbidity	Yes	-	-	
5	Conductivity	Yes	-	-	
6	Total Solids	Yes	-	-	
7	Total Dissolved Solids (TDS)	Yes	-	-	
8	Total Suspended Solids (TSS)	Yes	-	-	
(b) Inorganic Tests					
(i) General & Non-metallic					
1	Alkalinity	Yes	-	-	
2	Chloride	Yes	-	-	
3	Cyanide	Yes	-	-	
4	Dissolved oxygen	Yes	-	-	

5	Nitrite nitrogen	Yes	-	-	
6	Nitrate nitrogen	Yes	-	-	
7	Ammonical nitrogen	Yes	-	-	
8	Fluoride	Yes	-	-	
9	Hardness (Total)	Yes	-	-	
10	Calcium	Yes	-	-	
11	Magnesium	Yes	-	-	
12	Phosphate	Yes	-	-	
13	Sulphate	Yes	-	-	
14	Sulphide	Yes	-	-	
15	Total Residual chlorine (TRC)	Yes	-	-	
(ii) Trace Metals Tests					
1	Aluminium (Al)	No	6	-	
2	Arsenic (As) Total	No	6	-	
3	Barium	No	6	-	
4	Boron	Yes	-	-	
5	Chromium (Cr) Hexavalent	Yes	-	-	
6	Chromium (Cr) Total	Yes	-	-	
7	Cadmium (Cd)	Yes	-	-	
8	Cobalt (Co)	Yes	-	-	
9	Copper (Cu)	Yes	-	-	
10	Iron (Fe)	Yes	-	-	
11	Lead (Pb)	Yes	-	-	
12	Manganese (Mn)	Yes	-	-	
13	Mercury (Hg)	Yes	-	-	
14	Nickel (Ni)	Yes	-	-	
15	Potassium (K)	Yes	-	-	

16	Sodium (Na)	Yes	-	-	
17	Vanadium (V)	No	6	-	
18	Zinc (Zn)	Yes	-	-	
19	Selenium (Se)	No	6	-	
(c) Organics (General) and Trace Organics Tests					
1	Biological Oxygen Demand (BOD)	Yes	-	-	
2	Chemical oxygen demand (COD)	Yes	-	-	
3	Oil & Grease	Yes	-	-	
4	Phenolic Compounds as C ₆ H ₅ OH	Yes	-	-	
5	Benzopyrene	No	6	-	
6	Pesticides				
6.a	Organochlorine Pesticides (OCPs) Tests				
i	Aldrin	No	6	-	
ii	Alpha Endosulphan	No	6	-	
iii	p,p'-DDT	No	6	-	
iv	Alpha-HCH	No	6	-	
v	Beta HCH	No	6	-	
vi	Beta Endosulphan	No	6	-	
vii	Gama-HCH	No	6	-	
viii	o,p'-DDT	No	6	-	
ix	p,p'-DDE	No	6	-	
6.b	Organophosphorus Pesticides (OPPs) Tests				
i	Malathion	No	6	-	
ii	Methyl parathion	No	6	-	
iii	Chlorpyrifos	No	6	-	
iv	Dimethoate	No	6	-	
v	Dieldrin	No	6	-	
vi	Ethion	No	6	-	
(d) Microbiological Tests					
1	Total Coliform	No	6	-	

2	Faecal Coliform	No	6	-	
3	E. Coli	No	6	-	
4	Faecal Streptococci	No	6	-	
(e) Toxicological Tests					
1	Bioassay method for evaluation of toxicity using fish (90% survival of fish after 96 hrs in 100% effluent)	No	6	-	
B. Sample Matrix / Group of Solid / Solid Waste					
(a) Soil / Sediment/Compost Tests					Facility available for Solid and sediment Tests
1	Cation Exchange Capacity (CEC)	Yes	-	-	
2	Electrical Conductivity (EC)	Yes	-	-	
3	Organic carbon (Chemical Method)	Yes	-	-	
4	pH	Yes	-	-	
5	Soil moisture	Yes	-	-	
6	Total nitrogen	Yes	-	-	
7	Metals by digestion (As, Cd, Cr, Pb, Ni etc.)	Yes	-	-	except As
(b) Hazardous Waste (Liquid / Slurry / Sludge / Solid / Semi-Solid) Tests					
1	Corrosivity	No	6	-	
2	Ignitability (Flash Point)	No	6	-	
3	Loss on Drying at 1050C (% Moisture Content)	No	6	-	
4	Loss on Drying at 5500C (% Organic Content)	No	6	-	
5	pH	No	6	-	
6	Organic carbon/matter (Chemical Method)	No	6	-	
7	Calorific Value	No	6	-	
8	Toxicity Characteristics leaching procedure (TCLP) Leachate and Metals in Leachate (As,Cd,Cr, Pb, Ni)	No	6	-	
C. Sample Matrix / Group of Analytes: Air					

(a) Ambient Air					
1	Nitrogen dioxide as NO ₂	Yes	-	-	
2	Sulphur dioxide (SO ₂)	Yes	-	-	
3	Particulate matter (PM ₁₀)	Yes	-	-	
4	Particulate matter (PM _{2.5})	Yes	-	-	
5	Carbon Monoxide	No	6	-	
6	Ozone	Yes	-	-	
7	Benzene	No	6	-	
8	Ammonia	Yes	-	-	
9	Metals in Particulate Matter, Pb	Yes	-	-	
10	Metals in Particulate Matter, As	Yes	-	-	
11	Metals in Particulate Matter, Ni	Yes	-	-	
12	Particulate Benzo-a-Pyrene (BaP)	No	6	-	
(b) Stack Gas / Stationary Source Emission					
1	Particulate Matter	Yes	-	-	
2	Sulphur Dioxide	Yes	-	-	
3	Carbon Dioxide	Yes	-	-	
4	Carbon Monoxide (NDIR based Method)	No	6	-	
5	Temperature	Yes	-	-	
6	Moisture	Yes	-	-	
7	Oxygen	Yes	-	-	
8	Oxides of Nitrogen	Yes	-	-	
9	Halides (HCL/HF)	Yes	-	-	
(c) Noise Level					
1	Ambient Noise level measurement (20 to 140 dB)	Yes	-	-	
2	Source Noise Level Measurement (Industrial process, DG set- 20 to 140dB)	Yes	-	-	
(d) Meteorological Monitoring					

1	Ambient Temperature	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
2	Wind direction	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
3	Wind speed	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
4	Relative Humidity	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
5	Mixing Height	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station

Specific remarks, if any:

PART II: Details of Laboratory Infrastructure (Instruments and Equipment)

S. No.	Name of Instrument / Equipments	Available Yes / No	If the Instrument / Equipment is not available, Specify Timeline for procurement of this instrument (in months)	Action Taken for procurement of this Instrument / Equipment (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. List of Instruments / Equipment for Sampling of Water, Wastewater and Soil / Hazardous Wastes					
a) Mandatory Requirements					
1	Portable / Pen type pH meter / pH strip	Yes	-	-	
2	Portable Dissolved Oxygen Meter / Field Fixing using chemicals	Yes	-	-	
3	Electrical Conductivity meter pen type	No	6	procurement initiated	
4	Flow meter / Physical flow measuring	No	6	-	
5	GPS / Mobile with GPS app	No	6	-	

6	Ice Box (2 nos.) (150 litre & 100 litre capacities)	Yes	-	-	
7	Thermometer	Yes	-	-	
8	Stainless steel bucket with nylon rope and mug	Yes	-	-	
9	Ground water level measuring device	No	6	-	
10	Scoop / shovel	Yes	-	-	
11	Auger / core sampler	No	6	-	
b) Optional Requirements					
1	Bottom Sampler / Depth sampler	Yes	-	-	
2	Chloroscope for residual chlorine	No	6	-	
3	Vandorn or equivalent water sampler (Automatic sampler when composite sampling to be done)	No	6	-	
4	Ekman Dredge	No	6	-	
B. List of Instruments / Equipment for Sampling of Ambient Air and Source Emission monitoring					
a) Mandatory Requirements					
1	Fine dust samplers PM2.5 (*4 Nos)	Yes	-	-	
2	Respirable Dust Sampler PM 10 (* 4 Nos)	Yes	-	-	
3	High Volume Sampler (SPM) (4 Nos)	Yes	-	-	
4	Handy Sampler with set of glass impingers (*2 Nos)	No	6	-	
5	Low Volume Sampler (LVS)	No	6	-	
6	Tedler bags different sizes	No	6	-	
7	Meteorological tower (All in one telescopic Mast) with sensors comprising wind speed, wind direction, ambient temp., Relative humidity, Solar radiation, rainfall etc.	Yes	-	-	available at CAAQM station (1 No.)
8	Nitrogen Cylinder portable	No	6	-	
9	Activated Charcoal tubes/ Tenex	No	6	-	

10	Barometer (Digital)	No	6	-	
11	Isokinetic Stack Monitoring Kit complete with Stack monitoring instrument panel with inclined cum vertical manometer, Cold Box, Vacuum pump, Glass assembly impingers	Yes	-	-	
12	Modified S type Stainless steel Pitot tube (Standard length) with Assembly	Yes	-	-	
13	Monoblock type, rotary design vacuum pump	Yes	-	-	
14	Orsat Apparatus	Yes	-	-	
15	Source emission monitoring Impingers train set with spare impingers 100 ml & 225 ml capacity	Yes	-	-	
16	Stainless steel heated Sampling Probes with thimble holders short and long	Yes	-	-	
17	Flue Gas analyzer	Yes	-	-	
18	Thermometer/ Thermocouple	Yes	-	-	
19	Calibrator for Noise Meters	Yes	-	-	
20	Digital Sound level (Noise) Metres	Yes	-	-	
21	Portable TOC Analyzer for emission monitoring.	No	6	-	
22	Polyurethane Foam PUF Sampler	No	6	-	
b) Optional Requirements					
1	Anemometer	Yes	-	-	available at CAAQM station (1 No.)
2	Weather Monitoring system	Yes	-	-	available at CAAQM station (1 No.)
3	Wind speed/wind direction monitor	Yes	-	-	available at CAAQM station (1 No.)
4	Continuous Ambient Air Monitoring System, Fixed	Yes	-	-	available at CAAQM station (1 No.)
5	Continuous PM10 Analyzer	Yes	-	-	available at CAAQM station (1 No.)
6	Continuous Ambient Air Monitoring System, Mobile	No	6	-	

7	Continuous PM2.5 analyzer	Yes	-	-	available at CAAQM station (1 No.)
8	Ambient Nitrogen Oxides (NO-NO2-NOx Analyzer)	Yes	-	-	including Ammonia Analyser ,available at CAAQM station (1 No.)
9	Ambient Ozone Analyzer	Yes	-	-	available at CAAQM station (1 No.)
10	Ambient BTEX Analyzer	Yes	-	-	available at CAAQM station (1 No.)
11	Multipoint Gas Calibration system	Yes	-	-	available at CAAQM station (1 No.)
12	Ambient Sulphur Dioxide analyzer	Yes	-	-	available at CAAQM station (1 No.)
13	Ambient Carbon Monoxide & Carbon dioxide analyzer	Yes	-	-	available at CAAQM station (1 No.)
14	Total Hydrocarbon analyzer	No	6	-	
15	Ambient Ammonia analyzer	No	6	-	
16	Zero Gas Generator	Yes	-	-	available at CAAQM station (1 No.)
17	Synthetic Air Cylinder	No	6	-	
18	Calibration Gas Cylinders, SO2, NO, CO, NH3, Benzene and Toluene One each with stainless steel Regulators	Yes	-	-	available at CAAQM station (1 No.)
19	Continuous emission monitoring equipment	No	6	-	
20	19 inch Rack mounting system for air analyzers	Yes	-	-	available at CAAQM station (1 No.)
21	Dry Gas Meter	Yes	-	-	
22	Diesel Exhaust analyzer	No	6	-	
23	Exhaust CO/HC analyzer with Sampling Probe	No	6	-	
24	Automated Noise Monitoring System	No	6	-	
25	Integrating Sound level meter	No	6	-	
26	Continuous PM10& PM2.5 Monitoring Analyzer TEOM system	Yes	-	-	available at CAAQM station (1 No.),CAAQM station operates based on Beta ray attenuation
27	Top loading orifice kit for calibration of HVS	Yes	-	-	

28	Permeation tubes (SO ₂ , NO-NO ₂ -NO _x ,NH ₃ , BTX)	No	6	-	
C. List of Equipment required for processing of Environmental Samples:					
a) Mandatory Requirements					
1	Accelerated Solvent Extraction (ASE) System	No	6	-	
2	Ammonia distillation assembly/TKN Analyzer	Yes	-	-	
3	Analytical Balance 4/5 digit & 6 digit (Digital)	Yes	-	-	
4	Aquarium for Toxicity bioassay test with complete accessories (*4 Nos)	No	6	-	
5	Autoclave (*2 Nos)	Yes	-	-	1 No. available
6	Bacteriological Incubators Stainless steel (*2 Nos)	Yes	-	-	
7	Bio safety cabinets	Yes	-	-	
8	BOD Incubators (2 nos.)	Yes	-	-	1 No. available
9	Centrifuge	No	6	-	
10	COD Digestion heated Blocks (2) with capacity 16 nos. or more	Yes	-	-	1 No. available
11	Cyanide Distillation Assembly (3)	Yes	-	-	1 No. available
12	Deep Freezer- Capacity 500 litre	Yes	-	-	180 lr available
13	Laboratory Ball Mill Grinder	No	6	-	
14	Laboratory Grinder	No	6	-	
15	Laminar Flow bench for Microbiological analysis	No	6	-	
16	Magnetic Stirrer with heating system (*2 Nos)	Yes	-	-	
17	Mechanical Shaker	No	6	-	
18	Membrane Filtration assembly with vacuum pump (2 nos.)	No	6	-	
19	Microbial culture refrigerator	No	6	-	

20	Microwave Digester with 16 vessels/ Hot Plate	Yes	-	-	Hot plate available
21	Muffle Furnace (*1 Nos), Range 1200 C	Yes	-	-	
22	Phenol distillation assembly (3)	Yes	-	-	1 No. available
23	Plate counter, Manual/Automatic	No	6	-	
24	Digestion Chambers/ Fume hood	Yes	-	-	
25	Digital Thermometer & Humidity meter- All lab area	Yes	-	-	
26	Dispensers (Various capacities) up to 5, 10, 25 & 50 ml	Yes	-	-	
27	Filtration Assembly with vacuum pump	No	6	-	
28	Fluoride Distillation Assembly (3)	Yes	-	-	1 No. available
29	Arsenic / Fluoride Glass Distillation assemblies	Yes	-	-	
30	Glass Double Distillation Assembly /Water Purification System	Yes	-	-	Water Purification system available
31	Heating mantles (2 nos.)	Yes	-	-	
32	Hot plates (small, Medium and Large) (*2 nos.)	Yes	-	-	1 No. available
33	Thermo Hygrometer	No	6	-	
34	Imhoff Cone	No	6	-	
35	Top loading Precision Digital Balance (minimum detection 0.001mg/0.01 mg) with anti-vibration facility- 3 nos. i.e 4/5 Digit (2 nos), - 6 Digit (1 no)	Yes	-	-	
36	Refrigerators Big Size 300 litres or more, double door- 2 nos.	Yes	-	-	1 No. available
37	Rotary Evaporator (Buchi type) with water recirculating chiller	No	6	-	
38	Separating funnel shaker	No	6	-	
39	Soxhlet Apparatus	Yes	-	-	

40	Solid Phase Extraction (SPE) /SPME Extraction system	No	6	-	
41	Thermometer (Alcohol)	No	6	-	
42	Dry & wet bulb Thermometer	No	6	-	
43	Toxicity characteristic leaching procedure (TCLP) Extractors (Zero head and Bottle)	No	6	-	
44	Ultra sonic water bath- Capacity 3 litre	No	6	-	
45	Water Bath with temperature control (*2 Nos)	Yes	-	-	available without temperature control
46	Water Bath with temp. for mercury sample digestion- 20 BOD Bottles	No	6	-	
D. Analytical Instruments at Environmental Laboratories					
a) Mandatory Requirements					
1	Atomic Absorption spectrometer (AAS)- Flame, Hydride & Graphite Tube Atomizer (GTA)	Yes	-	-	
2	Binocular Stereo Zoom Microscope	No	6	-	
3	Bomb Calorimeter	No	6	-	
4	BTX Analyzer with BTX calibrator	No	6	-	
5	Colony counter	No	6	-	
6	Conductivity meter- 2 nos.	Yes	-	-	1 No. available
7	Environment conditioning chamber	yes	-	-	
8	Digital Burettes- 50 ml*2, 100 ml*2	No	6	-	
9	Dissolved Oxygen Meter (Bench model)	Yes	-	-	
10	Flame Photometer	Yes	-	-	
11	Flash Point Apparatus	No	6	-	
12	Gas Chromatograph Mass Spectrometer	No	6	-	
13	High Performance Liquid Chromatograph (HPLC)	No	6	-	

14	Inductively Coupled Plasma (ICP) Spectrometer-OES	No	6	-	
15	Ion Chromatograph Anion & Cations	No	6	-	
16	Methane and Non Methane (NMHC) Analyzer	No	6	-	
17	Microscope – 100x	No	6	-	
18	Microscope Binocular Research	No	6	-	
19	CO (NDIR based) Analyzer	Yes	-	-	
20	Nephelometer (Turbidity Meter)	Yes	-	-	
21	pH-Meter with combined electrode (3 point)- 2 nos.	Yes	-	-	1 No. available
22	Specific ion Analyzer with ion selective electrodes	No	6	-	
23	Spectrophotometer Visible (Portable)	No	6	-	
24	TKN Analyzer semi-automatic with aluminum block digester	Yes	-	-	
25	UV-Vis Spectrophotometer	Yes	-	-	
26	Moisture Content Analyzer	No	6	-	
b) Optional Requirements					
1	Automatic Titration Assembly	No	6	-	
2	Carbon, Hydrogen, Nitrogen and Sulphur (CHNS) Elemental Analyzer	No	6	-	
3	EDXRF Analyzer/WDXRF Analyzer	No	6	-	
4	Fourier-transform infrared Spectrometer (FTIR)	No	6	-	
5	Flocculator (Jar testing apparatus)	No	6	-	
6	Toxic Gas Analyzer	No	6	-	
7	Organic Halogen (AOX/TOX) Analyzer	No	6	-	
8	TOC Analyzer	No	6	-	
9	High Resolution Mass Spectrometer (HRGC-HRMS)	No	6	-	

10	Inductively Coupled Plasma Mass (ICP-MS) Spectrometer	No	6	-	
11	X Ray Fluorescence (XRF) Spectrometer (Portable)	No	6	-	
Specific remarks, if any:					

Note: It is requested to please ensure that each sheet is created separately for each laboratory and rename the sheet accordingly . For e.g. Central Laboratory, Regional Laboratory etc

LABORATORY ANALYTICAL FACILITIES

Name of the Board / Committee: Tamil Nadu Pollution Control Board - District Environmental Laboratory (DEL), Dindigul

PART I: Facility available for monitoring of environmental parameters:

S. No.	Parameters	Facilities Available (Yes / No)	If facility is not available, Specify Timeline for addition of this parameter. (in months)	Action Taken for addition of this parameter (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. Sample Matrix / Group of Water and Wastewater					
(a) Physical Tests					
1	Temperature	Yes	-	-	
2	Colour	Yes	-	-	
3	pH	Yes	-	-	
4	Turbidity	Yes	-	-	
5	Conductivity	Yes	-	-	
6	Total Solids	Yes	-	-	
7	Total Dissolved Solids (TDS)	Yes	-	-	
8	Total Suspended Solids (TSS)	Yes	-	-	
(b) Inorganic Tests					
(i) General & Non-metallic					
1	Alkalinity	Yes	-	-	
2	Chloride	Yes	-	-	
3	Cyanide	Yes	-	-	
4	Dissolved oxygen	Yes	-	-	

5	Nitrite nitrogen	Yes	-	-	
6	Nitrate nitrogen	Yes	-	-	
7	Ammonical nitrogen	Yes	-	-	
8	Fluoride	Yes	-	-	
9	Hardness (Total)	Yes	-	-	
10	Calcium	Yes	-	-	
11	Magnesium	Yes	-	-	
12	Phosphate	Yes	-	-	
13	Sulphate	Yes	-	-	
14	Sulphide	Yes	-	-	
15	Total Residual chlorine (TRC)	Yes	-	-	
(ii) Trace Metals Tests					
1	Aluminium (Al)	No	6	-	
2	Arsenic (As) Total	No	6	-	
3	Barium	No	6	-	
4	Boron	Yes	-	-	
5	Chromium (Cr) Hexavalent	Yes	-	-	
6	Chromium (Cr) Total	Yes	-	-	
7	Cadmium (Cd)	Yes	-	-	
8	Cobalt (Co)	Yes	-	-	
9	Copper (Cu)	Yes	-	-	
10	Iron (Fe)	Yes	-	-	
11	Lead (Pb)	Yes	-	-	
12	Manganese (Mn)	Yes	-	-	
13	Mercury (Hg)	Yes	-	-	
14	Nickel (Ni)	Yes	-	-	
15	Potassium (K)	Yes	-	-	

16	Sodium (Na)	Yes	-	-	
17	Vanadium (V)	No	6	-	
18	Zinc (Zn)	Yes	-	-	
19	Selenium (Se)	No	6	-	
(c) Organics (General) and Trace Organics Tests					
1	Biological Oxygen Demand (BOD)	Yes	-	-	
2	Chemical oxygen demand (COD)	Yes	-	-	
3	Oil & Grease	Yes	-	-	
4	Phenolic Compounds as C ₆ H ₅ OH	Yes	-	-	
5	Benzopyrene	No	6	-	
6	Pesticides				
6.a	Organochlorine Pesticides (OCPs) Tests				
i	Aldrin	No	6	-	
ii	Alpha Endosulphan	No	6	-	
iii	p,p'-DDT	No	6	-	
iv	Alpha-HCH	No	6	-	
v	Beta HCH	No	6	-	
vi	Beta Endosulphan	No	6	-	
vii	Gama-HCH	No	6	-	
viii	o,p'-DDT	No	6	-	
ix	p,p'-DDE	No	6	-	
6.b	Organophosphorus Pesticides (OPPs) Tests				
i	Malathion	No	6	-	
ii	Methyl parathion	No	6	-	
iii	Chlorpyrifos	No	6	-	
iv	Dimethoate	No	6	-	
v	Dieldrin	No	6	-	
vi	Ethion	No	6	-	
(d) Microbiological Tests					
1	Total Coliform	No	6	-	

2	Faecal Coliform	No	6	-	
3	E. Coli	No	6	-	
4	Faecal Streptococci	No	6	-	
(e) Toxicological Tests					
1	Bioassay method for evaluation of toxicity using fish (90% survival of fish after 96 hrs in 100% effluent)	No	6	-	
B. Sample Matrix / Group of Solid / Solid Waste					
(a) Soil / Sediment/Compost Tests					Facility available for Solid and sediment Tests
1	Cation Exchange Capacity (CEC)	Yes	-	-	
2	Electrical Conductivity (EC)	Yes	-	-	
3	Organic carbon (Chemical Method)	Yes	-	-	
4	pH	Yes	-	-	
5	Soil moisture	Yes	-	-	
6	Total nitrogen	Yes	-	-	
7	Metals by digestion (As, Cd, Cr, Pb, Ni etc.)	Yes	-	-	except As
(b) Hazardous Waste (Liquid / Slurry / Sludge / Solid / Semi-Solid) Tests					
1	Corrosivity	No	6	-	
2	Ignitability (Flash Point)	No	6	-	
3	Loss on Drying at 1050C (% Moisture Content)	No	6	-	
4	Loss on Drying at 5500C (% Organic Content)	No	6	-	
5	pH	No	6	-	
6	Organic carbon/matter (Chemical Method)	No	6	-	
7	Calorific Value	No	6	-	
8	Toxicity Characteristics leaching procedure (TCLP) Leachate and Metals in Leachate (As,Cd,Cr, Pb, Ni)	No	6	-	

C. Sample Matrix / Group of Analytes: Air					
(a) Ambient Air					
1	Nitrogen dioxide as NO2	Yes	-	-	
2	Sulphur dioxide (SO2)	Yes	-	-	
3	Particulate matter (PM10)	Yes	-	-	
4	Particulate matter (PM2.5)	Yes	-	-	
5	Carbon Monoxide	No	6	-	
6	Ozone	Yes	-	-	
7	Benzene	No	6	-	
8	Ammonia	Yes	-	-	
9	Metals in Particulate Matter, Pb	Yes	-	-	
10	Metals in Particulate Matter, As	Yes	-	-	
11	Metals in Particulate Matter, Ni	Yes	-	-	
12	Particulate Benzo-a-Pyrene (BaP)	No	6	-	
(b) Stack Gas / Stationary Source Emission					
1	Particulate Matter	Yes	-	-	
2	Sulphur Dioxide	Yes	-	-	
3	Carbon Dioxide	Yes	-	-	
4	Carbon Monoxide (NDIR based Method)	No	6	-	
5	Temperature	Yes	-	-	
6	Moisture	Yes	-	-	
7	Oxygen	Yes	-	-	
8	Oxides of Nitrogen	Yes	-	-	
9	Halides (HCL/HF)	Yes	-	-	
(c) Noise Level					
1	Ambient Noise level measurement (20 to 140 dB)	Yes	-	-	
2	Source Noise Level Measurement (Industrial process, DG set- 20 to 140dB)	Yes	-	-	

(d) Meteorological Monitoring					
1	Ambient Temperature	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
2	Wind direction	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
3	Wind speed	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
4	Relative Humidity	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
5	Mixing Height	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station

Specific remarks, if any:

PART II: Details of Laboratory Infrastructure (Instruments and Equipment)

S. No.	Name of Instrument / Equipments	Available Yes / No	If the Instrument / Equipment is not available, Specify Timeline for procurement of this instrument (in months)	Action Taken for procurement of this Instrument / Equipment (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. List of Instruments / Equipment for Sampling of Water, Wastewater and Soil / Hazardous Wastes					
a) Mandatory Requirements					
1	Portable / Pen type pH meter / pH strip	Yes	-	-	
2	Portable Dissolved Oxygen Meter / Field Fixing using chemicals	Yes	-	-	
3	Electrical Conductivity meter pen type	No	6	procurement initiated	
4	Flow meter / Physical flow measuring	No	6	-	
5	GPS / Mobile with GPS app	No	6	-	

6	Ice Box (2 nos.) (150 litre & 100 litre capacities)	Yes	-	-	
7	Thermometer	Yes	-	-	
8	Stainless steel bucket with nylon rope and mug	Yes	-	-	
9	Ground water level measuring device	No	6	-	
10	Scoop / shovel	Yes	-	-	
11	Auger / core sampler	No	6	-	
b) Optional Requirements					
1	Bottom Sampler / Depth sampler	Yes	-	-	
2	Chloroscope for residual chlorine	No	6	-	
3	Vandorn or equivalent water sampler (Automatic sampler when composite sampling to be done)	No	6	-	
4	Ekman Dredge	No	6	-	
B. List of Instruments / Equipment for Sampling of Ambient Air and Source Emission monitoring					
a) Mandatory Requirements					
1	Fine dust samplers PM2.5 (*4 Nos)	Yes	-	-	
2	Respirable Dust Sampler PM 10 (* 4 Nos)	Yes	-	-	
3	High Volume Sampler (SPM) (4 Nos)	Yes	-	-	
4	Handy Sampler with set of glass impingers (*2 Nos)	No	6	-	
5	Low Volume Sampler (LVS)	No	6	-	
6	Tedler bags different sizes	No	6	-	
7	Meteorological tower (All in one telescopic Mast) with sensors comprising wind speed, wind direction, ambient temp., Relative humidity, Solar radiation, rainfall etc.	Yes	-	-	available at CAAQM station (1 No.)
8	Nitrogen Cylinder portable	No	6	-	
9	Activated Charcoal tubes/ Tenex	No	6	-	

10	Barometer (Digital)	No	6	-	
11	Isokinetic Stack Monitoring Kit complete with Stack monitoring instrument panel with inclined cum vertical manometer, Cold Box, Vacuum pump, Glass assembly impingers	Yes	-	-	
12	Modified S type Stainless steel Pitot tube (Standard length) with Assembly	Yes	-	-	
13	Monoblock type, rotary design vacuum pump	Yes	-	-	
14	Orsat Apparatus	Yes	-	-	
15	Source emission monitoring Impingers train set with spare impingers 100 ml & 225 ml capacity	Yes	-	-	
16	Stainless steel heated Sampling Probes with thimble holders short and long	Yes	-	-	
17	Flue Gas analyzer	Yes	-	-	
18	Thermometer/ Thermocouple	Yes	-	-	
19	Calibrator for Noise Meters	Yes	-	-	
20	Digital Sound level (Noise) Metres	Yes	-	-	
21	Portable TOC Analyzer for emission monitoring.	No	6	-	
22	Polyurethane Foam PUF Sampler	No	6	-	
b) Optional Requirements					
1	Anemometer	Yes	-	-	available at CAAQM station (1 No.)
2	Weather Monitoring system	Yes	-	-	available at CAAQM station (1 No.)
3	Wind speed/wind direction monitor	Yes	-	-	available at CAAQM station (1 No.)
4	Continuous Ambient Air Monitoring System, Fixed	Yes	-	-	available at CAAQM station (1 No.)
5	Continuous PM10 Analyzer	Yes	-	-	available at CAAQM station (1 No.)
6	Continuous Ambient Air Monitoring System, Mobile	No	6	-	

7	Continuous PM2.5 analyzer	Yes	-	-	available at CAAQM station (1 No.)
8	Ambient Nitrogen Oxides (NO-NO2-NOx Analyzer)	Yes	-	-	including Ammonia analyser ,available at CAAQM station (1 No.)including Ammonia analyser,
9	Ambient Ozone Analyzer	Yes	-	-	available at CAAQM station (1 No.)
10	Ambient BTEX Analyzer	Yes	-	-	available at CAAQM station (1 No.)
11	Multipoint Gas Calibration system	Yes	-	-	available at CAAQM station (1 No.)
12	Ambient Sulphur Dioxide analyzer	Yes	-	-	available at CAAQM station (1 No.)
13	Ambient Carbon Monoxide & Carbon dioxide analyzer	Yes	-	-	available at CAAQM station (1 No.)
14	Total Hydrocarbon analyzer	No	6	-	
15	Ambient Ammonia analyzer	No	6	-	
16	Zero Gas Generator	Yes	-	-	available at CAAQM station (1 No.)
17	Synthetic Air Cylinder	No	6	-	
18	Calibration Gas Cylinders, SO2, NO, CO, NH3, Benzene and Toluene One each with stainless steel Regulators	Yes	-	-	available at CAAQM station (1 No.)
19	Continuous emission monitoring equipment	No	6	-	
20	19 inch Rack mounting system for air analyzers	Yes	-	-	available at CAAQM station (1 No.)
21	Dry Gas Meter	Yes	-	-	
22	Diesel Exhaust analyzer	No	6	-	
23	Exhaust CO/HC analyzer with Sampling Probe	No	6	-	
24	Automated Noise Monitoring System	No	6	-	
25	Integrating Sound level meter	No	6	-	
26	Continuous PM10& PM2.5 Monitoring Analyzer TEOM system	Yes	-	-	available at CAAQM station (1 No.),CAAQM station operates based on Beta ray attenuation
27	Top loading orifice kit for calibration of HVS	Yes	-	-	

28	Permeation tubes (SO ₂ , NO-NO ₂ -NO _x ,NH ₃ , BTX)	No	6	-	
C. List of Equipment required for processing of Environmental Samples:					
a) Mandatory Requirements					
1	Accelerated Solvent Extraction (ASE) System	No	6	-	
2	Ammonia distillation assembly/TKN Analyzer	Yes	-	-	
3	Analytical Balance 4/5 digit & 6 digit (Digital)	Yes	-	-	
4	Aquarium for Toxicity bioassay test with complete accessories (*4 Nos)	No	6	-	
5	Autoclave (*2 Nos)	Yes	-	-	1 No. available
6	Bacteriological Incubators Stainless steel (*2 Nos)	Yes	-	-	
7	Bio safety cabinets	Yes	-	-	
8	BOD Incubators (2 nos.)	Yes	-	-	1 No. available
9	Centrifuge	No	6	-	
10	COD Digestion heated Blocks (2) with capacity 16 nos. or more	Yes	-	-	1 No. available
11	Cyanide Distillation Assembly (3)	Yes	-	-	1 No. available
12	Deep Freezer- Capacity 500 litre	Yes	-	-	180 ltr available
13	Laboratory Ball Mill Grinder	No	6	-	
14	Laboratory Grinder	No	6	-	
15	Laminar Flow bench for Microbiological analysis	No	6	-	
16	Magnetic Stirrer with heating system (*2 Nos)	Yes	-	-	
17	Mechanical Shaker	No	6	-	
18	Membrane Filtration assembly with vacuum pump (2 nos.)	No	6	-	
19	Microbial culture refrigerator	No	6	-	

20	Microwave Digester with 16 vessels/ Hot Plate	Yes	-	-	Hot plate available
21	Muffle Furnace (*1 Nos), Range 1200 C	Yes	-	-	
22	Phenol distillation assembly (3)	Yes	-	-	1 No. available
23	Plate counter, Manual/Automatic	No	6	-	
24	Digestion Chambers/ Fume hood	Yes	-	-	
25	Digital Thermometer & Humidity meter- All lab area	Yes	-	-	
26	Dispensers (Various capacities) up to 5, 10, 25 & 50 ml	Yes	-	-	
27	Filtration Assembly with vacuum pump	No	6	-	
28	Fluoride Distillation Assembly (3)	Yes	-	-	1 No. available
29	Arsenic / Fluoride Glass Distillation assemblies	Yes	-	-	
30	Glass Double Distillation Assembly /Water Purification System	Yes	-	-	Waer Purification System available
31	Heating mantles (2 nos.)	Yes	-	-	
32	Hot plates (small, Medium and Large) (*2 nos.)	Yes	-	-	1 No. available
33	Thermo Hygrometer	No	6	-	
34	Imhoff Cone	No	6	-	
35	Top loading Precision Digital Balance (minimum detection 0.001mg/0.01 mg) with anti-vibration facility- 3 nos. i.e 4/5 Digit (2 nos), - 6 Digit (1 no)	Yes	-	-	
36	Refrigerators Big Size 300 litres or more, double door- 2 nos.	Yes	-	-	1 No. available
37	Rotary Evaporator (Buchi type) with water recirculating chiller	No	6	-	
38	Separating funnel shaker	No	6	-	
39	Soxhlet Apparatus	Yes	-	-	

40	Solid Phase Extraction (SPE) /SPME Extraction system	No	6	-	
41	Thermometer (Alcohol)	No	6	-	
42	Dry & wet bulb Thermometer	No	6	-	
43	Toxicity characteristic leaching procedure (TCLP) Extractors (Zero head and Bottle)	No	6	-	
44	Ultra sonic water bath- Capacity 3 litre	No	6	-	
45	Water Bath with temperature control (*2 Nos)	Yes	-	-	available without temperature control
46	Water Bath with temp. for mercury sample digestion- 20 BOD Bottles	No	6	-	
D. Analytical Instruments at Environmental Laboratories					
a) Mandatory Requirements					
1	Atomic Absorption spectrometer (AAS)- Flame, Hydride & Graphite Tube Atomizer (GTA)	Yes	-	-	
2	Binocular Stereo Zoom Microscope	No	6	-	
3	Bomb Calorimeter	No	6	-	
4	BTX Analyzer with BTX calibrator	No	6	-	
5	Colony counter	No	6	-	
6	Conductivity meter- 2 nos.	Yes	-	-	1 No. available
7	Environment conditioning chamber	yes	-	-	
8	Digital Burettes- 50 ml*2, 100 ml*2	No	6	-	
9	Dissolved Oxygen Meter (Bench model)	Yes	-	-	
10	Flame Photometer	Yes	-	-	
11	Flash Point Apparatus	No	6	-	
12	Gas Chromatograph Mass Spectrometer	No	6	-	
13	High Performance Liquid Chromatograph (HPLC)	No	6	-	

14	Inductively Coupled Plasma (ICP) Spectrometer-OES	No	6	-	
15	Ion Chromatograph Anion & Cations	No	6	-	
16	Methane and Non Methane (NMHC) Analyzer	No	6	-	
17	Microscope – 100x	No	6	-	
18	Microscope Binocular Research	No	6	-	
19	CO (NDIR based) Analyzer	Yes	-	-	
20	Nephelometer (Turbidity Meter)	Yes	-	-	
21	pH-Meter with combined electrode (3 point)- 2 nos.	Yes	-	-	1 No. available
22	Specific ion Analyzer with ion selective electrodes	No	6	-	
23	Spectrophotometer Visible (Portable)	No	6	-	
24	TKN Analyzer semi-automatic with aluminum block digester	Yes	-	-	
25	UV-Vis Spectrophotometer	Yes	-	-	
26	Moisture Content Analyzer	No	6	-	
b) Optional Requirements					
1	Automatic Titration Assembly	No	6	-	
2	Carbon, Hydrogen, Nitrogen and Sulphur (CHNS) Elemental Analyzer	No	6	-	
3	EDXRF Analyzer/WDXRF Analyzer	No	6	-	
4	Fourier-transform infrared Spectrometer (FTIR)	No	6	-	
5	Flocculator (Jar testing apparatus)	No	6	-	
6	Toxic Gas Analyzer	No	6	-	
7	Organic Halogen (AOX/TOX) Analyzer	No	6	-	
8	TOC Analyzer	No	6	-	
9	High Resolution Mass Spectrometer (HRGC-HRMS)	No	6	-	

10	Inductively Coupled Plasma Mass (ICP-MS) Spectrometer	No	6	-	
11	X Ray Fluorescence (XRF) Spectrometer (Portable)	No	6	-	
Specific remarks, if any:					

Note: It is requested to please ensure that each sheet is created separately for each laboratory and rename the sheet accordingly . For e.g. Central Laboratory, Regional Laboratory etc

LABORATORY ANALYTICAL FACILITIES

Name of the Board / Committee: Tamil Nadu Pollution Control Board - District Environmental Laboratory (DEL), Hosur

PART I: Facility available for monitoring of environmental parameters:

S. No.	Parameters	Facilities Available (Yes / No)	If facility is not available, Specify Timeline for addition of this parameter. (in months)	Action Taken for addition of this parameter (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. Sample Matrix / Group of Water and Wastewater					
(a) Physical Tests					
1	Temperature	Yes	-	-	
2	Colour	Yes	-	-	
3	pH	Yes	-	-	
4	Turbidity	Yes	-	-	
5	Conductivity	Yes	-	-	
6	Total Solids	Yes	-	-	
7	Total Dissolved Solids (TDS)	Yes	-	-	
8	Total Suspended Solids (TSS)	Yes	-	-	
(b) Inorganic Tests					
(i) General & Non-metallic					
1	Alkalinity	Yes	-	-	
2	Chloride	Yes	-	-	
3	Cyanide	Yes	-	-	
4	Dissolved oxygen	Yes	-	-	

5	Nitrite nitrogen	Yes	-	-	
6	Nitrate nitrogen	Yes	-	-	
7	Ammonical nitrogen	Yes	-	-	
8	Fluoride	Yes	-	-	
9	Hardness (Total)	Yes	-	-	
10	Calcium	Yes	-	-	
11	Magnesium	Yes	-	-	
12	Phosphate	Yes	-	-	
13	Sulphate	Yes	-	-	
14	Sulphide	Yes	-	-	
15	Total Residual chlorine (TRC)	Yes	-	-	
(ii) Trace Metals Tests					
1	Aluminium (Al)	No	6	-	
2	Arsenic (As) Total	No	6	-	
3	Barium	No	6	-	
4	Boron	Yes	-	-	
5	Chromium (Cr) Hexavalent	Yes	-	-	
6	Chromium (Cr) Total	Yes	-	-	
7	Cadmium (Cd)	Yes	-	-	
8	Cobalt (Co)	Yes	-	-	
9	Copper (Cu)	Yes	-	-	
10	Iron (Fe)	Yes	-	-	
11	Lead (Pb)	Yes	-	-	
12	Manganese (Mn)	Yes	-	-	
13	Mercury (Hg)	Yes	-	-	
14	Nickel (Ni)	Yes	-	-	
15	Potassium (K)	Yes	-	-	

16	Sodium (Na)	Yes	-	-	
17	Vanadium (V)	No	6	-	
18	Zinc (Zn)	Yes	-	-	
19	Selenium (Se)	No	6	-	
(c) Organics (General) and Trace Organics Tests					
1	Biological Oxygen Demand (BOD)	Yes	-	-	
2	Chemical oxygen demand (COD)	Yes	-	-	
3	Oil & Grease	Yes	-	-	
4	Phenolic Compounds as C ₆ H ₅ OH	Yes	-	-	
5	Benzopyrene	No	6	-	
6	Pesticides				
6.a	Organochlorine Pesticides (OCPs) Tests				
i	Aldrin	No	6	-	
ii	Alpha Endosulphan	No	6	-	
iii	p,p'-DDT	No	6	-	
iv	Alpha-HCH	No	6	-	
v	Beta HCH	No	6	-	
vi	Beta Endosulphan	No	6	-	
vii	Gama-HCH	No	6	-	
viii	o,p'-DDT	No	6	-	
ix	p,p'-DDE	No	6	-	
6.b	Organophosphorus Pesticides (OPPs) Tests				
i	Malathion	No	6	-	
ii	Methyl parathion	No	6	-	
iii	Chlorpyrifos	No	6	-	
iv	Dimethoate	No	6	-	
v	Dieldrin	No	6	-	
vi	Ethion	No	6	-	
(d) Microbiological Tests					
1	Total Coliform	No	6	-	

2	Faecal Coliform	No	6	-	
3	E. Coli	No	6	-	
4	Faecal Streptococci	No	6	-	
(e) Toxicological Tests					
1	Bioassay method for evaluation of toxicity using fish (90% survival of fish after 96 hrs in 100% effluent)	No	6	-	
B. Sample Matrix / Group of Solid / Solid Waste					
(a) Soil / Sediment/Compost Tests					Facility available for Solid and sediment Tests
1	Cation Exchange Capacity (CEC)	Yes	-	-	
2	Electrical Conductivity (EC)	Yes	-	-	
3	Organic carbon (Chemical Method)	Yes	-	-	
4	pH	Yes	-	-	
5	Soil moisture	Yes	-	-	
6	Total nitrogen	Yes	-	-	
7	Metals by digestion (As, Cd, Cr, Pb, Ni etc.)	Yes	-	-	Except As
(b) Hazardous Waste (Liquid / Slurry / Sludge / Solid / Semi-Solid) Tests					
1	Corrosivity	No	6	-	
2	Ignitability (Flash Point)	No	6	-	
3	Loss on Drying at 1050C (% Moisture Content)	No	6	-	
4	Loss on Drying at 5500C (% Organic Content)	No	6	-	
5	pH	No	6	-	
6	Organic carbon/matter (Chemical Method)	No	6	-	
7	Calorific Value	No	6	-	
8	Toxicity Characteristics leaching procedure (TCLP) Leachate and Metals in Leachate (As,Cd,Cr, Pb, Ni)	No	6	-	

C. Sample Matrix / Group of Analytes: Air					
(a) Ambient Air					
1	Nitrogen dioxide as NO2	Yes	-	-	
2	Sulphur dioxide (SO2)	Yes	-	-	
3	Particulate matter (PM10)	Yes	-	-	
4	Particulate matter (PM2.5)	Yes	-	-	
5	Carbon Monoxide	No	6	-	
6	Ozone	Yes	-	-	
7	Benzene	No	6	-	
8	Ammonia	Yes	-	-	
9	Metals in Particulate Matter, Pb	Yes	-	-	
10	Metals in Particulate Matter, As	Yes	-	-	
11	Metals in Particulate Matter, Ni	Yes	-	-	
12	Particulate Benzo-a-Pyrene (BaP)	No	6	-	
(b) Stack Gas / Stationary Source Emission					
1	Particulate Matter	Yes	-	-	
2	Sulphur Dioxide	Yes	-	-	
3	Carbon Dioxide	Yes	-	-	
4	Carbon Monoxide (NDIR based Method)	No	6	-	
5	Temperature	Yes	-	-	
6	Moisture	Yes	-	-	
7	Oxygen	Yes	-	-	
8	Oxides of Nitrogen	Yes	-	-	
9	Halides (HCL/HF)	Yes	-	-	
(c) Noise Level					
1	Ambient Noise level measurement (20 to 140 dB)	Yes	-	-	
2	Source Noise Level Measurement (Industrial process, DG set- 20 to 140dB)	Yes	-	-	

(d) Meteorological Monitoring					
1	Ambient Temperature	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
2	Wind direction	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
3	Wind speed	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
4	Relative Humidity	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
5	Mixing Height	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station

Specific remarks, if any:

PART II: Details of Laboratory Infrastructure (Instruments and Equipment)

S. No.	Name of Instrument / Equipments	Available Yes / No	If the Instrument / Equipment is not available, Specify Timeline for procurement of this instrument (in months)	Action Taken for procurement of this Instrument / Equipment (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. List of Instruments / Equipment for Sampling of Water, Wastewater and Soil / Hazardous Wastes					
a) Mandatory Requirements					
1	Portable / Pen type pH meter / pH strip	Yes	-	-	
2	Portable Dissolved Oxygen Meter / Field Fixing using chemicals	Yes	-	-	
3	Electrical Conductivity meter pen type	No	6	procurement initiated	
4	Flow meter / Physical flow measuring	No	6	-	
5	GPS / Mobile with GPS app	No	6	-	

6	Ice Box (2 nos.) (150 litre & 100 litre capacities)	Yes	-	-	
7	Thermometer	Yes	-	-	
8	Stainless steel bucket with nylon rope and mug	Yes	-	-	
9	Ground water level measuring device	No	6	-	
10	Scoop / shovel	Yes	-	-	
11	Auger / core sampler	No	6	-	
b) Optional Requirements					
1	Bottom Sampler / Depth sampler	No	6	-	
2	Chloroscope for residual chlorine	No	6	-	
3	Vandorn or equivalent water sampler (Automatic sampler when composite sampling to be done)	No	6	-	
4	Ekman Dredge	No	6	-	
B. List of Instruments / Equipment for Sampling of Ambient Air and Source Emission monitoring					
a) Mandatory Requirements					
1	Fine dust samplers PM2.5 (*4 Nos)	Yes	-	-	
2	Respirable Dust Sampler PM 10 (* 4 Nos)	Yes	-	-	
3	High Volume Sampler (SPM) (4 Nos)	Yes	-	-	
4	Handy Sampler with set of glass impingers (*2 Nos)	No	6	-	
5	Low Volume Sampler (LVS)	No	6	-	
6	Tedler bags different sizes	No	6	-	
7	Meteorological tower (All in one telescopic Mast) with sensors comprising wind speed, wind direction, ambient temp., Relative humidity, Solar radiation, rainfall etc.	Yes	-	-	available at CAAQM station(1 No.)
8	Nitrogen Cylinder portable	No	6	-	
9	Activated Charcoal tubes/ Tenex	No	6	-	

10	Barometer (Digital)	No	6	-	
11	Isokinetic Stack Monitoring Kit complete with Stack monitoring instrument panel with inclined cum vertical manometer, Cold Box, Vacuum pump, Glass assembly impingers	Yes	-	-	
12	Modified S type Stainless steel Pitot tube (Standard length) with Assembly	Yes	-	-	
13	Monoblock type, rotary design vacuum pump	Yes	-	-	
14	Orsat Apparatus	Yes	-	-	
15	Source emission monitoring Impingers train set with spare impingers 100 ml & 225 ml capacity	Yes	-	-	
16	Stainless steel heated Sampling Probes with thimble holders short and long	Yes	-	-	
17	Flue Gas analyzer	Yes	-	-	
18	Thermometer/ Thermocouple	Yes	-	-	
19	Calibrator for Noise Meters	Yes	-	-	
20	Digital Sound level (Noise) Metres	Yes	-	-	
21	Portable TOC Analyzer for emission monitoring.	No	6	-	
22	Polyurethane Foam PUF Sampler	No	6	-	
b) Optional Requirements					
1	Anemometer	Yes	-	-	available at CAAQM station(1 No.)
2	Weather Monitoring system	Yes	-	-	available at CAAQM station(1 No.)
3	Wind speed/wind direction monitor	Yes	-	-	available at CAAQM station(1 No.)
4	Continuous Ambient Air Monitoring System, Fixed	Yes	-	-	available at CAAQM station(1 No.)
5	Continuous PM10 Analyzer	Yes	-	-	available at CAAQM station(1 No.)
6	Continuous Ambient Air Monitoring System, Mobile	No	6	-	

7	Continuous PM2.5 analyzer	Yes	-	-	available at CAAQM station(1 No.)
8	Ambient Nitrogen Oxides (NO-NO2-NOx Analyzer	Yes	-	-	including Ammonia analyser,available at CAAQM station(1 No.)
9	Ambient Ozone Analyzer	Yes	-	-	available at CAAQM station(1 No.)
10	Ambient BTEX Analyzer	Yes	-	-	available at CAAQM station(1 No.)
11	Multipoint Gas Calibration system	Yes	-	-	available at CAAQM station(1 No.)
12	Ambient Sulphur Dioxide analyzer	Yes	-	-	available at CAAQM station(1 No.)
13	Ambient Carbon Monoxide & Carbon dioxide analyzer	Yes	-	-	available at CAAQM station(1 No.)
14	Total Hydrocarbon analyzer	No	6	-	
15	Ambient Ammonia analyzer	No	6	-	
16	Zero Gas Generator	Yes	-	-	available at CAAQM station(1 No.)
17	Synthetic Air Cylinder	No	6	-	
18	Calibration Gas Cylinders, SO2, NO, CO, NH3, Benzene and Toluene One each with stainless steel Regulators	Yes	-	-	available at CAAQM station(1 No.)
19	Continuous emission monitoring equipment	No	6	-	
20	19 inch Rack mounting system for air analyzers	Yes	-	-	available at CAAQM station(1 No.)
21	Dry Gas Meter	Yes	-	-	
22	Diesel Exhaust analyzer	No	6	-	
23	Exhaust CO/HC analyzer with Sampling Probe	No	6	-	
24	Automated Noise Monitoring System	No	6	-	
25	Integrating Sound level meter	No	6	-	
26	Continuous PM10& PM2.5 Monitoring Analyzer TEOM system	Yes	-	-	available at CAAQM station(1 No.),CAAQM station operates based on Beta ray attenuation
27	Top loading orifice kit for calibration of HVS	Yes	-	-	

28	Permeation tubes (SO ₂ , NO-NO ₂ -NO _x , NH ₃ , BTX)	No	6	-	
C. List of Equipment required for processing of Environmental Samples:					
a) Mandatory Requirements					
1	Accelerated Solvent Extraction (ASE) System	No	6	-	
2	Ammonia distillation assembly/TKN Analyzer	Yes	-	-	
3	Analytical Balance 4/5 digit & 6 digit (Digital)	Yes	-	-	
4	Aquarium for Toxicity bioassay test with complete accessories (*4 Nos)	No	6	-	
5	Autoclave (*2 Nos)	Yes	-	-	1 No. available
6	Bacteriological Incubators Stainless steel (*2 Nos)	Yes	-	-	
7	Bio safety cabinets	Yes	-	-	
8	BOD Incubators (2 nos.)	Yes	-	-	1 No. available
9	Centrifuge	No	6	-	
10	COD Digestion heated Blocks (2) with capacity 16 nos. or more	Yes	-	-	1 No. available
11	Cyanide Distillation Assembly (3)	Yes	-	-	1 No. available
12	Deep Freezer- Capacity 500 litre	Yes	-	-	180 ltr available
13	Laboratory Ball Mill Grinder	No	6	-	
14	Laboratory Grinder	No	6	-	
15	Laminar Flow bench for Microbiological analysis	No	6	-	
16	Magnetic Stirrer with heating system (*2 Nos)	Yes	-	-	
17	Mechanical Shaker	No	6	-	
18	Membrane Filtration assembly with vacuum pump (2 nos.)	No	6	-	
19	Microbial culture refrigerator	No	6	-	

20	Microwave Digester with 16 vessels/ Hot Plate	Yes	-	-	Hot plate available
21	Muffle Furnace (*1 Nos), Range 1200 C	Yes	-	-	
22	Phenol distillation assembly (3)	Yes	-	-	1 No. available
23	Plate counter, Manual/Automatic	No	6	-	
24	Digestion Chambers/ Fume hood	Yes	-	-	
25	Digital Thermometer & Humidity meter- All lab area	Yes	-	-	
26	Dispensers (Various capacities) up to 5, 10, 25 & 50 ml	Yes	-	-	
27	Filtration Assembly with vacuum pump	No	6	-	
28	Fluoride Distillation Assembly (3)	Yes	-	-	1 No. available
29	Arsenic / Fluoride Glass Distillation assemblies	Yes	-	-	
30	Glass Double Distillation Assembly /Water Purification System	Yes	-	-	Waer Purifcation sysem available
31	Heating mantles (2 nos.)	Yes	-	-	
32	Hot plates (small, Medium and Large) (*2 nos.)	Yes	-	-	1 No. available
33	Thermo Hygrometer	No	6	-	
34	Imhoff Cone	No	6	-	
35	Top loading Precision Digital Balance (minimum detection 0.001mg/0.01 mg) with anti-vibration facility- 3 nos. i.e 4/5 Digit (2 nos), - 6 Digit (1 no)	Yes	-	-	
36	Refrigerators Big Size 300 litres or more, double door- 2 nos.	Yes	-	-	1 No. available
37	Rotary Evaporator (Buchi type) with water recirculating chiller	No	6	-	
38	Separating funnel shaker	No	6	-	
39	Soxhlet Apparatus	Yes	-	-	

40	Solid Phase Extraction (SPE) /SPME Extraction system	No	6	-	
41	Thermometer (Alcohol)	No	6	-	
42	Dry & wet bulb Thermometer	No	6	-	
43	Toxicity characteristic leaching procedure (TCLP) Extractors (Zero head and Bottle)	No	6	-	
44	Ultra sonic water bath- Capacity 3 litre	No	6	-	
45	Water Bath with temperature control (*2 Nos)	Yes	-	-	available without temperature control
46	Water Bath with temp. for mercury sample digestion- 20 BOD Bottles	No	6	-	
D. Analytical Instruments at Environmental Laboratories					
a) Mandatory Requirements					
1	Atomic Absorption spectrometer (AAS)- Flame, Hydride & Graphite Tube Atomizer (GTA)	Yes	-	-	
2	Binocular Stereo Zoom Microscope	No	6	-	
3	Bomb Calorimeter	No	6	-	
4	BTX Analyzer with BTX calibrator	No	6	-	
5	Colony counter	No	6	-	
6	Conductivity meter- 2 nos.	Yes	-	-	1 No. available
7	Environment conditioning chamber	yes	-	-	
8	Digital Burettes- 50 ml*2, 100 ml*2	No	6	-	
9	Dissolved Oxygen Meter (Bench model)	Yes	-	-	
10	Flame Photometer	Yes	-	-	
11	Flash Point Apparatus	No	6	-	
12	Gas Chromatograph Mass Spectrometer	No	6	-	
13	High Performance Liquid Chromatograph (HPLC)	No	6	-	

14	Inductively Coupled Plasma (ICP) Spectrometer-OES	No	6	-	
15	Ion Chromatograph Anion & Cations	No	6	-	
16	Methane and Non Methane (NMHC) Analyzer	No	6	-	
17	Microscope – 100x	No	6	-	
18	Microscope Binocular Research	No	6	-	
19	CO (NDIR based) Analyzer	Yes	-	-	
20	Nephelometer (Turbidity Meter)	Yes	-	-	
21	pH-Meter with combined electrode (3 point)- 2 nos.	Yes	-	-	1 No. available
22	Specific ion Analyzer with ion selective electrodes	No	6	-	
23	Spectrophotometer Visible (Portable)	No	6	-	
24	TKN Analyzer semi-automatic with aluminum block digester	Yes	-	-	
25	UV-Vis Spectrophotometer	Yes	-	-	
26	Moisture Content Analyzer	No	6	-	
b) Optional Requirements					
1	Automatic Titration Assembly	No	6	-	
2	Carbon, Hydrogen, Nitrogen and Sulphur (CHNS) Elemental Analyzer	No	6	-	
3	EDXRF Analyzer/WDXRF Analyzer	No	6	-	
4	Fourier-transform infrared Spectrometer (FTIR)	No	6	-	
5	Flocculator (Jar testing apparatus)	No	6	-	
6	Toxic Gas Analyzer	No	6	-	
7	Organic Halogen (AOX/TOX) Analyzer	No	6	-	
8	TOC Analyzer	No	6	-	
9	High Resolution Mass Spectrometer (HRGC-HRMS)	No	6	-	

10	Inductively Coupled Plasma Mass (ICP-MS) Spectrometer	No	6	-	
11	X Ray Fluorescence (XRF) Spectrometer (Portable)	No	6	-	
Specific remarks, if any:					

Note: It is requested to please ensure that each sheet is created separately for each laboratory and rename the sheet accordingly . For e.g. Central Laboratory, Regional Laboratory etc

LABORATORY ANALYTICAL FACILITIES

Name of the Board / Committee: Tamil Nadu Pollution Control Board - District Environmental Laboratory (DEL), Manali

PART I: Facility available for monitoring of environmental parameters:

S. No.	Parameters	Facilities Available (Yes / No)	If facility is not available, Specify Timeline for addition of this parameter. (in months)	Action Taken for addition of this parameter (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. Sample Matrix / Group of Water and Wastewater					
(a) Physical Tests					
1	Temperature	Yes	-	-	
2	Colour	Yes	-	-	
3	pH	Yes	-	-	
4	Turbidity	Yes	-	-	
5	Conductivity	Yes	-	-	
6	Total Solids	Yes	-	-	
7	Total Dissolved Solids (TDS)	Yes	-	-	
8	Total Suspended Solids (TSS)	Yes	-	-	
(b) Inorganic Tests					
(i) General & Non-metallic					
1	Alkalinity	Yes	-	-	
2	Chloride	Yes	-	-	
3	Cyanide	Yes	-	-	
4	Dissolved oxygen	Yes	-	-	
5	Nitrite nitrogen	Yes	-	-	

6	Nitrate nitrogen	Yes	-	-	
7	Ammonical nitrogen	Yes	-	-	
8	Fluoride	Yes	-	-	
9	Hardness (Total)	Yes	-	-	
10	Calcium	Yes	-	-	
11	Magnesium	Yes	-	-	
12	Phosphate	Yes	-	-	
13	Sulphate	Yes	-	-	
14	Sulphide	Yes	-	-	
15	Total Residual chlorine (TRC)	Yes	-	-	
(ii) Trace Metals Tests					
1	Aluminium (Al)	No	6	-	
2	Arsenic (As) Total	No	6	-	
3	Barium	No	6	-	
4	Boron	Yes	-	-	
5	Chromium (Cr) Hexavalent	Yes	-	-	
6	Chromium (Cr) Total	Yes	-	-	
7	Cadmium (Cd)	Yes	-	-	
8	Cobalt (Co)	Yes	-	-	
9	Copper (Cu)	Yes	-	-	
10	Iron (Fe)	Yes	-	-	
11	Lead (Pb)	Yes	-	-	
12	Manganese (Mn)	Yes	-	-	
13	Mercury (Hg)	Yes	-	-	
14	Nickel (Ni)	Yes	-	-	
15	Potassium (K)	Yes	-	-	
16	Sodium (Na)	Yes	-	-	
17	Vanadium (V)	No	6	-	
18	Zinc (Zn)	Yes	-	-	

19	Selenium (Se)	No	6	-	
(c) Organics (General) and Trace Organics Tests					
1	Biological Oxygen Demand (BOD)	Yes	-	-	
2	Chemical oxygen demand (COD)	Yes	-	-	
3	Oil & Grease	Yes	-	-	
4	Phenolic Compounds as C ₆ H ₅ OH	Yes	-	-	
5	Benzopyrene	No	6	-	
6	Pesticides				
6.a	Organochlorine Pesticides (OCPs) Tests				
i	Aldrin	No	6	-	
ii	Alpha Endosulphan	No	6	-	
iii	p,p'-DDT	No	6	-	
iv	Alpha-HCH	No	6	-	
v	Beta HCH	No	6	-	
vi	Beta Endosulphan	No	6	-	
vii	Gama-HCH	No	6	-	
viii	o,p'-DDT	No	6	-	
ix	p,p'-DDE	No	6	-	
6.b	Organophosphorus Pesticides (OPPs) Tests				
i	Malathion	No	6	-	
ii	Methyl parathion	No	6	-	
iii	Chlorpyrifos	No	6	-	
iv	Dimethoate	No	6	-	
v	Dieldrin	No	6	-	
vi	Ethion	No	6	-	
(d) Microbiological Tests					
1	Total Coliform	No	6	-	
2	Faecal Coliform	No	6	-	
3	E. Coli	No	6	-	
4	Faecal Streptococci	No	6	-	
(e) Toxicological Tests					

1	Bioassay method for evaluation of toxicity using fish (90% survival of fish after 96 hrs in 100% effluent)	No	6	-	
B. Sample Matrix / Group of Solid / Solid Waste					
(a) Soil / Sediment/Compost Tests					Facility available for Solid and sediment Tests
1	Cation Exchange Capacity (CEC)	Yes	-	-	
2	Electrical Conductivity (EC)	Yes	-	-	
3	Organic carbon (Chemical Method)	Yes	-	-	
4	pH	Yes	-	-	
5	Soil moisture	Yes	-	-	
6	Total nitrogen	Yes	-	-	
7	Metals by digestion (As, Cd, Cr, Pb, Ni etc.)	Yes	-	-	except As
(b) Hazardous Waste (Liquid / Slurry / Sludge / Solid / Semi-Solid) Tests					
1	Corrosivity	No	6	-	
2	Ignitability (Flash Point)	No	6	-	
3	Loss on Drying at 1050C (% Moisture Content)	No	6	-	
4	Loss on Drying at 5500C (% Organic Content)	No	6	-	
5	pH	No	6	-	
6	Organic carbon/matter (Chemical Method)	No	6	-	
7	Calorific Value	No	6	-	
8	Toxicity Characteristics leaching procedure (TCLP) Leachate and Metals in Leachate (As,Cd,Cr, Pb, Ni)	No	6	-	
C. Sample Matrix / Group of Analytes: Air					
(a) Ambient Air					
1	Nitrogen dioxide as NO2	Yes	-	-	
2	Sulphur dioxide (SO2)	Yes	-	-	
3	Particulate matter (PM10)	Yes	-	-	
4	Particulate matter (PM2.5)	Yes	-	-	

5	Carbon Monoxide	Yes	-	-	
6	Ozone	Yes	-	-	
7	Benzene	No	6	-	
8	Ammonia	Yes	-	-	
9	Metals in Particulate Matter, Pb	Yes	-	-	
10	Metals in Particulate Matter, As	Yes	-	-	
11	Metals in Particulate Matter, Ni	Yes	-	-	
12	Particulate Benzo-a-Pyrene (BaP)	No	6	-	
(b) Stack Gas / Stationary Source Emission					
1	Particulate Matter	Yes	-	-	
2	Sulphur Dioxide	Yes	-	-	
3	Carbon Dioxide	Yes	-	-	
4	Carbon Monoxide (NDIR based Method)	No	6	-	
5	Temperature	Yes	-	-	
6	Moisture	Yes	-	-	
7	Oxygen	Yes	-	-	
8	Oxides of Nitrogen	Yes	-	-	
9	Halides (HCL/HF)	Yes	-	-	
(c) Noise Level					
1	Ambient Noise level measurement (20 to 140 dB)	Yes	-	-	
2	Source Noise Level Measurement (Industrial process, DG set- 20 to 140dB)	Yes	-	-	
(d) Meteorological Monitoring					
1	Ambient Temperature	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
2	Wind direction	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
3	Wind speed	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
4	Relative Humidity	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station

5	Mixing Height	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
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Specific remarks, if any:

PART II: Details of Laboratory Infrastructure (Instruments and Equipment)

S. No.	Name of Instrument / Equipments	Available Yes / No	If the Instrument / Equipment is not available, Specify Timeline for procurement of this instrument (in months)	Action Taken for procurement of this Instrument / Equipment (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. List of Instruments / Equipment for Sampling of Water, Wastewater and Soil / Hazardous Wastes					
a) Mandatory Requirements					
1	Portable / Pen type pH meter / pH strip	Yes	-	-	
2	Portable Dissolved Oxygen Meter / Field Fixing using chemicals	Yes	-	-	
3	Electrical Conductivity meter pen type	No	6	procurement initiated	
4	Flow meter / Physical flow measuring	No	6	-	
5	GPS / Mobile with GPS app	No	6	-	
6	Ice Box (2 nos.) (150 litre & 100 litre capacities)	Yes	-	-	
7	Thermometer	Yes	-	-	
8	Stainless steel bucket with nylon rope and mug	Yes	-	-	
9	Ground water level measuring device	No	6	-	
10	Scoop / shovel	Yes	-	-	
11	Auger / core sampler	No	6	-	
b) Optional Requirements					

1	Bottom Sampler / Depth sampler	No	6	-	
2	Chloroscope for residual chlorine	No	6	-	
3	Vandorn or equivalent water sampler (Automatic sampler when composite sampling to be done)	No	6	-	
4	Ekman Dredge	No	6	-	
B. List of Instruments / Equipment for Sampling of Ambient Air and Source Emission monitoring					
a) Mandatory Requirements					
1	Fine dust samplers PM2.5 (*4 Nos)	Yes	-	-	
2	Respirable Dust Sampler PM 10 (* 4 Nos)	Yes	-	-	
3	High Volume Sampler (SPM) (4 Nos)	Yes	-	-	
4	Handy Sampler with set of glass impingers (*2 Nos)	No	6	-	
5	Low Volume Sampler (LVS)	No	6	-	
6	Tedler bags different sizes	No	6	-	
7	Meteorological tower (All in one telescopic Mast) with sensors comprising wind speed, wind direction, ambient temp., Relative humidity, Solar radiation, rainfall etc.	Yes	-	-	available at CAAQM stations (5 Nos.- 1 No. at Royapuram, Kodungaiyur and Koyambedu, Chennai and 2 nos. at Thiruvallur
8	Nitrogen Cylinder portable	No	6	-	
9	Activated Charcoal tubes/ Tenex	No	6	-	
10	Barometer (Digital)	No	6	-	
11	Isokinetic Stack Monitoring Kit complete with Stack monitoring instrument panel with inclined cum vertical manometer, Cold Box, Vacuum pump, Glass assembly impingers	Yes	-	-	
12	Modified S type Stainless steel Pitot tube (Standard length) with Assembly	Yes	-	-	
13	Monoblock type, rotary design vacuum pump	Yes	-	-	
14	Orsat Apparatus	Yes	-	-	

15	Source emission monitoring Impingers train set with spare impingers 100 ml & 225 ml capacity	Yes	-	-	
16	Stainless steel heated Sampling Probes with thimble holders short and long	Yes	-	-	
17	Flue Gas analyzer	Yes	-	-	
18	Thermometer/ Thermocouple	Yes	-	-	
19	Calibrator for Noise Meters	Yes	-	-	
20	Digital Sound level (Noise) Metres	Yes	-	-	
21	Portable TOC Analyzer for emission monitoring.	No	6	-	
22	Polyurethane Foam PUF Sampler	No	6	-	
b) Optional Requirements					
1	Anemometer	Yes	-	-	available at CAAQM stations (5 Nos.- 1 No. at Royapuram, Kodungaiyur and Koyambedu, Chennai and 2 nos. at Thiruvallur
2	Weather Monitoring system	Yes	-	-	available at CAAQM stations (5 Nos.- 1 No. at Royapuram, Kodungaiyur and Koyambedu, Chennai and 2 nos. at Thiruvallur
3	Wind speed/wind direction monitor	Yes	-	-	available at CAAQM stations (5 Nos.- 1 No. at Royapuram, Kodungaiyur and Koyambedu, Chennai and 2 nos. at Thiruvallur
4	Continuous Ambient Air Monitoring System, Fixed	Yes	-	-	available at CAAQM stations (5 Nos.- 1 No. at Royapuram, Kodungaiyur and Koyambedu, Chennai and 2 nos. at Thiruvallur
5	Continuous PM10 Analyzer	Yes	-	-	available at CAAQM stations (5 Nos.- 1 No. at Royapuram, Kodungaiyur and Koyambedu, Chennai and 2 nos. at Thiruvallur
6	Continuous Ambient Air Monitoring System, Mobile	No	6	-	
7	Continuous PM2.5 analyzer	Yes	-	-	available at CAAQM stations (5 Nos.- 1 No. at Royapuram, Kodungaiyur and Koyambedu, Chennai and 2 nos. at Thiruvallur
8	Ambient Nitrogen Oxides (NO-NO2-NOx Analyzer	Yes	-	-	including Ammonia Analyser ,available at CAAQM stations (5 Nos.- 1 No. at Royapuram, Kodungaiyur and Koyambedu, Chennai and 2 nos. at Thiruvallur

9	Ambient Ozone Analyzer	Yes	-	-	available at CAAQM stations (5 Nos.- 1 No. at Royapuram, Kodungaiyur and Koyambedu, Chennai and 2 nos. at Thiruvallur
10	Ambient BTEX Analyzer	Yes	-	-	available at CAAQM stations (5 Nos.- 1 No. at Royapuram, Kodungaiyur and Koyambedu, Chennai and 2 nos. at Thiruvallur
11	Multipoint Gas Calibration system	Yes	-	-	available at CAAQM stations (5 Nos.- 1 No. at Royapuram, Kodungaiyur and Koyambedu, Chennai and 2 nos. at Thiruvallur
12	Ambient Sulphur Dioxide analyzer	Yes	-	-	available at CAAQM stations (5 Nos.- 1 No. at Royapuram, Kodungaiyur and Koyambedu, Chennai and 2 nos. at Thiruvallur
13	Ambient Carbon Monoxide & Carbon dioxide analyzer	Yes	-	-	available at CAAQM stations (5 Nos.- 1 No. at Royapuram, Kodungaiyur and Koyambedu, Chennai and 2 nos. at Thiruvallur
14	Total Hydrocarbon analyzer	No	6	-	
15	Ambient Ammonia analyzer	No	6	-	
16	Zero Gas Generator	Yes	-	-	available at CAAQM stations (5 Nos.- 1 No. at Royapuram, Kodungaiyur and Koyambedu, Chennai and 2 nos. at Thiruvallur
17	Synthetic Air Cylinder	No	6	-	
18	Calibration Gas Cylinders, SO ₂ , NO, CO, NH ₃ , benzene and Toluene One each with stainless steel Regulators	Yes	-	-	available at CAAQM stations (5 Nos.- 1 No. at Royapuram, Kodungaiyur and Koyambedu, Chennai and 2 nos. at Thiruvallur
19	Continuous emission monitoring equipment	No	6	-	
20	19 inch Rack mounting system for air analyzers	Yes	-	-	available at CAAQM stations (5 Nos.- 1 No. at Royapuram, Kodungaiyur and Koyambedu, Chennai and 2 nos. at Thiruvallur
21	Dry Gas Meter	Yes	-	-	
22	Diesel Exhaust analyzer	No	6	-	
23	Exhaust CO/HC analyzer with Sampling Probe	No	6	-	
24	Automated Noise Monitoring System	No	6	-	
25	Integrating Sound level meter	No	6	-	

26	Continuous PM10& PM2.5 Monitoring Analyzer TEOM system	Yes	-	-	available at CAAQM stations (5 Nos.- 1 No. at Royapuram, Kodungaiyur and Koyambedu, Chennai and 2 nos. at Thiruvallur,CAAQM station operates based on Beta ray attenuation)
27	Top loading orifice kit for calibration of HVS	Yes	-	-	
28	Permeation tubes (SO2, NO-NO2-NOx,NH3, BTX)	No	6	-	
C. List of Equipment required for processing of Environmental Samples:					
a) Mandatory Requirements					
1	Accelerated Solvent Extraction (ASE) System	No	6	-	
2	Ammonia distillation assembly/TKN Analyzer	Yes	-	-	
3	Analytical Balance 4/5 digit & 6 digit (Digital)	Yes	-	-	
4	Aquarium for Toxicity bioassay test with complete accessories (*4 Nos)	No	6	-	
5	Autoclave (*2 Nos)	Yes	-	-	1 No. available
6	Bacteriological Incubators Stainless steel (*2 Nos)	Yes	-	-	
7	Bio safety cabinets	Yes	-	-	
8	BOD Incubators (2 nos.)	Yes	-	-	1 No. available
9	Centrifuge	No	6	-	
10	COD Digestion heated Blocks (2) with capacity 16 nos. or more	Yes	-	-	1 No. available
11	Cyanide Distillation Assembly (3)	Yes	-	-	
12	Deep Freezer- Capacity 500 litre	Yes	-	-	180 lr available
13	Laboratory Ball Mill Grinder	No	6	-	
14	Laboratory Grinder	No	6	-	
15	Laminar Flow bench for Microbiological analysis	No	-	-	
16	Magnetic Stirrer with heating system (*2 Nos)	Yes	-	-	

17	Mechanical Shaker	No	6	-	
18	Membrane Filtration assembly with vacuum pump (2 nos.)	No	6	-	
19	Microbial culture refrigerator	No	6	-	
20	Microwave Digester with 16 vessels/ Hot Plate	Yes	-	-	Hot plate available
21	Muffle Furnace (*1 Nos), Range 1200 C	Yes	-	-	
22	Phenol distillation assembly (3)	Yes	-	-	
23	Plate counter, Manual/Automatic	No	6	-	
24	Digestion Chambers/ Fume hood	Yes	-	-	
25	Digital Thermometer & Humidity meter- All lab area	Yes	-	-	
26	Dispensers (Various capacities) up to 5, 10, 25 & 50 ml	Yes	-	-	
27	Filtration Assembly with vacuum pump	No	6	-	
28	Fluoride Distillation Assembly (3)	Yes	-	-	1 No. available
29	Arsenic / Fluoride Glass Distillation assemblies	Yes	-	-	
30	Glass Double Distillation Assembly /Water Purification System	Yes	-	-	water purification system available
31	Heating mantles (2 nos.)	Yes	-	-	
32	Hot plates (small, Medium and Large) (*2 nos.)	Yes	-	-	1 No. available
33	Thermo Hygrometer	No	6	-	
34	Imhoff Cone	No	6	-	
35	Top loading Precision Digital Balance (minimum detection 0.001mg/0.01 mg) with anti-vibration facility- 3 nos. i.e 4/5 Digit (2 nos), - 6 Digit (1 no)	Yes	-	-	
36	Refrigerators Big Size 300 litres or more, double door- 2 nos.	Yes	-	-	1 No. available

37	Rotary Evaporator (Buchi type) with water recirculating chiller	No	6	-	
38	Separating funnel shaker	No	6	-	
39	Soxhlet Apparatus	Yes	-	-	
40	Solid Phase Extraction (SPE) /SPME Extraction system	No	6	-	
41	Thermometer (Alcohol)	No	6	-	
42	Dry & wet bulb Thermometer	No	6	-	
43	Toxicity characteristic leaching procedure (TCLP) Extractors (Zero head and Bottle)	No	6	-	
44	Ultra sonic water bath- Capacity 3 litre	No	6	-	
45	Water Bath with temperature control (*2 Nos)	Yes	-	-	available without temperature control
46	Water Bath with temp. for mercury sample digestion- 20 BOD Bottles	No	6	-	
D. Analytical Instruments at Environmental Laboratories					
a) Mandatory Requirements					
1	Atomic Absorption spectrometer (AAS)- Flame, Hydride & Graphite Tube Atomizer (GTA)	Yes	-	-	
2	Binocular Stereo Zoom Microscope	No	6	-	
3	Bomb Calorimeter	No	6	-	
4	BTX Analyzer with BTX calibrator	No	6	-	
5	Colony counter	No	6	-	
6	Conductivity meter- 2 nos.	Yes	-	-	1 No. available
7	Environment conditioning chamber	Yes	-	-	
8	Digital Burettes- 50 ml*2, 100 ml*2	No	6	-	
9	Dissolved Oxygen Meter (Bench model)	Yes	-	-	
10	Flame Photometer	Yes	-	-	
11	Flash Point Apparatus	No	6	-	

12	Gas Chromatograph Mass Spectrometer	No	6	-	
13	High Performance Liquid Chromatograph (HPLC)	No	6	-	
14	Inductively Coupled Plasma (ICP) Spectrometer-OES	No	6	-	
15	Ion Chromatograph Anion & Cations	No	6	-	
16	Methane and Non Methane (NMHC) Analyzer	No	6	-	
17	Microscope – 100x	No	6	-	
18	Microscope Binocular Research	No	6	-	
19	CO (NDIR based) Analyzer	Yes	-	-	
20	Nephelometer (Turbidity Meter)	Yes	-	-	
21	pH-Meter with combined electrode (3 point)- 2 nos.	Yes	-	-	1 No. available
22	Specific ion Analyzer with ion selective electrodes	No	6	-	
23	Spectrophotometer Visible (Portable)	No	6	-	
24	TKN Analyzer semi-automatic with aluminum block digester	Yes	-	-	
25	UV-Vis Spectrophotometer	Yes	-	-	
26	Moisture Content Analyzer	No	6	-	
b) Optional Requirements					
1	Automatic Titration Assembly	No	6	-	
2	Carbon, Hydrogen, Nitrogen and Sulphur (CHNS) Elemental Analyzer	No	6	-	
3	EDXRF Analyzer/WDXRF Analyzer	No	6	-	
4	Fourier-transform infrared Spectrometer (FTIR)	No	6	-	
5	Flocculator (Jar testing apparatus)	No	6	-	
6	Toxic Gas Analyzer	No	6	-	
7	Organic Halogen (AOX/TOX) Analyzer	No	6	-	

Note: It is requested to please ensure that each sheet is created separately for each laboratory and rename the sheet accordingly . For e.g. Central Laboratory, Regional Laboratory etc

LABORATORY ANALYTICAL FACILITIES

Name of the Board / Committee: Tamil Nadu Pollution Control Board - District Environmental Laboratory (DEL), Maraimalai Nagar

PART I: Facility available for monitoring of environmental parameters:

S. No.	Parameters	Facilities Available (Yes / No)	If facility is not available, Specify Timeline for addition of this parameter. (in months)	Action Taken for addition of this parameter (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. Sample Matrix / Group of Water and Wastewater					
(a) Physical Tests					
1	Temperature	Yes	-	-	
2	Colour	Yes	-	-	
3	pH	Yes	-	-	
4	Turbidity	Yes	-	-	
5	Conductivity	Yes	-	-	
6	Total Solids	Yes	-	-	
7	Total Dissolved Solids (TDS)	Yes	-	-	
8	Total Suspended Solids (TSS)	Yes	-	-	
(b) Inorganic Tests					
(i) General & Non-metallic					
1	Alkalinity	Yes	-	-	
2	Chloride	Yes	-	-	
3	Cyanide	Yes	-	-	
4	Dissolved oxygen	Yes	-	-	
5	Nitrite nitrogen	Yes	-	-	
6	Nitrate nitrogen	Yes	-	-	
7	Ammonical nitrogen	Yes	-	-	
8	Fluoride	Yes	-	-	
9	Hardness (Total)	Yes	-	-	
10	Calcium	Yes	-	-	
11	Magnesium	Yes	-	-	

12	Phosphate	Yes	-	-			
13	Sulphate	Yes	-	-			
14	Sulphide	Yes	-	-			
15	Total Residual chlorine (TRC)	Yes	-	-			
(ii) Trace Metals Tests							
1	Aluminium (Al)	No	6	-			
2	Arsenic (As) Total	No	6	-			
3	Barium	No	6				
4	Boron	Yes	-	-			
5	Chromium (Cr) Hexavalent	Yes	-	-			
6	Chromium (Cr) Total	Yes	-	-			
7	Cadmium (Cd)	Yes	-	-			
8	Cobalt (Co)	Yes	-	-			
9	Copper (Cu)	Yes	-	-			
10	Iron (Fe)	Yes	-	-			
11	Lead (Pb)	Yes	-	-			
12	Manganese (Mn)	Yes	-	-			
13	Mercury (Hg)	Yes	-	-			
14	Nickel (Ni)	Yes	-	-			
15	Potassium (K)	Yes	-	-			
16	Sodium (Na)	Yes	-	-			
17	Vanadium (V)	No	6	-			
18	Zinc (Zn)	Yes	-	-			
19	Selenium (Se)	No	6	-			
(c) Organics (General) and Trace Organics Tests							
1	Biological Oxygen Demand (BOD)	Yes	-	-			
2	Chemical oxygen demand (COD)	Yes	-	-			
3	Oil & Grease	Yes	-	-			
4	Phenolic Compounds as C6H5OH	Yes	-	-			
5	Benzopyrene	No	6	-			
6	Pesticides						
6.a	Organochlorine Pesticides (OCPs) Tests						
i	Aldrin	No	6	-			
ii	Alpha Endosulphan	No	6	-			
iii	p,p'-DDT	No	6	-			
iv	Alpha-HCH	No	6	-			

v	Beta HCH	No	6	-	
vi	Beta Endosulphan	No	6	-	
vii	Gama-HCH	No	6	-	
viii	o,p'-DDT	No	6	-	
ix	p,p'-DDE	No	6	-	
6.b	Organophosphorus Pesticides (OPPs) Tests				
i	Malathion	No	6	-	
ii	Methyl parathion	No	6	-	
iii	Chlorpyriphos	No	6	-	
iv	Dimethoate	No	6	-	
v	Dieldrin	No	6	-	
vi	Ethion	No	6	-	
(d) Microbiological Tests					
1	Total Coliform	No	6	-	
2	Faecal Coliform	No	6	-	
3	E. Coli	No	6	-	
4	Faecal Streptococci	No	6	-	
(e) Toxicological Tests					
1	Bioassay method for evaluation of toxicity using fish (90% survival of fish after 96 hrs in 100% effluent)	No	6	-	
B. Sample Matrix / Group of Solid / Solid Waste					
(a) Soil / Sediment/Compost Tests					Facility available for Solid and sediment Tests
1	Cation Exchange Capacity (CEC)	Yes	-	-	
2	Electrical Conductivity (EC)	Yes	-	-	
3	Organic carbon (Chemical Method)	Yes	-	-	
4	pH	Yes	-	-	
5	Soil moisture	Yes	-	-	
6	Total nitrogen	Yes	-	-	
7	Metals by digestion (As, Cd, Cr, Pb, Ni etc.)	Yes	-	-	except As
(b) Hazardous Waste (Liquid / Slurry / Sludge / Solid / Semi-Solid) Tests					
1	Corrosivity	No	6	-	
2	Ignitability (Flash Point)	No	6	-	
3	Loss on Drying at 1050C (% Moisture Content)	No	6	-	
4	Loss on Drying at 5500C (% Organic Content)	No	6	-	
5	pH	No	6	-	

6	Organic carbon/matter (Chemical Method)	No	6	-			
7	Calorific Value	No	6	-			
8	Toxicity Characteristics leaching procedure (TCLP) Leachate and Metals in Leachate (As,Cd,Cr, Pb, Ni)	No	6	-			
C. Sample Matrix / Group of Analytes: Air							
(a) Ambient Air							
1	Nitrogen dioxide as NO2	Yes	-	-			
2	Sulphur dioxide (SO2)	Yes	-	-			
3	Particulate matter (PM10)	Yes	-	-			
4	Particulate matter (PM2.5)	Yes	-	-			
5	Carbon Monoxide	No	6	-			
6	Ozone	Yes	-	-			
7	Benzene	No	6	-			
8	Ammonia	Yes	-	-			
9	Metals in Particulate Matter, Pb	Yes	-	-			
10	Metals in Particulate Matter, As	Yes	-	-			
11	Metals in Particulate Matter, Ni	Yes	-	-			
12	Particulate Benzo-a-Pyrene (BaP)	No	6	-			
(b) Stack Gas / Stationary Source Emission							
1	Particulate Matter	Yes	-	-			
2	Sulphur Dioxide	Yes	-	-			
3	Carbon Dioxide	Yes	-	-			
4	Carbon Monoxide (NDIR based Method)	No	6	-			
5	Temperature	Yes	-	-			
6	Moisture	Yes	-	-			
7	Oxygen	Yes	-	-			
8	Oxides of Nitrogen	Yes	-	-			
9	Halides (HCL/HF)	Yes	-	-			
(c) Noise Level							
1	Ambient Noise level measurement (20 to 140 dB)	Yes	-	-			
2	Source Noise Level Measurement (Industrial process, DG set- 20 to 140dB)	Yes	-	-			
(d) Meteorological Monitoring							
1	Ambient Temperature	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station		

2	Wind direction	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
3	Wind speed	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
4	Relative Humidity	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
5	Mixing Height	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station

Specific remarks, if any:

PART II: Details of Laboratory Infrastructure (Instruments and Equipment)

S. No.	Name of Instrument / Equipments	Available Yes / No	If the Instrument / Equipment is not available, Specify Timeline for procurement of this instrument (in months)	Action Taken for procurement of this Instrument / Equipment (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. List of Instruments / Equipment for Sampling of Water, Wastewater and Soil / Hazardous Wastes					
a) Mandatory Requirements					
1	Portable / Pen type pH meter / pH strip	Yes	-	-	
2	Portable Dissolved Oxygen Meter / Field Fixing using chemicals	Yes	-	-	
3	Electrical Conductivity meter pen type	No	6	procurement initiated	
4	Flow meter / Physical flow measuring	No	6	-	
5	GPS / Mobile with GPS app	No	6	-	
6	Ice Box (2 nos.) (150 litre & 100 litre capacities)	Yes	-	-	
7	Thermometer	Yes	-	-	
8	Stainless steel bucket with nylon rope and mug	Yes	-	-	
9	Ground water level measuring device	No	6	-	
10	Scoop / shovel	Yes	-	-	
11	Auger / core sampler	No	6	-	
b) Optional Requirements					
1	Bottom Sampler / Depth sampler	No	6	-	
2	Chloroscope for residual chlorine	No	6	-	

3	Vandorn or equivalent water sampler (Automatic sampler when composite sampling to be done)	No	6	-			
4	Ekman Dredge	No	6	-			
B. List of Instruments / Equipment for Sampling of Ambient Air and Source Emission monitoring							
a) Mandatory Requirements							
1	Fine dust samplers PM2.5 (*4 Nos)	Yes	-	-			
2	Respirable Dust Sampler PM 10 (* 4 Nos)	Yes	-	-			
3	High Volume Sampler (SPM) (4 Nos)	Yes	-	-			
4	Handy Sampler with set of glass impingers (*2 Nos)	No	6	-			
5	Low Volume Sampler (LVS)	No	6	-			
6	Tedler bags different sizes	No	6	-			
7	Meteorological tower (All in one telescopic Mast) with sensors comprising wind speed, wind direction, ambient temp., Relative humidity, Solar radiation, rainfall etc.	Yes	-	-		available at CAAQM station (1 No.)	
8	Nitrogen Cylinder portable	No	6	-			
9	Activated Charcoal tubes/ Tenex	No	6	-			
10	Barometer (Digital)	No	6	-			
11	Isokinetic Stack Monitoring Kit complete with Stack monitoring instrument panel with inclined cum vertical manometer, Cold Box, Vacuum pump, Glass assembly impingers	Yes	-	-			
12	Modified S type Stainless steel Pitot tube (Standard length) with Assembly	Yes	-	-			
13	Monoblock type, rotary design vacuum pump	Yes	-	-			
14	Orsat Apparatus	Yes	-	-			
15	Source emission monitoring Impingers train set with spare impingers 100 ml & 225 ml capacity	Yes	-	-			
16	Stainless steel heated Sampling Probes with thimble holders short and long	Yes	-	-			
17	Flue Gas analyzer	Yes	-	-			
18	Thermometer/ Thermocouple	Yes	-	-			
19	Calibrator for Noise Meters	Yes	-	-			
20	Digital Sound level (Noise) Metres	Yes	-	-			

21	Portable TOC Analyzer for emission monitoring.	No	6	-				
22	Polyurethane Foam PUF Sampler	No	6	-				
b) Optional Requirements								
1	Anemometer	Yes	-	-	available at CAAQM station (1 No.)			
2	Weather Monitoring system	Yes	-	-	available at CAAQM station (1 No.)			
3	Wind speed/wind direction monitor	Yes	-	-	available at CAAQM station (1 No.)			
4	Continuous Ambient Air Monitoring System, Fixed	Yes	-	-	available at CAAQM station (1 No.)			
5	Continuous PM10 Analyzer	Yes	-	-	available at CAAQM station (1 No.)			
6	Continuous Ambient Air Monitoring System, Mobile	No	6	-				
7	Continuous PM2.5 analyzer	Yes	-	-	available at CAAQM station (1 No.)			
8	Ambient Nitrogen Oxides (NO-NO2-NOx Analyzer	Yes	-	-	including ammonia Analyser,available at CAAQM station (1 No.)			
9	Ambient Ozone Analyzer	Yes	-	-	available at CAAQM station (1 No.)			
10	Ambient BTEX Analyzer	Yes	-	-	available at CAAQM station (1 No.)			
11	Multipoint Gas Calibration system	Yes	-	-	available at CAAQM station (1 No.)			
12	Ambient Sulphur Dioxide analyzer	Yes	-	-	available at CAAQM station (1 No.)			
13	Ambient Carbon Monoxide & Carbon dioxide analyzer	Yes	-	-	available at CAAQM station (1 No.)			
14	Total Hydrocarbon analyzer	No	6	-				
15	Ambient Ammonia analyzer	No	6	-				
16	Zero Gas Generator	Yes	-	-	available at CAAQM station (1 No.)			
17	Synthetic Air Cylinder	No	6	-				
18	Calibration Gas Cylinders, SO2, NO, CO, NH3B ,enzene and Toluene One each with stainless steel Regulators	Yes	-	-	available at CAAQM station (1 No.)			
19	Continuous emission monitoring equipment	No	6	-				
20	19 inch Rack mounting system for air analyzers	Yes	-	-	available at CAAQM station (1 No.)			
21	Dry Gas Meter	Yes	-	-				
22	Diesel Exhaust analyzer	No	6	-				
23	Exhaust CO/HC analyzer with Sampling Probe	No	6	-				
24	Automated Noise Monitoring System	No	6	-				
25	Integrating Sound level meter	No	6	-				
26	Continuous PM10& PM2.5 Monitoring Analyzer TEOM system	Yes	-	-	available at CAAQM station (1 No.),CAAQM station operates based on Beta ray attenuation			

27	Top loading orifice kit for calibration of HVS	Yes	-	-	
28	Permeation tubes (SO ₂ , NO-NO ₂ -NO _x ,NH ₃ , BTX)	No	6	-	
C. List of Equipment required for processing of Environmental Samples:					
a) Mandatory Requirements					
1	Accelerated Solvent Extraction (ASE) System	No	6	-	
2	Ammonia distillation assembly/TKN Analyzer	Yes	-	-	
3	Analytical Balance 4/5 digit & 6 digit (Digital)	Yes	-	-	
4	Aquarium for Toxicity bioassay test with complete accessories (*4 Nos)	No	6	-	
5	Autoclave (*2 Nos)	Yes	-	-	1 No. available
6	Bacteriological Incubators Stainless steel (*2 Nos)	Yes	-	-	
7	Bio safety cabinets	Yes	-	-	
8	BOD Incubators (2 nos.)	Yes	-	-	1 No. available
9	Centrifuge	No	6	-	
10	COD Digestion heated Blocks (2) with capacity 16 nos. or more	Yes	-	-	1 No. available
11	Cyanide Distillation Assembly (3)	Yes	-	-	1 No. available
12	Deep Freezer- Capacity 500 litre	Yes	-	-	180 lr available
13	Laboratory Ball Mill Grinder	No	6	-	
14	Laboratory Grinder	No	6	-	
15	Laminar Flow bench for Microbiological analysis	No	6	-	
16	Magnetic Stirrer with heating system (*2 Nos)	Yes	-	-	
17	Mechanical Shaker	No	6	-	
18	Membrane Filtration assembly with vacuum pump (2 nos.)	No	6	-	
19	Microbial culture refrigerator	No	6	-	
20	Microwave Digester with 16 vessels/ Hot Plate	Yes	6	-	Hot plate available
21	Muffle Furnace (*1 Nos), Range 1200 C	Yes	-	-	
22	Phenol distillation assembly (3)	Yes	-	-	1 No. available
23	Plate counter, Manual/Automatic	No	6	-	

24	Digestion Chambers/ Fume hood	Yes	-	-				
25	Digital Thermometer & Humidity meter- All lab area	Yes	-	-				
26	Dispensers (Various capacities) up to 5, 10, 25 & 50 ml	Yes	-	-				
27	Filtration Assembly with vacuum pump	No	6	-				
28	Fluoride Distillation Assembly (3)	Yes	-	-	1 No. available			
29	Arsenic / Fluoride Glass Distillation assemblies	Yes	-	-				
30	Glass Double Distillation Assembly /Water Purification System	Yes	-	-	water purification system available			
31	Heating mantles (2 nos.)	Yes	-	-				
32	Hot plates (small, Medium and Large) (*2 nos.)	Yes	-	-	1 No. available			
33	Thermo Hygrometer	No	6	-				
34	Imhoff Cone	No	6	-				
35	Top loading Precision Digital Balance (minimum detection 0.001mg/0.01 mg) with anti-vibration facility- 3 nos. i.e 4/5 Digit (2 nos), - 6 Digit (1 no)	Yes	-	-				
36	Refrigerators Big Size 300 litres or more, double door- 2 nos.	Yes	-	-	1 No. available			
37	Rotary Evaporator (Buchi type) with water recirculating chiller	No	6	-				
38	Separating funnel shaker	No	6	-				
39	Soxhlet Apparatus	Yes	-	-				
40	Solid Phase Extraction (SPE) /SPME Extraction system	No	6	-				
41	Thermometer (Alcohol)	No	6	-				
42	Dry & wet bulb Thermometer	No	6	-				
43	Toxicity characteristic leaching procedure (TCLP) Extractors (Zero head and Bottle)	No	6	-				
44	Ultra sonic water bath- Capacity 3 litre	No	6	-				
45	Water Bath with temperature control (*2 Nos)	Yes	6	-	available without temperature control			
46	Water Bath with temp. for mercury sample digestion- 20 BOD Bottles	No	6	-				
D. Analytical Instruments at Environmental Laboratories								
a) Mandatory Requirements								

1	Atomic Absorption spectrometer (AAS)- Flame, Hydride & Graphite Tube Atomizer (GTA)	Yes	-	-			
2	Binocular Stereo Zoom Microscope	No	6	-			
3	Bomb Calorimeter	No	6	-			
4	BTX Analyzer with BTX calibrator	No	6	-			
5	Colony counter	No	6	-			
6	Conductivity meter- 2 nos.	Yes	-	-	1 No. available		
7	Environment conditioning chamber	yes	-	-			
8	Digital Burettes- 50 ml*2, 100 ml*2	No	6	-			
9	Dissolved Oxygen Meter (Bench model)	Yes	-	-			
10	Flame Photometer	Yes	-	-			
11	Flash Point Apparatus	No	6	-			
12	Gas Chromatograph Mass Spectrometer	No	6	-			
13	High Performance Liquid Chromatograph (HPLC)	No	6	-			
14	Inductively Coupled Plasma (ICP) Spectrometer-OES	No	6	-			
15	Ion Chromatograph Anion & Cations	No	6	-			
16	Methane and Non Methane (NMHC) Analyzer	No	6	-			
17	Microscope – 100x	No	6	-			
18	Microscope Binocular Research	No	6	-			
19	CO (NDIR based) Analyzer	Yes	-	-			
20	Nephelometer (Turbidity Meter)	Yes	-	-			
21	pH-Meter with combined electrode (3 point)- 2 nos.	Yes	-	-	1 No. available		
22	Specific ion Analyzer with ion selective electrodes	No	6	-			
23	Spectrophotometer Visible (Portable)	No	6	-			
24	TKN Analyzer semi-automatic with aluminum block digester	Yes	-	-			
25	UV-Vis Spectrophotometer	Yes	-	-			
26	Moisture Content Analyzer	No	6	-			
b) Optional Requirements							
1	Automatic Titration Assembly	No	6	-			
2	Carbon, Hydrogen, Nitrogen and Sulphur (CHNS) Elemental Analyzer	No	6	-			

Note: It is requested to please ensure that each sheet is created separately for each laboratory and rename the sheet accordingly . For e.g. Central Laboratory, Regional Laboratory etc

LABORATORY ANALYTICAL FACILITIES

Name of the Board / Committee: Tamil Nadu Pollution Control Board - District Environmental Laboratory (DEL), Nagapattinam

PART I: Facility available for monitoring of environmental parameters:

S. No.	Parameters	Facilities Available (Yes / No)	If facility is not available, Specify Timeline for addition of this parameter. (in months)	Action Taken for addition of this parameter (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. Sample Matrix / Group of Water and Wastewater					
(a) Physical Tests					
1	Temperature	Yes	-	-	
2	Colour	Yes	-	-	
3	pH	Yes	-	-	
4	Turbidity	Yes	-	-	
5	Conductivity	Yes	-	-	
6	Total Solids	Yes	-	-	
7	Total Dissolved Solids (TDS)	Yes	-	-	
8	Total Suspended Solids (TSS)	Yes	-	-	
(b) Inorganic Tests					
(i) General & Non-metallic					
1	Alkalinity	Yes	-	-	
2	Chloride	Yes	-	-	
3	Cyanide	Yes	-	-	
4	Dissolved oxygen	Yes	-	-	
5	Nitrite nitrogen	Yes	-	-	

6	Nitrate nitrogen	Yes	-	-	
7	Ammonical nitrogen	Yes	-	-	
8	Fluoride	Yes	-	-	
9	Hardness (Total)	Yes	-	-	
10	Calcium	Yes	-	-	
11	Magnesium	Yes	-	-	
12	Phosphate	Yes	-	-	
13	Sulphate	Yes	-	-	
14	Sulphide	Yes	-	-	
15	Total Residual chlorine (TRC)	Yes	-	-	
(ii) Trace Metals Tests					
1	Aluminium (Al)	No	6	-	
2	Arsenic (As) Total	No	6	-	
3	Barium	No	6	-	
4	Boron	Yes	-	-	
5	Chromium (Cr) Hexavalent	Yes	-	-	
6	Chromium (Cr) Total	Yes	-	-	
7	Cadmium (Cd)	Yes	-	-	
8	Cobalt (Co)	Yes	-	-	
9	Copper (Cu)	Yes	-	-	
10	Iron (Fe)	Yes	-	-	
11	Lead (Pb)	Yes	-	-	
12	Manganese (Mn)	Yes	-	-	
13	Mercury (Hg)	Yes	-	-	
14	Nickel (Ni)	Yes	-	-	
15	Potassium (K)	Yes	-	-	
16	Sodium (Na)	Yes	-	-	
17	Vanadium (V)	No	6	-	

18	Zinc (Zn)	Yes	-	-
19	Selenium (Se)	No	6	-
(c) Organics (General) and Trace Organics Tests				
1	Biological Oxygen Demand (BOD)	Yes	-	-
2	Chemical oxygen demand (COD)	Yes	-	-
3	Oil & Grease	Yes	-	-
4	Phenolic Compounds as C ₆ H ₅ OH	Yes	-	-
5	Benzopyrene	No	-	-
6	Pesticides			
6.a	Organochlorine Pesticides (OCPs) Tests			
i	Aldrin	No	6	-
ii	Alpha Endosulphan	No	6	-
iii	p,p'-DDT	No	6	-
iv	Alpha-HCH	No	6	-
v	Beta HCH	No	6	-
vi	Beta Endosulphan	No	6	-
vii	Gama-HCH	No	6	-
viii	o,p'-DDT	No	6	-
ix	p,p'-DDE	No	6	-
6.b	Organophosphorus Pesticides (OPPs) Tests			
i	Malathion	No	6	-
ii	Methyl parathion	No	6	-
iii	Chlorpyrifos	No	6	-
iv	Dimethoate	No	6	-
v	Dieldrin	No	6	-
vi	Ethion	No	6	-
(d) Microbiological Tests				
1	Total Coliform	No	6	-
2	Faecal Coliform	No	6	-
3	E. Coli	No	6	-
4	Faecal Streptococci	No	6	-

(e) Toxicological Tests					
1	Bioassay method for evaluation of toxicity using fish (90% survival of fish after 96 hrs in 100% effluent)	No	6	-	
B. Sample Matrix / Group of Solid / Solid Waste					
(a) Soil / Sediment/Compost Tests					Facility available for Solid and sediment Tests
1	Cation Exchange Capacity (CEC)	Yes	-	-	
2	Electrical Conductivity (EC)	Yes	-	-	
3	Organic carbon (Chemical Method)	Yes	-	-	
4	pH	Yes	-	-	
5	Soil moisture	Yes	-	-	
6	Total nitrogen	Yes	-	-	
7	Metals by digestion (As, Cd, Cr, Pb, Ni etc.)	Yes	-	-	except As
(b) Hazardous Waste (Liquid / Slurry / Sludge / Solid / Semi-Solid) Tests					
1	Corrosivity	No	6	-	
2	Ignitability (Flash Point)	No	6	-	
3	Loss on Drying at 1050C (% Moisture Content)	No	6	-	
4	Loss on Drying at 5500C (% Organic Content)	No	6	-	
5	pH	No	6	-	
6	Organic carbon/matter (Chemical Method)	No	6	-	
7	Calorific Value	No	6	-	
8	Toxicity Characteristics leaching procedure (TCLP) Leachate and Metals in Leachate (As,Cd,Cr, Pb, Ni)	No	6	-	
C. Sample Matrix / Group of Analytes: Air					
(a) Ambient Air					
1	Nitrogen dioxide as NO2	Yes	-	-	
2	Sulphur dioxide (SO2)	Yes	-	-	

3	Particulate matter (PM10)	Yes	-	-	
4	Particulate matter (PM2.5)	Yes	-	-	
5	Carbon Monoxide	No	6	-	
6	Ozone	Yes	-	-	
7	Benzene	No	6	-	
8	Ammonia	Yes	-	-	
9	Metals in Particulate Matter, Pb	Yes	-	-	
10	Metals in Particulate Matter, As	Yes	-	-	
11	Metals in Particulate Matter, Ni	Yes	-	-	
12	Particulate Benzo-a-Pyrene (BaP)	No	6	-	
(b) Stack Gas / Stationary Source Emission					
1	Particulate Matter	Yes	-	-	
2	Sulphur Dioxide	Yes	-	-	
3	Carbon Dioxide	Yes	-	-	
4	Carbon Monoxide (NDIR based Method)	No	6	-	
5	Temperature	Yes	-	-	
6	Moisture	Yes	-	-	
7	Oxygen	Yes	-	-	
8	Oxides of Nitrogen	Yes	-	-	
9	Halides (HCL/HF)	Yes	-	-	
(c) Noise Level					
1	Ambient Noise level measurement (20 to 140 dB)	Yes	-	-	
2	Source Noise Level Measurement (Industrial process, DG set- 20 to 140dB)	Yes	-	-	
(d) Meteorological Monitoring					
1	Ambient Temperature	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
2	Wind direction	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station

3	Wind speed	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
4	Relative Humidity	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
5	Mixing Height	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station

Specific remarks, if any:

PART II: Details of Laboratory Infrastructure (Instruments and Equipment)

S. No.	Name of Instrument / Equipments	Available Yes / No	If the Instrument / Equipment is not available, Specify Timeline for procurement of this instrument (in months)	Action Taken for procurement of this Instrument / Equipment (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. List of Instruments / Equipment for Sampling of Water, Wastewater and Soil / Hazardous Wastes					
a) Mandatory Requirements					
1	Portable / Pen type pH meter / pH strip	Yes	-	-	
2	Portable Dissolved Oxygen Meter / Field Fixing using chemicals	Yes	-	-	
3	Electrical Conductivity meter pen type	No	6	procurement initiated	
4	Flow meter / Physical flow measuring	No	6	-	
5	GPS / Mobile with GPS app	No	6	-	
6	Ice Box (2 nos.) (150 litre & 100 litre capacities)	Yes	-	-	
7	Thermometer	Yes	-	-	
8	Stainless steel bucket with nylon rope and mug	Yes	-	-	

9	Ground water level measuring device	No	6	-	
10	Scoop / shovel	Yes	-	-	
11	Auger / core sampler	No	6	-	
b) Optional Requirements					
1	Bottom Sampler / Depth sampler	No	6	-	
2	Chloroscope for residual chlorine	No	6	-	
3	Vandorn or equivalent water sampler (Automatic sampler when composite sampling to be done)	No	6	-	
4	Ekman Dredge	No	6	-	
B. List of Instruments / Equipment for Sampling of Ambient Air and Source Emission monitoring					
a) Mandatory Requirements					
1	Fine dust samplers PM2.5 (*4 Nos)	Yes	-	-	
2	Respirable Dust Sampler PM 10 (* 4 Nos)	Yes	-	-	
3	High Volume Sampler (SPM) (4 Nos)	Yes	-	-	
4	Handy Sampler with set of glass impingers (*2 Nos)	No	6	-	
5	Low Volume Sampler (LVS)	No	6	-	
6	Tedler bags different sizes	No	6	-	
7	Meteorological tower (All in one telescopic Mast) with sensors comprising wind speed, wind direction, ambient temp., Relative humidity, Solar radiation, rainfall etc.	Yes	-	-	available at CAAQM station (1 No.
8	Nitrogen Cylinder portable	No	6	-	
9	Activated Charcoal tubes/ Tenex	No	6	-	
10	Barometer (Digital)	No	6	-	
11	Isokinetic Stack Monitoring Kit complete with Stack monitoring instrument panel with inclined cum vertical manometer, Cold Box, Vacuum pump, Glass assembly impingers	Yes	-	-	

12	Modified S type Stainless steel Pitot tube (Standard length) with Assembly	Yes	-	-	
13	Monoblock type, rotary design vacuum pump	Yes	-	-	
14	Orsat Apparatus	Yes	-	-	
15	Source emission monitoring Impingers train set with spare impingers 100 ml & 225 ml capacity	Yes	-	-	
16	Stainless steel heated Sampling Probes with thimble holders short and long	Yes	-	-	
17	Flue Gas analyzer	Yes	-	-	
18	Thermometer/ Thermocouple	Yes	-	-	
19	Calibrator for Noise Meters	Yes	-	-	
20	Digital Sound level (Noise) Metres	Yes	-	-	
21	Portable TOC Analyzer for emission monitoring.	No	6	-	
22	Polyurethane Foam PUF Sampler	No	6	-	
b) Optional Requirements					
1	Anemometer	Yes	-	-	available at CAAQM station (1 No.)
2	Weather Monitoring system	Yes	-	-	available at CAAQM station (1 No.)
3	Wind speed/wind direction monitor	Yes	-	-	available at CAAQM station (1 No.)
4	Continuous Ambient Air Monitoring System, Fixed	Yes	-	-	available at CAAQM station (1 No.)
5	Continuous PM10 Analyzer	Yes	-	-	available at CAAQM station (1 No.)
6	Continuous Ambient Air Monitoring System, Mobile	No	6	-	
7	Continuous PM2.5 analyzer	Yes	-	-	available at CAAQM station (1 No.)
8	Ambient Nitrogen Oxides (NO-NO2-NOx Analyzer	Yes	-	-	including Ammonia Analyser,available at CAAQM station (1 No.)
9	Ambient Ozone Analyzer	Yes	-	-	available at CAAQM station (1 No.)
10	Ambient BTEX Analyzer	Yes	-	-	available at CAAQM station (1 No.)
11	Multipoint Gas Calibration system	Yes	-	-	available at CAAQM station (1 No.)
12	Ambient Sulphur Dioxide analyzer	Yes	-	-	available at CAAQM station (1 No.)

13	Ambient Carbon Monoxide & Carbon dioxide analyzer	Yes	-	-	available at CAAQM station (1 No.)
14	Total Hydrocarbon analyzer	No	6	-	
15	Ambient Ammonia analyzer	No	6	-	
16	Zero Gas Generator	Yes	-	-	available at CAAQM station (1 No.)
17	Synthetic Air Cylinder	No	6	-	
18	Calibration Gas Cylinders, SO ₂ , NO, CO, NH ₃ , Benzene and Toluene One each with stainless steel Regulators	Yes	-	-	available at CAAQM station (1 No.)
19	Continuous emission monitoring equipment	No	6	-	
20	19 inch Rack mounting system for air analyzers	Yes	-	-	available at CAAQM station (1 No.)
21	Dry Gas Meter	Yes	-	-	
22	Diesel Exhaust analyzer	No	6	-	
23	Exhaust CO/HC analyzer with Sampling Probe	No	6	-	
24	Automated Noise Monitoring System	No	6	-	
25	Integrating Sound level meter	No	6	-	
26	Continuous PM ₁₀ & PM _{2.5} Monitoring Analyzer TEOM system	Yes	-	-	available at CAAQM station (1 No.), CAAQM station operates based on Beta ray attenuation
27	Top loading orifice kit for calibration of HVS	Yes	-	-	
28	Permeation tubes (SO ₂ , NO-NO ₂ -NO _x , NH ₃ , BTX)	No	6	-	
C. List of Equipment required for processing of Environmental Samples:					
a) Mandatory Requirements					
1	Accelerated Solvent Extraction (ASE) System	No	6	-	
2	Ammonia distillation assembly/TKN Analyzer	Yes	-	-	
3	Analytical Balance 4/5 digit & 6 digit (Digital)	Yes	-	-	

4	Aquarium for Toxicity bioassay test with complete accessories (*4 Nos)	No	6	-	
5	Autoclave (*2 Nos)	Yes	-	-	1 No. available
6	Bacteriological Incubators Stainless steel (*2 Nos)	Yes	-	-	
7	Bio safety cabinets	Yes	-	-	
8	BOD Incubators (2 nos.)	Yes	-	-	1 No. available
9	Centrifuge	No	6	-	
10	COD Digestion heated Blocks (2) with capacity 16 nos. or more	Yes	-	-	1 No. available
11	Cyanide Distillation Assembly (3)	Yes	-	-	1 No. available
12	Deep Freezer- Capacity 500 litre	Yes	-	-	180 ltr available
13	Laboratory Ball Mill Grinder	No	6	-	
14	Laboratory Grinder	No	6	-	
15	Laminar Flow bench for Microbiological analysis	No	-	-	
16	Magnetic Stirrer with heating system (*2 Nos)	Yes	-	-	
17	Mechanical Shaker	No	6	-	
18	Membrane Filtration assembly with vacuum pump (2 nos.)	No	6	-	
19	Microbial culture refrigerator	No	6	-	
20	Microwave Digester with 16 vessels/ Hot Plate	Yes	-	-	Hot plate available
21	Muffle Furnace (*1 Nos), Range 1200 C	Yes	-	-	
22	Phenol distillation assembly (3)	Yes	-	-	1 No. available
23	Plate counter, Manual/Automatic	No	6	-	
24	Digestion Chambers/ Fume hood	Yes	-	-	
25	Digital Thermometer & Humidity meter- All lab area	Yes	-	-	
26	Dispensers (Various capacities) up to 5, 10, 25 & 50 ml	Yes	-	-	

27	Filtration Assembly with vacuum pump	No	6	-	
28	Fluoride Distillation Assembly (3)	Yes		-	1 No. available
29	Arsenic / Fluoride Glass Distillation assemblies	Yes	-	-	
30	Glass Double Distillation Assembly /Water Purification System	Yes	-	-	Waer Purification system available
31	Heating mantles (2 nos.)	Yes	-	-	
32	Hot plates (small, Medium and Large) (*2 nos.)	Yes	-	-	1 No. available
33	Thermo Hygrometer	No	6	-	
34	Imhoff Cone	No	6	-	
35	Top loading Precision Digital Balance (minimum detection 0.001mg/0.01 mg) with anti-vibration facility- 3 nos. i.e 4/5 Digit (2 nos), - 6 Digit (1 no)	Yes	-	-	
36	Refrigerators Big Size 300 litres or more, double door- 2 nos.	Yes	-	-	1 No. available
37	Rotary Evaporator (Buchi type) with water recirculating chiller	No	6	-	
38	Separating funnel shaker	No	6	-	
39	Soxhlet Apparatus	Yes	-	-	
40	Solid Phase Extraction (SPE) /SPME Extraction system	No	6	-	
41	Thermometer (Alcohol)	No	6	-	
42	Dry & wet bulb Thermometer	No	6	-	
43	Toxicity characteristic leaching procedure (TCLP) Extractors (Zero head and Bottle)	No	6	-	
44	Ultra sonic water bath- Capacity 3 litre	No	6	-	
45	Water Bath with temperature control (*2 Nos)	Yes	-	-	available without temperature control
46	Water Bath with temp. for mercury sample digestion- 20 BOD Bottles	No	6	-	

D. Analytical Instruments at Environmental Laboratories					
a) Mandatory Requirements					
1	Atomic Absorption spectrometer (AAS)- Flame, Hydride & Graphite Tube Atomizer (GTA)	Yes	-	-	
2	Binocular Stereo Zoom Microscope	No	6	-	
3	Bomb Calorimeter	No	6	-	
4	BTX Analyzer with BTX calibrator	No	6	-	
5	Colony counter	No	6	-	
6	Conductivity meter- 2 nos.	Yes	-	-	1 No. available
7	Environment conditioning chamber	yes	-	-	
8	Digital Burettes- 50 ml*2, 100 ml*2	No	6	-	
9	Dissolved Oxygen Meter (Bench model)	Yes	-	-	
10	Flame Photometer	Yes	-	-	
11	Flash Point Apparatus	No	6	-	
12	Gas Chromatograph Mass Spectrometer	No	6	-	
13	High Performance Liquid Chromatograph (HPLC)	No	6	-	
14	Inductively Coupled Plasma (ICP) Spectrometer-OES	No	6	-	
15	Ion Chromatograph Anion & Cations	No	6	-	
16	Methane and Non Methane (NMHC) Analyzer	No	6	-	
17	Microscope – 100x	No	6	-	
18	Microscope Binocular Research	No	6	-	
19	CO (NDIR based) Analyzer	Yes	-	-	
20	Nephelometer (Turbidity Meter)	Yes	-	-	
21	pH-Meter with combined electrode (3 point)- 2 nos.	Yes	-	-	1 No. available
22	Specific ion Analyzer with ion selective electrodes	No	6	-	

23	Spectrophotometer Visible (Portable)	No	6	-	
24	TKN Analyzer semi-automatic with aluminum block digester	Yes	-	-	
25	UV-Vis Spectrophotometer	Yes	-	-	
26	Moisture Content Analyzer	No	6	-	
b) Optional Requirements					
1	Automatic Titration Assembly	No	6	-	
2	Carbon, Hydrogen, Nitrogen and Sulphur (CHNS) Elemental Analyzer	No	6	-	
3	EDXRF Analyzer/WDXRF Analyzer	No	6	-	
4	Fourier-transform infrared Spectrometer (FTIR)	No	6	-	
5	Flocculator (Jar testing apparatus)	No	6	-	
6	Toxic Gas Analyzer	No	6	-	
7	Organic Halogen (AOX/TOX) Analyzer	No	6	-	
8	TOC Analyzer	No	6	-	
9	High Resolution Mass Spectrometer (HRGC-HRMS)	No	6	-	
10	Inductively Coupled Plasma Mass (ICP-MS) Spectrometer	No	6	-	
11	X Ray Fluorescence (XRF) Spectrometer (Portable)	No	6	-	
Specific remarks, if any:					

Note: It is requested to please ensure that each sheet is created separately for each laboratory and rename the sheet accordingly . For e.g. Central Laboratory, Regional Laboratory etc

LABORATORY ANALYTICAL FACILITIES

Name of the Board / Committee: Tamil Nadu Pollution Control Board - District Environmental Laboratory (DEL), Oragadam

PART I: Facility available for monitoring of environmental parameters:

S. No.	Parameters	Facilities Available (Yes / No)	If facility is not available, Specify Timeline for addition of this parameter. (in months)	Action Taken for addition of this parameter (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. Sample Matrix / Group of Water and Wastewater					
(a) Physical Tests					
1	Temperature	Yes	-	-	
2	Colour	Yes	-	-	
3	pH	Yes	-	-	
4	Turbidity	Yes	-	-	
5	Conductivity	Yes	-	-	
6	Total Solids	Yes	-	-	
7	Total Dissolved Solids (TDS)	Yes	-	-	
8	Total Suspended Solids (TSS)	Yes	-	-	
(b) Inorganic Tests					
(i) General & Non-metallic					
1	Alkalinity	Yes	-	-	
2	Chloride	Yes	-	-	
3	Cyanide	Yes	-	-	
4	Dissolved oxygen	Yes	-	-	

5	Nitrite nitrogen	Yes	-	-	
6	Nitrate nitrogen	Yes	-	-	
7	Ammonical nitrogen	Yes	-	-	
8	Fluoride	Yes	-	-	
9	Hardness (Total)	Yes	-	-	
10	Calcium	Yes	-	-	
11	Magnesium	Yes	-	-	
12	Phosphate	Yes	-	-	
13	Sulphate	Yes	-	-	
14	Sulphide	Yes	-	-	
15	Total Residual chlorine (TRC)	Yes	-	-	
(ii) Trace Metals Tests					
1	Aluminium (Al)	No	6	-	
2	Arsenic (As) Total	No	6	-	
3	Barium	No	6	-	
4	Boron	Yes	-	-	
5	Chromium (Cr) Hexavalent	Yes	-	-	
6	Chromium (Cr) Total	Yes	-	-	
7	Cadmium (Cd)	Yes	-	-	
8	Cobalt (Co)	Yes	-	-	
9	Copper (Cu)	Yes	-	-	
10	Iron (Fe)	Yes	-	-	
11	Lead (Pb)	Yes	-	-	
12	Manganese (Mn)	Yes	-	-	
13	Mercury (Hg)	Yes	-	-	
14	Nickel (Ni)	Yes	-	-	
15	Potassium (K)	Yes	-	-	
16	Sodium (Na)	Yes	-	-	

17	Vanadium (V)	No	6	-	
18	Zinc (Zn)	Yes	-	-	
19	Selenium (Se)	No	6	-	
(c) Organics (General) and Trace Organics Tests					
1	Biological Oxygen Demand (BOD)	Yes	-	-	
2	Chemical oxygen demand (COD)	Yes	-	-	
3	Oil & Grease	Yes	-	-	
4	Phenolic Compounds as C6H5OH	Yes	-	-	
5	Benzopyrene	No	6	-	
6	Pesticides				
6.a	Organochlorine Pesticides (OCPs) Tests				
i	Aldrin	No	6	-	
ii	Alpha Endosulphan	No	6	-	
iii	p,p'-DDT	No	6	-	
iv	Alpha-HCH	No	6	-	
v	Beta HCH	No	6	-	
vi	Beta Endosulphan	No	6	-	
vii	Gama-HCH	No	6	-	
viii	o,p'-DDT	No	6	-	
ix	p,p'-DDE	No	6	-	
6.b	Organophosphorus Pesticides (OPPs) Tests				
i	Malathion	No	6	-	
ii	Methyl parathion	No	6	-	
iii	Chlorpyriphos	No	6	-	
iv	Dimethoate	No	6	-	
v	Dieldrin	No	6	-	
vi	Ethion	No	6	-	
(d) Microbiological Tests					
1	Total Coliform	No	6	-	
2	Faecal Coliform	No	6	-	

3	E. Coli	No	6	-	
4	Faecal Streptococci	No	6	-	
(e) Toxicological Tests					
1	Bioassay method for evaluation of toxicity using fish (90% survival of fish after 96 hrs in 100% effluent)	No	6	-	
B. Sample Matrix / Group of Solid / Solid Waste					
(a) Soil / Sediment/Compost Tests					
					Facility available for Solid and sediment Tests
1	Cation Exchange Capacity (CEC)	Yes	-	-	
2	Electrical Conductivity (EC)	Yes	-	-	
3	Organic carbon (Chemical Method)	Yes	-	-	
4	pH	Yes	-	-	
5	Soil moisture	Yes	-	-	
6	Total nitrogen	Yes	-	-	
7	Metals by digestion (As, Cd, Cr, Pb, Ni etc.)	Yes	-	-	except As
(b) Hazardous Waste (Liquid / Slurry / Sludge / Solid / Semi-Solid) Tests					
1	Corrosivity	No	6	-	
2	Ignitability (Flash Point)	No	6	-	
3	Loss on Drying at 1050C (% Moisture Content)	No	6	-	
4	Loss on Drying at 5500C (% Organic Content)	No	6	-	
5	pH	No	6	-	
6	Organic carbon/matter (Chemical Method)	No	6	-	
7	Calorific Value	No	6	-	
8	Toxicity Characteristics leaching procedure (TCLP) Leachate and Metals in Leachate (As,Cd,Cr, Pb, Ni)	No	6	-	
C. Sample Matrix / Group of Analytes: Air					
(a) Ambient Air					

1	Nitrogen dioxide as NO2	Yes	-	-	
2	Sulphur dioxide (SO2)	Yes	-	-	
3	Particulate matter (PM10)	Yes	-	-	
4	Particulate matter (PM2.5)	Yes	-	-	
5	Carbon Monoxide	No	6	-	
6	Ozone	Yes	-	-	
7	Benzene	No	6	-	
8	Ammonia	Yes	-	-	
9	Metals in Particulate Matter, Pb	Yes	-	-	
10	Metals in Particulate Matter, As	Yes	-	-	
11	Metals in Particulate Matter, Ni	Yes	-	-	
12	Particulate Benzo-a-Pyrene (BaP)	No	6	-	
(b) Stack Gas / Stationary Source Emission					
1	Particulate Matter	Yes	-	-	
2	Sulphur Dioxide	Yes	-	-	
3	Carbon Dioxide	Yes	-	-	
4	Carbon Monoxide (NDIR based Method)	No	6	-	
5	Temperature	Yes	-	-	
6	Moisture	Yes	-	-	
7	Oxygen	Yes	-	-	
8	Oxides of Nitrogen	Yes	-	-	
9	Halides (HCL/HF)	Yes	-	-	
(c) Noise Level					
1	Ambient Noise level measurement (20 to 140 dB)	Yes	-	-	
2	Source Noise Level Measurement (Industrial process, DG set- 20 to 140dB)	Yes	-	-	
(d) Meteorological Monitoring					
1	Ambient Temperature	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station

2	Wind direction	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
3	Wind speed	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
4	Relative Humidity	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
5	Mixing Height	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station

Specific remarks, if any:

PART II: Details of Laboratory Infrastructure (Instruments and Equipment)

S. No.	Name of Instrument / Equipments	Available Yes / No	If the Instrument / Equipment is not available, Specify Timeline for procurement of this instrument (in months)	Action Taken for procurement of this Instrument / Equipment (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. List of Instruments / Equipment for Sampling of Water, Wastewater and Soil / Hazardous Wastes					
a) Mandatory Requirements					
1	Portable / Pen type pH meter / pH strip	Yes	-	-	
2	Portable Dissolved Oxygen Meter / Field Fixing using chemicals	Yes	-	-	
3	Electrical Conductivity meter pen type	No	6	procurement initiated	
4	Flow meter / Physical flow measuring	No	6	will be initiated	
5	GPS / Mobile with GPS app	No	6	will be initiated	
6	Ice Box (2 nos.) (150 litre & 100 litre capacities)	Yes	-	-	
7	Thermometer	Yes	-	-	

8	Stainless steel bucket with nylon rope and mug	Yes	-	-	
9	Ground water level measuring device	No	6	-	
10	Scoop / shovel	Yes	-	-	
11	Auger / core sampler	No	6	-	
b) Optional Requirements					
1	Bottom Sampler / Depth sampler	No	6	-	
2	Chloroscope for residual chlorine	No	6	-	
3	Vandorn or equivalent water sampler (Automatic sampler when composite sampling to be done)	No	6	-	
4	Ekman Dredge	No	6	-	
B. List of Instruments / Equipment for Sampling of Ambient Air and Source Emission monitoring					
a) Mandatory Requirements					
1	Fine dust samplers PM2.5 (*4 Nos)	Yes	-	-	
2	Respirable Dust Sampler PM 10 (* 4 Nos)	Yes	-	-	
3	High Volume Sampler (SPM) (4 Nos)	Yes	-	-	
4	Handy Sampler with set of glass impingers (*2 Nos)	No	6	-	
5	Low Volume Sampler (LVS)	No	6	-	
6	Tedler bags different sizes	No	6	-	
7	Meteorological tower (All in one telescopic Mast) with sensors comprising wind speed, wind direction, ambient temp., Relative humidity, Solar radiation, rainfall etc.	Yes	-	-	available at CAAQM station (1 No.)
8	Nitrogen Cylinder portable	No	6	-	
9	Activated Charcoal tubes/ Tenex	No	6	-	
10	Barometer (Digital)	No	6	-	

11	Isokinetic Stack Monitoring Kit complete with Stack monitoring instrument panel with inclined cum vertical manometer, Cold Box, Vacuum pump, Glass assembly impingers	Yes	-	-	
12	Modified S type Stainless steel Pitot tube (Standard length) with Assembly	Yes	-	-	
13	Monoblock type, rotary design vacuum pump	Yes	-	-	
14	Orsat Apparatus	Yes	-	-	
15	Source emission monitoring Impingers train set with spare impingers 100 ml & 225 ml capacity	Yes	-	-	
16	Stainless steel heated Sampling Probes with thimble holders short and long	Yes	-	-	
17	Flue Gas analyzer	Yes	-	-	
18	Thermometer/ Thermocouple	Yes	-	-	
19	Calibrator for Noise Meters	Yes	-	-	
20	Digital Sound level (Noise) Metres	Yes	-	-	
21	Portable TOC Analyzer for emission monitoring.	No	6	-	
22	Polyurethane Foam PUF Sampler	No	6	-	
b) Optional Requirements					
1	Anemometer	Yes	-	-	available at CAAQM station (1 No.)
2	Weather Monitoring system	Yes	-	-	available at CAAQM station (1 No.)
3	Wind speed/wind direction monitor	Yes	-	-	available at CAAQM station (1 No.)
4	Continuous Ambient Air Monitoring System, Fixed	Yes	-	-	available at CAAQM station (1 No.)
5	Continuous PM10 Analyzer	Yes	-	-	available at CAAQM station (1 No.)
6	Continuous Ambient Air Monitoring System, Mobile	No	6	-	
7	Continuous PM2.5 analyzer	Yes	-	-	available at CAAQM station (1 No.)

8	Ambient Nitrogen Oxides (NO-NO ₂ -NO _x Analyzer	Yes	-	-	including Ammonia Analyser, available at CAAQM station (1 No.)
9	Ambient Ozone Analyzer	Yes	-	-	available at CAAQM station (1 No.)
10	Ambient BTEX Analyzer	Yes	-	-	available at CAAQM station (1 No.)
11	Multipoint Gas Calibration system	Yes	-	-	available at CAAQM station (1 No.)
12	Ambient Sulphur Dioxide analyzer	Yes	-	-	available at CAAQM station (1 No.)
13	Ambient Carbon Monoxide & Carbon dioxide analyzer	Yes	-	-	available at CAAQM station (1 No.)
14	Total Hydrocarbon analyzer	No	6	-	
15	Ambient Ammonia analyzer	No	6	-	
16	Zero Gas Generator	Yes	-	-	available at CAAQM station (1 No.)
17	Synthetic Air Cylinder	No	6	-	
18	Calibration Gas Cylinders, SO ₂ , NO, CO, NH ₃ , Benzene and Toluene One each with stainless steel Regulators	Yes	-	-	available at CAAQM station (1 No.)
19	Continuous emission monitoring equipment	No	6	-	
20	19 inch Rack mounting system for air analyzers	Yes	-	-	available at CAAQM station (1 No.)
21	Dry Gas Meter	Yes	-	-	
22	Diesel Exhaust analyzer	No	6	-	
23	Exhaust CO/HC analyzer with Sampling Probe	No	6	-	
24	Automated Noise Monitoring System	No	6	-	
25	Integrating Sound level meter	No	6	-	
26	Continuous PM ₁₀ & PM _{2.5} Monitoring Analyzer TEOM system	Yes	-	-	available at CAAQM station (1 No.), CAAQM station operates based on Beta ray attenuation
27	Top loading orifice kit for calibration of HVS	Yes	-	-	
28	Permeation tubes (SO ₂ , NO-NO ₂ -NO _x , NH ₃ , BTX)	No	6	-	

C. List of Equipment required for processing of Environmental Samples:

a) Mandatory Requirements

1	Accelerated Solvent Extraction (ASE) System	No	6	-	
2	Ammonia distillation assembly/TKN Analyzer	Yes	-	-	
3	Analytical Balance 4/5 digit & 6 digit (Digital)	Yes	-	-	
4	Aquarium for Toxicity bioassay test with complete accessories (*4 Nos)	No	6	-	
5	Autoclave (*2 Nos)	Yes	-	-	1 No. available
6	Bacteriological Incubators Stainless steel (*2 Nos)	Yes	-	-	
7	Bio safety cabinets	Yes	-	-	
8	BOD Incubators (2 nos.)	Yes	-	-	1 No. available
9	Centrifuge	No	6	-	
10	COD Digestion heated Blocks (2) with capacity 16 nos. or more	Yes	-	-	1 No. available
11	Cyanide Distillation Assembly (3)	Yes	-	-	1 No. available
12	Deep Freezer- Capacity 500 litre	Yes	-	-	180 lr available
13	Laboratory Ball Mill Grinder	No	6	-	
14	Laboratory Grinder	No	6	-	
15	Laminar Flow bench for Microbiological analysis	No	6	-	
16	Magnetic Stirrer with heating system (*2 Nos)	Yes	-	-	
17	Mechanical Shaker	No	6	-	
18	Membrane Filtration assembly with vacuum pump (2 nos.)	No	6	-	
19	Microbial culture refrigerator	No	6	-	
20	Microwave Digester with 16 vessels/ Hot Plate	Yes	-	-	Hot plate available
21	Muffle Furnace (*1 Nos), Range 1200 C	Yes	-	-	
22	Phenol distillation assembly (3)	Yes	-	-	1 No. available

23	Plate counter, Manual/Automatic	No	6	-	
24	Digestion Chambers/ Fume hood	Yes	-	-	
25	Digital Thermometer & Humidity meter- All lab area	Yes	-	-	
26	Dispensers (Various capacities) up to 5, 10, 25 & 50 ml	Yes	-	-	
27	Filtration Assembly with vacuum pump	No	6	-	
28	Fluoride Distillation Assembly (3)	Yes	-	-	1 No. available
29	Arsenic / Fluoride Glass Distillation assemblies	Yes	-	-	
30	Glass Double Distillation Assembly /Water Purification System	Yes	-	-	water purification system available
31	Heating mantles (2 nos.)	Yes	-	-	
32	Hot plates (small, Medium and Large) (*2 nos.)	Yes	-	-	1 No. available
33	Thermo Hygrometer	No	6	-	
34	Imhoff Cone	No	6	-	
35	Top loading Precision Digital Balance (minimum detection 0.001mg/0.01 mg) with anti-vibration facility- 3 nos. i.e 4/5 Digit (2 nos), - 6 Digit (1 no)	Yes	-	-	
36	Refrigerators Big Size 300 litres or more, double door- 2 nos.	Yes	-	-	1 No. available
37	Rotary Evaporator (Buchi type) with water recirculating chiller	No	6	-	
38	Separating funnel shaker	No	6	-	
39	Soxhlet Apparatus	Yes	-	-	
40	Solid Phase Extraction (SPE) /SPME Extraction system	No	6	-	
41	Thermometer (Alcohol)	No	6	-	
42	Dry & wet bulb Thermometer	No	6	-	

43	Toxicity characteristic leaching procedure (TCLP) Extractors (Zero head and Bottle)	No	6	-	
44	Ultra sonic water bath- Capacity 3 litre	No	6	-	
45	Water Bath with temperature control (*2 Nos)	Yes	-	-	available without temperature control
46	Water Bath with temp. for mercury sample digestion- 20 BOD Bottles	No	6	-	
D. Analytical Instruments at Environmental Laboratories					
a) Mandatory Requirements					
1	Atomic Absorption spectrometer (AAS)- Flame, Hydride & Graphite Tube Atomizer (GTA)	Yes	-	-	
2	Binocular Stereo Zoom Microscope	No	6	-	
3	Bomb Calorimeter	No	6	-	
4	BTX Analyzer with BTX calibrator	No	6	-	
5	Colony counter	No	6	-	
6	Conductivity meter- 2 nos.	Yes	-	-	1 No. available
7	Environment conditioning chamber	Yes	-	-	
8	Digital Burettes- 50 ml*2, 100 ml*2	No	6	-	
9	Dissolved Oxygen Meter (Bench model)	Yes	-	-	
10	Flame Photometer	Yes	-	-	
11	Flash Point Apparatus	No	6	-	
12	Gas Chromatograph Mass Spectrometer	No	6	-	
13	High Performance Liquid Chromatograph (HPLC)	No	6	-	
14	Inductively Coupled Plasma (ICP) Spectrometer-OES	No	6	-	
15	Ion Chromatograph Anion & Cations	No	6	-	
16	Methane and Non Methane (NMHC) Analyzer	No	6	-	

17	Microscope – 100x	No	6	-	
18	Microscope Binocular Research	No	6	-	
19	CO (NDIR based) Analyzer	Yes	-	-	
20	Nephelometer (Turbidity Meter)	Yes	-	-	
21	pH-Meter with combined electrode (3 point)- 2 nos.	Yes	-	-	1 No. available
22	Specific ion Analyzer with ion selective electrodes	No	6	-	
23	Spectrophotometer Visible (Portable)	No	6	-	
24	TKN Analyzer semi-automatic with aluminum block digester	Yes	-	-	
25	UV-Vis Spectrophotometer	Yes	-	-	
26	Moisture Content Analyzer	No	6	-	
b) Optional Requirements					
1	Automatic Titration Assembly	No	6	-	
2	Carbon, Hydrogen, Nitrogen and Sulphur (CHNS) Elemental Analyzer	No	6	-	
3	EDXRF Analyzer/WDXRF Analyzer	No	6	-	
4	Fourier-transform infrared Spectrometer (FTIR)	No	6	-	
5	Flocculator (Jar testing apparatus)	No	6	-	
6	Toxic Gas Analyzer	No	6	-	
7	Organic Halogen (AOX/TOX) Analyzer	No	6	-	
8	TOC Analyzer	No	6	-	
9	High Resolution Mass Spectrometer (HRGC-HRMS)	No	6	-	
10	Inductively Coupled Plasma Mass (ICP-MS) Spectrometer	No	6	-	
11	X Ray Fluorescence (XRF) Spectrometer (Portable)	No	6	-	

Specific remarks, if any:					

Note: It is requested to please ensure that each sheet is created separately for each laboratory and rename the sheet accordingly . For e.g. Central Laboratory, Regional Laboratory etc

LABORATORY ANALYTICAL FACILITIES

Name of the Board / Committee: Tamil Nadu Pollution Control Board - District Environmental Laboratory (DEL), Perundurai

PART I: Facility available for monitoring of environmental parameters:

S. No.	Parameters	Facilities Available (Yes / No)	If facility is not available, Specify Timeline for addition of this parameter. (in months)	Action Taken for addition of this parameter (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. Sample Matrix / Group of Water and Wastewater					
(a) Physical Tests					
1	Temperature	Yes	-	-	
2	Colour	Yes	-	-	
3	pH	Yes	-	-	
4	Turbidity	Yes	-	-	
5	Conductivity	Yes	-	-	
6	Total Solids	Yes	-	-	
7	Total Dissolved Solids (TDS)	Yes	-	-	
8	Total Suspended Solids (TSS)	Yes	-	-	
(b) Inorganic Tests					
(i) General & Non-metallic					
1	Alkalinity	Yes	-	-	
2	Chloride	Yes	-	-	
3	Cyanide	Yes	-	-	
4	Dissolved oxygen	Yes	-	-	

5	Nitrite nitrogen	Yes	-	-	
6	Nitrate nitrogen	Yes	-	-	
7	Ammonical nitrogen	Yes	-	-	
8	Fluoride	Yes	-	-	
9	Hardness (Total)	Yes	-	-	
10	Calcium	Yes	-	-	
11	Magnesium	Yes	-	-	
12	Phosphate	Yes	-	-	
13	Sulphate	Yes	-	-	
14	Sulphide	Yes	-	-	
15	Total Residual chlorine (TRC)	Yes	-	-	
(ii) Trace Metals Tests					
1	Aluminium (Al)	No	6	-	
2	Arsenic (As) Total	No	6	-	
3	Barium	No	6	-	
4	Boron	Yes	-	-	
5	Chromium (Cr) Hexavalent	Yes	-	-	
6	Chromium (Cr) Total	Yes	-	-	
7	Cadmium (Cd)	Yes	-	-	
8	Cobalt (Co)	Yes	-	-	
9	Copper (Cu)	Yes	-	-	
10	Iron (Fe)	Yes	-	-	
11	Lead (Pb)	Yes	-	-	
12	Manganese (Mn)	Yes	-	-	
13	Mercury (Hg)	Yes	-	-	
14	Nickel (Ni)	Yes	-	-	
15	Potassium (K)	Yes	-	-	

16	Sodium (Na)	Yes	-	-
17	Vanadium (V)	No	6	-
18	Zinc (Zn)	Yes	-	-
19	Selenium (Se)	No	6	-
(c) Organics (General) and Trace Organics Tests				
1	Biological Oxygen Demand (BOD)	Yes	-	-
2	Chemical oxygen demand (COD)	Yes	-	-
3	Oil & Grease	Yes	-	-
4	Phenolic Compounds as C ₆ H ₅ OH	Yes	-	-
5	Benzopyrene	No	6	-
6	Pesticides			
6.a	Organochlorine Pesticides (OCPs) Tests			
i	Aldrin	No	6	-
ii	Alpha Endosulphan	No	6	-
iii	p,p'-DDT	No	6	-
iv	Alpha-HCH	No	6	-
v	Beta HCH	No	6	-
vi	Beta Endosulphan	No	6	-
vii	Gama-HCH	No	6	-
viii	o,p'-DDT	No	6	-
ix	p,p'-DDE	No	6	-
6.b	Organophosphorus Pesticides (OPPs) Tests			
i	Malathion	No	6	-
ii	Methyl parathion	No	6	-
iii	Chlorpyriphos	No	6	-
iv	Dimethoate	No	6	-
v	Dieldrin	No	6	-
vi	Ethion	No	6	-
(d) Microbiological Tests				
1	Total Coliform	No	6	-

2	Faecal Coliform	No	6	-	
3	E. Coli	No	6	-	
4	Faecal Streptococci	No	6	-	
(e) Toxicological Tests					
1	Bioassay method for evaluation of toxicity using fish (90% survival of fish after 96 hrs in 100% effluent)	No	6	-	
B. Sample Matrix / Group of Solid / Solid Waste					
(a) Soil / Sediment/Compost Tests					Facility available for Solid and sediment Tests
1	Cation Exchange Capacity (CEC)	Yes	-	-	
2	Electrical Conductivity (EC)	Yes	-	-	
3	Organic carbon (Chemical Method)	Yes	-	-	
4	pH	Yes	-	-	
5	Soil moisture	Yes	-	-	
6	Total nitrogen	Yes	-	-	
7	Metals by digestion (As, Cd, Cr, Pb, Ni etc.)	Yes	-	-	except As
(b) Hazardous Waste (Liquid / Slurry / Sludge / Solid / Semi-Solid) Tests					
1	Corrosivity	No	6	-	
2	Ignitability (Flash Point)	No	6	-	
3	Loss on Drying at 1050C (% Moisture Content)	No	6	-	
4	Loss on Drying at 5500C (% Organic Content)	No	6	-	
5	pH	No	6	-	
6	Organic carbon/matter (Chemical Method)	No	6	-	
7	Calorific Value	No	6	-	
8	Toxicity Characteristics leaching procedure (TCLP) Leachate and Metals in Leachate (As,Cd,Cr, Pb, Ni)	No	6	-	
C. Sample Matrix / Group of Analytes: Air					

(a) Ambient Air					
1	Nitrogen dioxide as NO2	Yes	-	-	
2	Sulphur dioxide (SO2)	Yes	-	-	
3	Particulate matter (PM10)	Yes	-	-	
4	Particulate matter (PM2.5)	Yes	-	-	
5	Carbon Monoxide	No	6	-	
6	Ozone	Yes	-	-	
7	Benzene	No	6	-	
8	Ammonia	Yes	-	-	
9	Metals in Particulate Matter, Pb	Yes	-	-	
10	Metals in Particulate Matter, As	Yes	-	-	
11	Metals in Particulate Matter, Ni	Yes	-	-	
12	Particulate Benzo-a-Pyrene (BaP)	No	6	-	
(b) Stack Gas / Stationary Source Emission					
1	Particulate Matter	Yes	-	-	
2	Sulphur Dioxide	Yes	-	-	
3	Carbon Dioxide	Yes	-	-	
4	Carbon Monoxide (NDIR based Method)	No	6	-	
5	Temperature	Yes	-	-	
6	Moisture	Yes	-	-	
7	Oxygen	Yes	-	-	
8	Oxides of Nitrogen	Yes	-	-	
9	Halides (HCL/HF)	Yes	-	-	
(c) Noise Level					
1	Ambient Noise level measurement (20 to 140 dB)	Yes	-	-	
2	Source Noise Level Measurement (Industrial process, DG set- 20 to 140dB)	Yes	-	-	
(d) Meteorological Monitoring					

1	Ambient Temperature	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
2	Wind direction	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
3	Wind speed	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
4	Relative Humidity	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
5	Mixing Height	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station

Specific remarks, if any:

PART II: Details of Laboratory Infrastructure (Instruments and Equipment)

S. No.	Name of Instrument / Equipments	Available Yes / No	If the Instrument / Equipment is not available, Specify Timeline for procurement of this instrument (in months)	Action Taken for procurement of this Instrument / Equipment (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. List of Instruments / Equipment for Sampling of Water, Wastewater and Soil / Hazardous Wastes					
a) Mandatory Requirements					
1	Portable / Pen type pH meter / pH strip	Yes	-	-	
2	Portable Dissolved Oxygen Meter / Field Fixing using chemicals	Yes	-	-	
3	Electrical Conductivity meter pen type	No	6	procurement initiated	
4	Flow meter / Physical flow measuring	No	6	-	
5	GPS / Mobile with GPS app	No	6	-	

6	Ice Box (2 nos.) (150 litre & 100 litre capacities)	Yes	-	-	
7	Thermometer	Yes	-	-	
8	Stainless steel bucket with nylon rope and mug	Yes	-	-	
9	Ground water level measuring device	No	6	-	
10	Scoop / shovel	Yes	-	-	
11	Auger / core sampler	No	6	-	
b) Optional Requirements					
1	Bottom Sampler / Depth sampler	No	6	-	
2	Chloroscope for residual chlorine	No	6	-	
3	Vandorn or equivalent water sampler (Automatic sampler when composite sampling to be done)	No	6	-	
4	Ekman Dredge	No	6	-	
B. List of Instruments / Equipment for Sampling of Ambient Air and Source Emission monitoring					
a) Mandatory Requirements					
1	Fine dust samplers PM2.5 (*4 Nos)	Yes	-	-	
2	Respirable Dust Sampler PM 10 (* 4 Nos)	Yes	-	-	
3	High Volume Sampler (SPM) (4 Nos)	Yes	-	-	
4	Handy Sampler with set of glass impingers (*2 Nos)	No	6	-	
5	Low Volume Sampler (LVS)	No	6	-	
6	Tedler bags different sizes	No	6	-	
7	Meteorological tower (All in one telescopic Mast) with sensors comprising wind speed, wind direction, ambient temp., Relative humidity, Solar radiation, rainfall etc.	Yes	-	-	available at CAAQM station (1 No.)
8	Nitrogen Cylinder portable	No	6	-	
9	Activated Charcoal tubes/ Tenex	No	6	-	

10	Barometer (Digital)	No	6	-	
11	Isokinetic Stack Monitoring Kit complete with Stack monitoring instrument panel with inclined cum vertical manometer, Cold Box, Vacuum pump, Glass assembly impingers	Yes	-	-	
12	Modified S type Stainless steel Pitot tube (Standard length) with Assembly	Yes	-	-	
13	Monoblock type, rotary design vacuum pump	Yes	-	-	
14	Orsat Apparatus	Yes	-	-	
15	Source emission monitoring Impingers train set with spare impingers 100 ml & 225 ml capacity	Yes	-	-	
16	Stainless steel heated Sampling Probes with thimble holders short and long	Yes	-	-	
17	Flue Gas analyzer	Yes	-	-	
18	Thermometer/ Thermocouple	Yes	-	-	
19	Calibrator for Noise Meters	Yes	-	-	
20	Digital Sound level (Noise) Metres	Yes	-	-	
21	Portable TOC Analyzer for emission monitoring.	No	6	-	
22	Polyurethane Foam PUF Sampler	No	6	-	
b) Optional Requirements					
1	Anemometer	Yes	-	-	available at CAAQM station (1 No.)
2	Weather Monitoring system	Yes	-	-	available at CAAQM station (1 No.)
3	Wind speed/wind direction monitor	Yes	-	-	available at CAAQM station (1 No.)
4	Continuous Ambient Air Monitoring System, Fixed	Yes	-	-	available at CAAQM station (1 No.)
5	Continuous PM10 Analyzer	Yes	-	-	available at CAAQM station (1 No.)
6	Continuous Ambient Air Monitoring System, Mobile	No	6	-	

7	Continuous PM2.5 analyzer	Yes	-	-	available at CAAQM station (1 No.)
8	Ambient Nitrogen Oxides (NO-NO2-NOx Analyzer)	Yes	-	-	including Ammonia Analyser , available at CAAQM station (1 No.)
9	Ambient Ozone Analyzer	Yes	-	-	available at CAAQM station (1 No.)
10	Ambient BTEX Analyzer	Yes	-	-	available at CAAQM station (1 No.)
11	Multipoint Gas Calibration system	Yes	-	-	available at CAAQM station (1 No.)
12	Ambient Sulphur Dioxide analyzer	Yes	-	-	available at CAAQM station (1 No.)
13	Ambient Carbon Monoxide & Carbon dioxide analyzer	Yes	-	-	available at CAAQM station (1 No.)
14	Total Hydrocarbon analyzer	No	6	-	
15	Ambient Ammonia analyzer	No	6	-	
16	Zero Gas Generator	Yes	-	-	available at CAAQM station (1 No.)
17	Synthetic Air Cylinder	No	6	-	
18	Calibration Gas Cylinders, SO2, NO, CO, NH3, Benzene and Toluene One each with stainless steel Regulators	Yes	-	-	available at CAAQM station (1 No.)
19	Continuous emission monitoring equipment	No	6	-	
20	19 inch Rack mounting system for air analyzers	Yes	-	-	available at CAAQM station (1 No.)
21	Dry Gas Meter	Yes	-	-	
22	Diesel Exhaust analyzer	No	6	-	
23	Exhaust CO/HC analyzer with Sampling Probe	No	6	-	
24	Automated Noise Monitoring System	No	6	-	
25	Integrating Sound level meter	No	6	-	
26	Continuous PM10& PM2.5 Monitoring Analyzer TEOM system	Yes	-	-	available at CAAQM station (1 No.), CAAQM station operates based on Beta ray attenuation
27	Top loading orifice kit for calibration of HVS	Yes	-	-	

28	Permeation tubes (SO ₂ , NO-NO ₂ -NO _x , NH ₃ , BTX)	No	6	-	
C. List of Equipment required for processing of Environmental Samples:					
a) Mandatory Requirements					
1	Accelerated Solvent Extraction (ASE) System	No	6	-	
2	Ammonia distillation assembly/TKN Analyzer	Yes	-	-	
3	Analytical Balance 4/5 digit & 6 digit (Digital)	Yes	-	-	
4	Aquarium for Toxicity bioassay test with complete accessories (*4 Nos)	No	6	-	
5	Autoclave (*2 Nos)	Yes	-	-	1 No. available
6	Bacteriological Incubators Stainless steel (*2 Nos)	Yes	-	-	
7	Bio safety cabinets	Yes	-	-	
8	BOD Incubators (2 nos.)	Yes	-	-	1 No. available
9	Centrifuge	No	6	-	
10	COD Digestion heated Blocks (2) with capacity 16 nos. or more	Yes	-	-	1 No. available
11	Cyanide Distillation Assembly (3)	Yes	-	-	1 No. available
12	Deep Freezer- Capacity 500 litre	Yes	-	-	180 lr available
13	Laboratory Ball Mill Grinder	No	6	-	
14	Laboratory Grinder	No	6	-	
15	Laminar Flow bench for Microbiological analysis	No	6	-	
16	Magnetic Stirrer with heating system (*2 Nos)	Yes	-	-	
17	Mechanical Shaker	No	6	-	
18	Membrane Filtration assembly with vacuum pump (2 nos.)	No	6	-	
19	Microbial culture refrigerator	No	6	-	

20	Microwave Digester with 16 vessels/ Hot Plate	Yes	-	-	Hot plate available
21	Muffle Furnace (*1 Nos), Range 1200 C	Yes	-	-	
22	Phenol distillation assembly (3)	Yes	-	-	1 No.available
23	Plate counter, Manual/Automatic	No	6	-	
24	Digestion Chambers/ Fume hood	Yes	-	-	
25	Digital Thermometer & Humidity meter- All lab area	Yes	-	-	
26	Dispensers (Various capacities) up to 5, 10, 25 & 50 ml	Yes	-	-	
27	Filtration Assembly with vacuum pump	No	6	-	
28	Fluoride Distillation Assembly (3)	Yes	-	-	1 No.available
29	Arsenic / Fluoride Glass Distillation assemblies	Yes	-	-	
30	Glass Double Distillation Assembly /Water Purification System	Yes	-	-	water purification sysem available
31	Heating mantles (2 nos.)	Yes	-	-	
32	Hot plates (small, Medium and Large) (*2 nos.)	Yes	-	-	1 No.available
33	Thermo Hygrometer	No	6	-	
34	Imhoff Cone	No	6	-	
35	Top loading Precision Digital Balance (minimum detection 0.001mg/0.01 mg) with anti-vibration facility- 3 nos. i.e 4/5 Digit (2 nos), - 6 Digit (1 no)	Yes	-	-	
36	Refrigerators Big Size 300 litres or more, double door- 2 nos.	Yes	-	-	1 No.available
37	Rotary Evaporator (Buchi type) with water recirculating chiller	No	6	-	
38	Separating funnel shaker	No	6	-	
39	Soxhlet Apparatus	Yes	-	-	

40	Solid Phase Extraction (SPE) /SPME Extraction system	No	6	-	
41	Thermometer (Alcohol)	No	6	-	
42	Dry & wet bulb Thermometer	No	6	-	
43	Toxicity characteristic leaching procedure (TCLP) Extractors (Zero head and Bottle)	No	6	-	
44	Ultra sonic water bath- Capacity 3 litre	No	6	-	
45	Water Bath with temperature control (*2 Nos)	Yes	-	-	available without temperature control
46	Water Bath with temp. for mercury sample digestion- 20 BOD Bottles	No	6	-	
D. Analytical Instruments at Environmental Laboratories					
a) Mandatory Requirements					
1	Atomic Absorption spectrometer (AAS)- Flame, Hydride & Graphite Tube Atomizer (GTA)	Yes	-	-	
2	Binocular Stereo Zoom Microscope	No	6	-	
3	Bomb Calorimeter	No	6	-	
4	BTX Analyzer with BTX calibrator	No	6	-	
5	Colony counter	No	6	-	
6	Conductivity meter- 2 nos.	Yes	-	-	1 No.available
7	Environment conditioning chamber	Yes	-	-	
8	Digital Burettes- 50 ml*2, 100 ml*2	No	6	-	
9	Dissolved Oxygen Meter (Bench model)	Yes	-	-	
10	Flame Photometer	Yes	-	-	
11	Flash Point Apparatus	No	6	-	
12	Gas Chromatograph Mass Spectrometer	No	6	-	
13	High Performance Liquid Chromatograph (HPLC)	No	6	-	

14	Inductively Coupled Plasma (ICP) Spectrometer-OES	No	6	-	
15	Ion Chromatograph Anion & Cations	No	6	-	
16	Methane and Non Methane (NMHC) Analyzer	No	6	-	
17	Microscope – 100x	No	6	-	
18	Microscope Binocular Research	No	6	-	
19	CO (NDIR based) Analyzer	Yes	-	-	
20	Nephelometer (Turbidity Meter)	Yes	-	-	
21	pH-Meter with combined electrode (3 point)- 2 nos.	Yes	-	-	1 No.available
22	Specific ion Analyzer with ion selective electrodes	No	6	-	
23	Spectrophotometer Visible (Portable)	No	6	-	
24	TKN Analyzer semi-automatic with aluminum block digester	Yes	-	-	
25	UV-Vis Spectrophotometer	Yes	-	-	
26	Moisture Content Analyzer	No	6	-	
b) Optional Requirements					
1	Automatic Titration Assembly	No	6	-	
2	Carbon, Hydrogen, Nitrogen and Sulphur (CHNS) Elemental Analyzer	No	6	-	
3	EDXRF Analyzer/WDXRF Analyzer	No	6	-	
4	Fourier-transform infrared Spectrometer (FTIR)	No	6	-	
5	Flocculator (Jar testing apparatus)	No	6	-	
6	Toxic Gas Analyzer	No	6	-	
7	Organic Halogen (AOX/TOX) Analyzer	No	6	-	
8	TOC Analyzer	No	6	-	

Note: It is requested to please ensure that each sheet is created separately for each laboratory and rename the sheet accordingly . For e.g. Central Laboratory, Regional Laboratory etc

LABORATORY ANALYTICAL FACILITIES

Name of the Board / Committee: Tamil Nadu Pollution Control Board - District Environmental Laboratory (DEL), Thoothukudi

PART I: Facility available for monitoring of environmental parameters:

S. No.	Parameters	Facilities Available (Yes / No)	If facility is not available, Specify Timeline for addition of this parameter. (in months)	Action Taken for addition of this parameter (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. Sample Matrix / Group of Water and Wastewater					
(a) Physical Tests					
1	Temperature	Yes	-	-	
2	Colour	Yes	-	-	
3	pH	Yes	-	-	
4	Turbidity	Yes	-	-	
5	Conductivity	Yes	-	-	
6	Total Solids	Yes	-	-	
7	Total Dissolved Solids (TDS)	Yes	-	-	
8	Total Suspended Solids (TSS)	Yes	-	-	
(b) Inorganic Tests					
(i) General & Non-metallic					
1	Alkalinity	Yes	-	-	
2	Chloride	Yes	-	-	
3	Cyanide	Yes	-	-	
4	Dissolved oxygen	Yes	-	-	

5	Nitrite nitrogen	Yes	-	-	
6	Nitrate nitrogen	Yes	-	-	
7	Ammonical nitrogen	Yes	-	-	
8	Fluoride	Yes	-	-	
9	Hardness (Total)	Yes	-	-	
10	Calcium	Yes	-	-	
11	Magnesium	Yes	-	-	
12	Phosphate	Yes	-	-	
13	Sulphate	Yes	-	-	
14	Sulphide	Yes	-	-	
15	Total Residual chlorine (TRC)	Yes	-	-	
(ii) Trace Metals Tests					
1	Aluminium (Al)	No	6	-	
2	Arsenic (As) Total	No	6	-	
3	Barium	No	6	-	
4	Boron	Yes	-	-	
5	Chromium (Cr) Hexavalent	Yes	-	-	
6	Chromium (Cr) Total	Yes	-	-	
7	Cadmium (Cd)	Yes	-	-	
8	Cobalt (Co)	Yes	-	-	
9	Copper (Cu)	Yes	-	-	
10	Iron (Fe)	Yes	-	-	
11	Lead (Pb)	Yes	-	-	
12	Manganese (Mn)	Yes	-	-	
13	Mercury (Hg)	Yes	-	-	
14	Nickel (Ni)	Yes	-	-	
15	Potassium (K)	Yes	-	-	

16	Sodium (Na)	Yes	-	-	
17	Vanadium (V)	No	6	-	
18	Zinc (Zn)	Yes	-	-	
19	Selenium (Se)	No	6	-	
(c) Organics (General) and Trace Organics Tests					
1	Biological Oxygen Demand (BOD)	Yes	-	-	
2	Chemical oxygen demand (COD)	Yes	-	-	
3	Oil & Grease	Yes	-	-	
4	Phenolic Compounds as C ₆ H ₅ OH	Yes	-	-	
5	Benzopyrene	No	6	-	
6	Pesticides				
6.a	Organochlorine Pesticides (OCPs) Tests				
i	Aldrin	No	6	-	
ii	Alpha Endosulphan	No	6	-	
iii	p,p'-DDT	No	6	-	
iv	Alpha-HCH	No	6	-	
v	Beta HCH	No	6	-	
vi	Beta Endosulphan	No	6	-	
vii	Gama-HCH	No	6	-	
viii	o,p'-DDT	No	6	-	
ix	p,p'-DDE	No	6	-	
6.b	Organophosphorus Pesticides (OPPs) Tests				
i	Malathion	No	6	-	
ii	Methyl parathion	No	6	-	
iii	Chlorpyrifos	No	6	-	
iv	Dimethoate	No	6	-	
v	Dieldrin	No	6	-	
vi	Ethion	No	6	-	
(d) Microbiological Tests					
1	Total Coliform	No	6	-	

2	Faecal Coliform	No	6	-	
3	E. Coli	No	6	-	
4	Faecal Streptococci	No	6	-	
(e) Toxicological Tests					
1	Bioassay method for evaluation of toxicity using fish (90% survival of fish after 96 hrs in 100% effluent)	No	6	-	
B. Sample Matrix / Group of Solid / Solid Waste					
(a) Soil / Sediment/Compost Tests					Facility available for Solid and sediment Tests
1	Cation Exchange Capacity (CEC)	Yes	-	-	
2	Electrical Conductivity (EC)	Yes	-	-	
3	Organic carbon (Chemical Method)	Yes	-	-	
4	pH	Yes	-	-	
5	Soil moisture	Yes	-	-	
6	Total nitrogen	Yes	-	-	
7	Metals by digestion (As, Cd, Cr, Pb, Ni etc.)	Yes	-	-	except As
(b) Hazardous Waste (Liquid / Slurry / Sludge / Solid / Semi-Solid) Tests					
1	Corrosivity	No	6	-	
2	Ignitability (Flash Point)	No	6	-	
3	Loss on Drying at 1050C (% Moisture Content)	No	6	-	
4	Loss on Drying at 5500C (% Organic Content)	No	6	-	
5	pH	No	6	-	
6	Organic carbon/matter (Chemical Method)	No	6	-	
7	Calorific Value	No	6	-	
8	Toxicity Characteristics leaching procedure (TCLP) Leachate and Metals in Leachate (As,Cd,Cr, Pb, Ni)	No	6	-	

C. Sample Matrix / Group of Analytes: Air					
(a) Ambient Air					
1	Nitrogen dioxide as NO2	Yes	-	-	
2	Sulphur dioxide (SO2)	Yes	-	-	
3	Particulate matter (PM10)	Yes	-	-	
4	Particulate matter (PM2.5)	Yes	-	-	
5	Carbon Monoxide	No	6	-	
6	Ozone	Yes	-	-	
7	Benzene	No	6	-	
8	Ammonia	Yes	-	-	
9	Metals in Particulate Matter, Pb	Yes	-	-	
10	Metals in Particulate Matter, As	Yes	-	-	
11	Metals in Particulate Matter, Ni	Yes	-	-	
12	Particulate Benzo-a-Pyrene (BaP)	No	6	-	
(b) Stack Gas / Stationary Source Emission					
1	Particulate Matter	Yes	-	-	
2	Sulphur Dioxide	Yes	-	-	
3	Carbon Dioxide	Yes	-	-	
4	Carbon Monoxide (NDIR based Method)	No	6	-	
5	Temperature	Yes	-	-	
6	Moisture	Yes	-	-	
7	Oxygen	Yes	-	-	
8	Oxides of Nitrogen	Yes	-	-	
9	Halides (HCL/HF)	Yes	-	-	
(c) Noise Level					
1	Ambient Noise level measurement (20 to 140 dB)	Yes	-	-	
2	Source Noise Level Measurement (Industrial process, DG set- 20 to 140dB)	Yes	-	-	

(d) Meteorological Monitoring					
1	Ambient Temperature	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
2	Wind direction	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
3	Wind speed	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
4	Relative Humidity	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
5	Mixing Height	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station

Specific remarks, if any

PART II: Details of Laboratory Infrastructure (Instruments and Equipment)

S. No.	Name of Instrument / Equipments	Available Yes / No	If the Instrument / Equipment is not available, Specify Timeline for procurement of this instrument (in months)	Action Taken for procurement of this Instrument / Equipment (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. List of Instruments / Equipment for Sampling of Water, Wastewater and Soil / Hazardous Wastes					
a) Mandatory Requirements					
1	Portable / Pen type pH meter / pH strip	Yes	-	-	
2	Portable Dissolved Oxygen Meter / Field Fixing using chemicals	Yes	-	-	
3	Electrical Conductivity meter pen type	No	6	procurement initiated	
4	Flow meter / Physical flow measuring	No	6	-	
5	GPS / Mobile with GPS app	No	6	-	

6	Ice Box (2 nos.) (150 litre & 100 litre capacities)	Yes	-	-	
7	Thermometer	Yes	-	-	
8	Stainless steel bucket with nylon rope and mug	Yes	-	-	
9	Ground water level measuring device	No	6	-	
10	Scoop / shovel	Yes	-	-	
11	Auger / core sampler	No	6	-	
b) Optional Requirements					
1	Bottom Sampler / Depth sampler	No	6	-	
2	Chloroscope for residual chlorine	No	6	-	
3	Vandorn or equivalent water sampler (Automatic sampler when composite sampling to be done)	No	6	-	
4	Ekman Dredge	No	6	-	
B. List of Instruments / Equipment for Sampling of Ambient Air and Source Emission monitoring					
a) Mandatory Requirements					
1	Fine dust samplers PM2.5 (*4 Nos)	Yes	-	-	
2	Respirable Dust Sampler PM 10 (* 4 Nos)	Yes	-	-	
3	High Volume Sampler (SPM) (4 Nos)	Yes	-	-	
4	Handy Sampler with set of glass impingers (*2 Nos)	No	6	-	
5	Low Volume Sampler (LVS)	No	6	-	
6	Tedler bags different sizes	No	6	-	
7	Meteorological tower (All in one telescopic Mast) with sensors comprising wind speed, wind direction, ambient temp., Relative humidity, Solar radiation, rainfall etc.	Yes	-	-	available at CAAQM stations (1 No.)
8	Nitrogen Cylinder portable	No	6	-	
9	Activated Charcoal tubes/ Tenex	No	6	-	

10	Barometer (Digital)	No	6	-	
11	Isokinetic Stack Monitoring Kit complete with Stack monitoring instrument panel with inclined cum vertical manometer, Cold Box, Vacuum pump, Glass assembly impingers	Yes	-	-	
12	Modified S type Stainless steel Pitot tube (Standard length) with Assembly	Yes	-	-	
13	Monoblock type, rotary design vacuum pump	Yes	-	-	
14	Orsat Apparatus	Yes	-	-	
15	Source emission monitoring Impingers train set with spare impingers 100 ml & 225 ml capacity	Yes	-	-	
16	Stainless steel heated Sampling Probes with thimble holders short and long	Yes	-	-	
17	Flue Gas analyzer	Yes	-	-	
18	Thermometer/ Thermocouple	Yes	-	-	
19	Calibrator for Noise Meters	Yes	-	-	
20	Digital Sound level (Noise) Metres	Yes	-	-	
21	Portable TOC Analyzer for emission monitoring.	No	6	-	
22	Polyurethane Foam PUF Sampler	No	6	-	
b) Optional Requirements					
1	Anemometer	Yes	-	-	available at CAAQM station (1 No.)
2	Weather Monitoring system	Yes	-	-	available at CAAQM station (1 No.)
3	Wind speed/wind direction monitor	Yes	-	-	available at CAAQM station (1 No.)
4	Continuous Ambient Air Monitoring System, Fixed	Yes	-	-	available at CAAQM station (1 No.)
5	Continuous PM10 Analyzer	Yes	-	-	available at CAAQM station (1 No.)
6	Continuous Ambient Air Monitoring System, Mobile	No	6	-	

7	Continuous PM2.5 analyzer	Yes	-	-	available at CAAQM station (1 No.)
8	Ambient Nitrogen Oxides (NO-NO2-NOx Analyzer)	Yes	-	-	available at CAAQM station (1 No.)
9	Ambient Ozone Analyzer	Yes	-	-	available at CAAQM station (1 No.)
10	Ambient BTEX Analyzer	Yes	-	-	available at CAAQM station (1 No.)
11	Multipoint Gas Calibration system	Yes	-	-	available at CAAQM station (1 No.)
12	Ambient Sulphur Dioxide analyzer	Yes	-	-	available at CAAQM station (1 No.)
13	Ambient Carbon Monoxide & Carbon dioxide analyzer	Yes	-	-	available at CAAQM station (1 No.)
14	Total Hydrocarbon analyzer	No	6	-	
15	Ambient Ammonia analyzer	No	6	-	
16	Zero Gas Generator	Yes	-	-	available at CAAQM station (1 No.)
17	Synthetic Air Cylinder	No	6	-	
18	Calibration Gas Cylinders, SO2, NO, CO, NH3, Benzene and Toluene One each with stainless steel Regulators	Yes	-	-	available at CAAQM station (1 No.)
19	Continuous emission monitoring equipment	No	6	-	
20	19 inch Rack mounting system for air analyzers	Yes	-	-	available at CAAQM station (1 No.)
21	Dry Gas Meter	Yes	-	-	
22	Diesel Exhaust analyzer	No	6	-	
23	Exhaust CO/HC analyzer with Sampling Probe	No	6	-	
24	Automated Noise Monitoring System	No	6	-	
25	Integrating Sound level meter	No	6	-	
26	Continuous PM10& PM2.5 Monitoring Analyzer TEOM system	Yes	-	-	available at CAAQM station (1 No.), CAAQM station operates based on Beta ray attenuation
27	Top loading orifice kit for calibration of HVS	Yes	-	-	

28	Permeation tubes (SO ₂ , NO-NO ₂ -NO _x , NH ₃ , BTX)	No	6	-	
C. List of Equipment required for processing of Environmental Samples:					
a) Mandatory Requirements					
1	Accelerated Solvent Extraction (ASE) System	No	6	-	
2	Ammonia distillation assembly/TKN Analyzer	Yes	-	-	
3	Analytical Balance 4/5 digit & 6 digit (Digital)	Yes	-	-	
4	Aquarium for Toxicity bioassay test with complete accessories (*4 Nos)	No	6	-	
5	Autoclave (*2 Nos)	Yes	-	-	1 No. available
6	Bacteriological Incubators Stainless steel (*2 Nos)	Yes	-	-	
7	Bio safety cabinets	Yes	-	-	
8	BOD Incubators (2 nos.)	Yes	-	-	1 No. available
9	Centrifuge	No	6	-	
10	COD Digestion heated Blocks (2) with capacity 16 nos. or more	Yes	-	-	1 No. available
11	Cyanide Distillation Assembly (3)	Yes	-	-	1 No. available
12	Deep Freezer- Capacity 500 litre	Yes	-	-	180 lr
13	Laboratory Ball Mill Grinder	No	6	-	
14	Laboratory Grinder	No	6	-	
15	Laminar Flow bench for Microbiological analysis	No	6	-	
16	Magnetic Stirrer with heating system (*2 Nos)	Yes	-	-	
17	Mechanical Shaker	No	6	-	
18	Membrane Filtration assembly with vacuum pump (2 nos.)	No	6	-	
19	Microbial culture refrigerator	No	6	-	

20	Microwave Digester with 16 vessels/ Hot Plate	Yes	-	-	Hot plate available
21	Muffle Furnace (*1 Nos), Range 1200 C	Yes	-	-	
22	Phenol distillation assembly (3)	Yes	-	-	1 No. available
23	Plate counter, Manual/Automatic	No	6	-	
24	Digestion Chambers/ Fume hood	Yes	-	-	
25	Digital Thermometer & Humidity meter- All lab area	Yes	-	-	
26	Dispensers (Various capacities) up to 5, 10, 25 & 50 ml	Yes	-	-	
27	Filtration Assembly with vacuum pump	No	6	-	
28	Fluoride Distillation Assembly (3)	Yes	-	-	1 No. available
29	Arsenic / Fluoride Glass Distillation assemblies	Yes	-	-	
30	Glass Double Distillation Assembly /Water Purification System	Yes	-	-	water purification system
31	Heating mantles (2 nos.)	Yes	-	-	
32	Hot plates (small, Medium and Large) (*2 nos.)	Yes	-	-	1 No. available
33	Thermo Hygrometer	No	6	-	
34	Imhoff Cone	No	6	-	
35	Top loading Precision Digital Balance (minimum detection 0.001mg/0.01 mg) with anti-vibration facility- 3 nos. i.e 4/5 Digit (2 nos), - 6 Digit (1 no)	Yes	-	-	
36	Refrigerators Big Size 300 litres or more, double door- 2 nos.	Yes	-	-	1 No. available
37	Rotary Evaporator (Buchi type) with water recirculating chiller	No	6	-	
38	Separating funnel shaker	No	6	-	
39	Soxhlet Apparatus	Yes	-	-	

40	Solid Phase Extraction (SPE) /SPME Extraction system	No	6	-	
41	Thermometer (Alcohol)	No	6	-	
42	Dry & wet bulb Thermometer	No	6	-	
43	Toxicity characteristic leaching procedure (TCLP) Extractors (Zero head and Bottle)	No	6	-	
44	Ultra sonic water bath- Capacity 3 litre	No	6	-	
45	Water Bath with temperature control (*2 Nos)	Yes	-	-	available without temperature control
46	Water Bath with temp. for mercury sample digestion- 20 BOD Bottles	No	6	-	
D. Analytical Instruments at Environmental Laboratories					
a) Mandatory Requirements					
1	Atomic Absorption spectrometer (AAS)- Flame, Hydride & Graphite Tube Atomizer (GTA)	Yes	-	-	
2	Binocular Stereo Zoom Microscope	No	6	-	
3	Bomb Calorimeter	No	6	-	
4	BTX Analyzer with BTX calibrator	No	6	-	
5	Colony counter	No	6	-	
6	Conductivity meter- 2 nos.	Yes	-	-	1 No. available
7	Environment conditioning chamber	Yes	-	-	
8	Digital Burettes- 50 ml*2, 100 ml*2	No	6	-	
9	Dissolved Oxygen Meter (Bench model)	Yes	-	-	
10	Flame Photometer	Yes	-	-	
11	Flash Point Apparatus	No	6	-	
12	Gas Chromatograph Mass Spectrometer	No	6	-	
13	High Performance Liquid Chromatograph (HPLC)	No	6	-	

14	Inductively Coupled Plasma (ICP) Spectrometer-OES	No	6	-	
15	Ion Chromatograph Anion & Cations	No	6	-	
16	Methane and Non Methane (NMHC) Analyzer	No	6	-	
17	Microscope – 100x	No	6	-	
18	Microscope Binocular Research	No	6	-	
19	CO (NDIR based) Analyzer	Yes	-	-	
20	Nephelometer (Turbidity Meter)	Yes	-	-	
21	pH-Meter with combined electrode (3 point)- 2 nos.	Yes	-	-	1 No. available
22	Specific ion Analyzer with ion selective electrodes	No	6	-	
23	Spectrophotometer Visible (Portable)	No	6	-	
24	TKN Analyzer semi-automatic with aluminum block digester	Yes	-	-	
25	UV-Vis Spectrophotometer	Yes	-	-	
26	Moisture Content Analyzer	No	6	-	
b) Optional Requirements					
1	Automatic Titration Assembly	No	6	-	
2	Carbon, Hydrogen, Nitrogen and Sulphur (CHNS) Elemental Analyzer	No	6	-	
3	EDXRF Analyzer/WDXRF Analyzer	No	6	-	
4	Fourier-transform infrared Spectrometer (FTIR)	No	6	-	
5	Flocculator (Jar testing apparatus)	No	6	-	
6	Toxic Gas Analyzer	No	6	-	
7	Organic Halogen (AOX/TOX) Analyzer	No	6	-	
8	TOC Analyzer	No	6	-	
9	High Resolution Mass Spectrometer (HRGC-HRMS)	No	6	-	

10	Inductively Coupled Plasma Mass (ICP-MS) Spectrometer	No	6	-	
11	X Ray Fluorescence (XRF) Spectrometer (Portable)	No	6	-	
Specific remarks, if any:					

Note: It is requested to please ensure that each sheet is created separately for each laboratory and rename the sheet accordingly . For e.g. Central Laboratory, Regional Laboratory etc

LABORATORY ANALYTICAL FACILITIES

Name of the Board / Committee: Tamil Nadu Pollution Control Board - District Environmental Laboratory (DEL), Tiruppur

PART I: Facility available for monitoring of environmental parameters:

S. No.	Parameters	Facilities Available (Yes / No)	If facility is not available, Specify Timeline for addition of this parameter. (in months)	Action Taken for addition of this parameter (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. Sample Matrix / Group of Water and Wastewater					
(a) Physical Tests					
1	Temperature	Yes	-	-	
2	Colour	Yes	-	-	
3	pH	Yes	-	-	
4	Turbidity	Yes	-	-	
5	Conductivity	Yes	-	-	
6	Total Solids	Yes	-	-	
7	Total Dissolved Solids (TDS)	Yes	-	-	
8	Total Suspended Solids (TSS)	Yes	-	-	
(b) Inorganic Tests					
(i) General & Non-metallic					
1	Alkalinity	Yes	-	-	
2	Chloride	Yes	-	-	
3	Cyanide	Yes	-	-	
4	Dissolved oxygen	Yes	-	-	

5	Nitrite nitrogen	Yes	-	-	
6	Nitrate nitrogen	Yes	-	-	
7	Ammonical nitrogen	Yes	-	-	
8	Fluoride	Yes	-	-	
9	Hardness (Total)	Yes	-	-	
10	Calcium	Yes	-	-	
11	Magnesium	Yes	-	-	
12	Phosphate	Yes	-	-	
13	Sulphate	Yes	-	-	
14	Sulphide	Yes	-	-	
15	Total Residual chlorine (TRC)	Yes	-	-	
(ii) Trace Metals Tests					
1	Aluminium (Al)	No	6	-	
2	Arsenic (As) Total	No	6	-	
3	Barium	No	6	-	
4	Boron	Yes	-	-	
5	Chromium (Cr) Hexavalent	Yes	-	-	
6	Chromium (Cr) Total	Yes	-	-	
7	Cadmium (Cd)	Yes	-	-	
8	Cobalt (Co)	Yes	-	-	
9	Copper (Cu)	Yes	-	-	
10	Iron (Fe)	Yes	-	-	
11	Lead (Pb)	Yes	-	-	
12	Manganese (Mn)	Yes	-	-	
13	Mercury (Hg)	Yes	-	-	
14	Nickel (Ni)	Yes	-	-	
15	Potassium (K)	Yes	-	-	

16	Sodium (Na)	Yes	-	-	
17	Vanadium (V)	No	6	-	
18	Zinc (Zn)	Yes	-	-	
19	Selenium (Se)	No	6	-	
(c) Organics (General) and Trace Organics Tests					
1	Biological Oxygen Demand (BOD)	Yes	-	-	
2	Chemical oxygen demand (COD)	Yes	-	-	
3	Oil & Grease	Yes	-	-	
4	Phenolic Compounds as C ₆ H ₅ OH	Yes	-	-	
5	Benzopyrene	No	6	-	
6	Pesticides				
6.a	Organochlorine Pesticides (OCPs) Tests				
i	Aldrin	No	6	-	
ii	Alpha Endosulphan	No	6	-	
iii	p,p'-DDT	No	6	-	
iv	Alpha-HCH	No	6	-	
v	Beta HCH	No	6	-	
vi	Beta Endosulphan	No	6	-	
vii	Gama-HCH	No	6	-	
viii	o,p'-DDT	No	6	-	
ix	p,p'-DDE	No	6	-	
6.b	Organophosphorus Pesticides (OPPs) Tests				
i	Malathion	No	6	-	
ii	Methyl parathion	No	6	-	
iii	Chlorpyrifos	No	6	-	
iv	Dimethoate	No	6	-	
v	Dieldrin	No	6	-	
vi	Ethion	No	6	-	
(d) Microbiological Tests					
1	Total Coliform	No	6	-	

2	Faecal Coliform	No	6	-	
3	E. Coli	No	6	-	
4	Faecal Streptococci	No	6	-	
(e) Toxicological Tests					
1	Bioassay method for evaluation of toxicity using fish (90% survival of fish after 96 hrs in 100% effluent)	No	6	-	
B. Sample Matrix / Group of Solid / Solid Waste					
(a) Soil / Sediment/Compost Tests					Facility available for Solid and sediment Tests
1	Cation Exchange Capacity (CEC)	Yes	-	-	
2	Electrical Conductivity (EC)	Yes	-	-	
3	Organic carbon (Chemical Method)	Yes	-	-	
4	pH	Yes	-	-	
5	Soil moisture	Yes	-	-	
6	Total nitrogen	Yes	-	-	
7	Metals by digestion (As, Cd, Cr, Pb, Ni etc.)	Yes	-	-	except As
(b) Hazardous Waste (Liquid / Slurry / Sludge / Solid / Semi-Solid) Tests					
1	Corrosivity	No	6	-	
2	Ignitability (Flash Point)	No	6	-	
3	Loss on Drying at 1050C (% Moisture Content)	No	6	-	
4	Loss on Drying at 5500C (% Organic Content)	No	6	-	
5	pH	No	6	-	
6	Organic carbon/matter (Chemical Method)	No	6	-	
7	Calorific Value	No	6	-	
8	Toxicity Characteristics leaching procedure (TCLP) Leachate and Metals in Leachate (As,Cd,Cr, Pb, Ni)	No	6	-	
C. Sample Matrix / Group of Analytes: Air					

(a) Ambient Air					
1	Nitrogen dioxide as NO ₂	Yes	-	-	
2	Sulphur dioxide (SO ₂)	Yes	-	-	
3	Particulate matter (PM ₁₀)	Yes	-	-	
4	Particulate matter (PM _{2.5})	Yes	-	-	
5	Carbon Monoxide	No	6	-	
6	Ozone	Yes	-	-	
7	Benzene	No	6	-	
8	Ammonia	Yes	-	-	
9	Metals in Particulate Matter, Pb	Yes	-	-	
10	Metals in Particulate Matter, As	Yes	-	-	
11	Metals in Particulate Matter, Ni	Yes	-	-	
12	Particulate Benzo-a-Pyrene (BaP)	No	6	-	
(b) Stack Gas / Stationary Source Emission					
1	Particulate Matter	Yes	-	-	
2	Sulphur Dioxide	Yes	-	-	
3	Carbon Dioxide	Yes	-	-	
4	Carbon Monoxide (NDIR based Method)	No	6	-	
5	Temperature	Yes	-	-	
6	Moisture	Yes	-	-	
7	Oxygen	Yes	-	-	
8	Oxides of Nitrogen	Yes	-	-	
9	Halides (HCL/HF)	Yes	-	-	
(c) Noise Level					
1	Ambient Noise level measurement (20 to 140 dB)	Yes	-	-	
2	Source Noise Level Measurement (Industrial process, DG set- 20 to 140dB)	Yes	-	-	
(d) Meteorological Monitoring					

1	Ambient Temperature	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
2	Wind direction	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
3	Wind speed	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
4	Relative Humidity	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station
5	Mixing Height	Yes	-	-	At present datas received from Meteorological Tower of CAAQM station

Specific remarks, if any:

PART II: Details of Laboratory Infrastructure (Instruments and Equipment)

S. No.	Name of Instrument / Equipments	Available Yes / No	If the Instrument / Equipment is not available, Specify Timeline for procurement of this instrument (in months)	Action Taken for procurement of this Instrument / Equipment (Specification finalized / procurement initiated / work awarded / outsourced)	Remarks
A. List of Instruments / Equipment for Sampling of Water, Wastewater and Soil / Hazardous Wastes					
a) Mandatory Requirements					
1	Portable / Pen type pH meter / pH strip	Yes	-	-	
2	Portable Dissolved Oxygen Meter / Field Fixing using chemicals	Yes	-	-	
3	Electrical Conductivity meter pen type	No	6	procurement initiated	
4	Flow meter / Physical flow measuring	No	6	-	
5	GPS / Mobile with GPS app	No	6	-	

6	Ice Box (2 nos.) (150 litre & 100 litre capacities)	Yes	-	-	
7	Thermometer	Yes	-	-	
8	Stainless steel bucket with nylon rope and mug	Yes	-	-	
9	Ground water level measuring device	No	6	-	
10	Scoop / shovel	Yes	-	-	
11	Auger / core sampler	No	6	-	
b) Optional Requirements					
1	Bottom Sampler / Depth sampler	No	6	-	
2	Chloroscope for residual chlorine	No	6	-	
3	Vandorn or equivalent water sampler (Automatic sampler when composite sampling to be done)	No	6	-	
4	Ekman Dredge	No	6	-	
B. List of Instruments / Equipment for Sampling of Ambient Air and Source Emission monitoring					
a) Mandatory Requirements					
1	Fine dust samplers PM2.5 (*4 Nos)	Yes	-	-	
2	Respirable Dust Sampler PM 10 (* 4 Nos)	Yes	-	-	
3	High Volume Sampler (SPM) (4 Nos)	Yes	-	-	
4	Handy Sampler with set of glass impingers (*2 Nos)	No	6	-	
5	Low Volume Sampler (LVS)	No	6	-	
6	Tedler bags different sizes	No	6	-	
7	Meteorological tower (All in one telescopic Mast) with sensors comprising wind speed, wind direction, ambient temp., Relative humidity, Solar radiation, rainfall etc.	Yes	-	-	available at CAAQM station (1 No.)
8	Nitrogen Cylinder portable	No	6	-	
9	Activated Charcoal tubes/ Tenex	No	6	-	

10	Barometer (Digital)	No	6	-	
11	Isokinetic Stack Monitoring Kit complete with Stack monitoring instrument panel with inclined cum vertical manometer, Cold Box, Vacuum pump, Glass assembly impingers	Yes	-	-	
12	Modified S type Stainless steel Pitot tube (Standard length) with Assembly	Yes	-	-	
13	Monoblock type, rotary design vacuum pump	Yes	-	-	
14	Orsat Apparatus	Yes	-	-	
15	Source emission monitoring Impingers train set with spare impingers 100 ml & 225 ml capacity	Yes	-	-	
16	Stainless steel heated Sampling Probes with thimble holders short and long	Yes	-	-	
17	Flue Gas analyzer	Yes	-	-	
18	Thermometer/ Thermocouple	Yes	-	-	
19	Calibrator for Noise Meters	Yes	-	-	
20	Digital Sound level (Noise) Metres	Yes	-	-	
21	Portable TOC Analyzer for emission monitoring.	No	6	-	
22	Polyurethane Foam PUF Sampler	No	6	-	
b) Optional Requirements					
1	Anemometer	Yes	-	-	available at CAAQM station (1 No.)
2	Weather Monitoring system	Yes	-	-	available at CAAQM station (1 No.)
3	Wind speed/wind direction monitor	Yes	-	-	available at CAAQM station (1 No.)
4	Continuous Ambient Air Monitoring System, Fixed	Yes	-	-	available at CAAQM station (1 No.)
5	Continuous PM10 Analyzer	Yes	-	-	available at CAAQM station (1 No.)
6	Continuous Ambient Air Monitoring System, Mobile	No	6	-	

7	Continuous PM2.5 analyzer	Yes	-	-	available at CAAQM station (1 No.)
8	Ambient Nitrogen Oxides (NO-NO2-NOx Analyzer	Yes	-	-	available at CAAQM station (1 No.)
9	Ambient Ozone Analyzer	Yes	-	-	available at CAAQM station (1 No.)
10	Ambient BTEX Analyzer	Yes	-	-	available at CAAQM station (1 No.)
11	Multipoint Gas Calibration system	Yes	-	-	available at CAAQM station (1 No.)
12	Ambient Sulphur Dioxide analyzer	Yes	-	-	available at CAAQM station (1 No.)
13	Ambient Carbon Monoxide & Carbon dioxide analyzer	Yes	-	-	available at CAAQM station (1 No.)
14	Total Hydrocarbon analyzer	No	6	-	
15	Ambient Ammonia analyzer	No	6	-	
16	Zero Gas Generator	Yes	-	-	
17	Synthetic Air Cylinder	No	6	-	
18	Calibration Gas Cylinders, SO2, NO, CO, NH3, Benzene and Toluene One each with stainless steel Regulators	Yes	-	-	available at CAAQM station (1 No.)
19	Continuous emission monitoring equipment	No	6	-	
20	19 inch Rack mounting system for air analyzers	Yes	-	-	available at CAAQM station (1 No.)
21	Dry Gas Meter	Yes	-	-	
22	Diesel Exhaust analyzer	No	6	-	
23	Exhaust CO/HC analyzer with Sampling Probe	No	6	-	
24	Automated Noise Monitoring System	No	6	-	
25	Integrating Sound level meter	No	6	-	
26	Continuous PM10& PM2.5 Monitoring Analyzer TEOM system	Yes	-	-	available at CAAQM station (1 No.), CAAQM station operates based on Beta ray attenuation
27	Top loading orifice kit for calibration of HVS	Yes	-	-	

28	Permeation tubes (SO ₂ , NO-NO ₂ -NO _x ,NH ₃ , BTX)	No	6	-	
C. List of Equipment required for processing of Environmental Samples:					
a) Mandatory Requirements					
1	Accelerated Solvent Extraction (ASE) System	No	6	-	
2	Ammonia distillation assembly/TKN Analyzer	Yes	-	-	
3	Analytical Balance 4/5 digit & 6 digit (Digital)	Yes	-	-	
4	Aquarium for Toxicity bioassay test with complete accessories (*4 Nos)	No	6	-	
5	Autoclave (*2 Nos)	Yes	-	-	1 No. available
6	Bacteriological Incubators Stainless steel (*2 Nos)	Yes	-	-	
7	Bio safety cabinets	Yes	-	-	
8	BOD Incubators (2 nos.)	Yes	-	-	available at CAAQM station (1 No.)
9	Centrifuge	No	6	-	
10	COD Digestion heated Blocks (2) with capacity 16 nos. or more	Yes	-	-	available at CAAQM station (1 No.)
11	Cyanide Distillation Assembly (3)	Yes	-	-	available at CAAQM station (1 No.)
12	Deep Freezer- Capacity 500 litre	Yes	-	-	180 lr available
13	Laboratory Ball Mill Grinder	No	6	-	
14	Laboratory Grinder	No	6	-	
15	Laminar Flow bench for Microbiological analysis	No	6	-	
16	Magnetic Stirrer with heating system (*2 Nos)	Yes	-	-	
17	Mechanical Shaker	No	6	-	
18	Membrane Filtration assembly with vacuum pump (2 nos.)	No	6	-	
19	Microbial culture refrigerator	No	6	-	

20	Microwave Digester with 16 vessels/ Hot Plate	Yes	-	-	Hot plate available
21	Muffle Furnace (*1 Nos), Range 1200 C	Yes	-	-	
22	Phenol distillation assembly (3)	Yes	-	-	available at CAAQM station (1 No.)
23	Plate counter, Manual/Automatic	No	6	-	
24	Digestion Chambers/ Fume hood	Yes	-	-	
25	Digital Thermometer & Humidity meter- All lab area	Yes	-	-	
26	Dispensers (Various capacities) up to 5, 10, 25 & 50 ml	Yes	-	-	
27	Filtration Assembly with vacuum pump	No	6	-	available at CAAQM station (1 No.)
28	Fluoride Distillation Assembly (3)	Yes	-	-	
29	Arsenic / Fluoride Glass Distillation assemblies	Yes	-	-	
30	Glass Double Distillation Assembly /Water Purification System	Yes	-	-	water purification system available
31	Heating mantles (2 nos.)	Yes	-	-	
32	Hot plates (small, Medium and Large) (*2 nos.)	Yes	-	-	available at CAAQM station (1 No.)
33	Thermo Hygrometer	No	6	-	
34	Imhoff Cone	No	6	-	
35	Top loading Precision Digital Balance (minimum detection 0.001mg/0.01 mg) with anti-vibration facility- 3 nos. i.e 4/5 Digit (2 nos), - 6 Digit (1 no)	Yes	-	-	
36	Refrigerators Big Size 300 litres or more, double door- 2 nos.	Yes	-	-	available at CAAQM station (1 No.)
37	Rotary Evaporator (Buchi type) with water recirculating chiller	No	6	-	
38	Separating funnel shaker	No	6	-	
39	Soxhlet Apparatus	Yes	-	-	

40	Solid Phase Extraction (SPE) /SPME Extraction system	No	6	-	
41	Thermometer (Alcohol)	No	6	-	
42	Dry & wet bulb Thermometer	No	6	-	
43	Toxicity characteristic leaching procedure (TCLP) Extractors (Zero head and Bottle)	No	6	-	
44	Ultra sonic water bath- Capacity 3 litre	No	6	-	
45	Water Bath with temperature control (*2 Nos)	Yes	-	-	available without temperature control
46	Water Bath with temp. for mercury sample digestion- 20 BOD Bottles	No	6	-	
D. Analytical Instruments at Environmental Laboratories					
a) Mandatory Requirements					
1	Atomic Absorption spectrometer (AAS)- Flame, Hydride & Graphite Tube Atomizer (GTA)	Yes	-	-	
2	Binocular Stereo Zoom Microscope	No	6	-	
3	Bomb Calorimeter	No	6	-	
4	BTX Analyzer with BTX calibrator	No	6	-	
5	Colony counter	No	6	-	
6	Conductivity meter- 2 nos.	Yes	-	-	available at CAAQM station (1 No.)
7	Environment conditioning chamber	Yes	-	-	
8	Digital Burettes- 50 ml*2, 100 ml*2	No	6	-	
9	Dissolved Oxygen Meter (Bench model)	Yes	-	-	
10	Flame Photometer	Yes	-	-	
11	Flash Point Apparatus	No	6	-	
12	Gas Chromatograph Mass Spectrometer	No	6	-	
13	High Performance Liquid Chromatograph (HPLC)	No	6	-	

14	Inductively Coupled Plasma (ICP) Spectrometer-OES	No	6	-	
15	Ion Chromatograph Anion & Cations	No	6	-	
16	Methane and Non Methane (NMHC) Analyzer	No	6	-	
17	Microscope – 100x	No	6	-	
18	Microscope Binocular Research	No	6	-	
19	CO (NDIR based) Analyzer	Yes	-	-	
20	Nephelometer (Turbidity Meter)	Yes	-	-	
21	pH-Meter with combined electrode (3 point)- 2 nos.	Yes	-	-	available at CAAQM station (1 No.)
22	Specific ion Analyzer with ion selective electrodes	No	6	-	
23	Spectrophotometer Visible (Portable)	No	6	-	
24	TKN Analyzer semi-automatic with aluminum block digester	Yes	-	-	
25	UV-Vis Spectrophotometer	Yes	-	-	
26	Moisture Content Analyzer	No	6	-	
b) Optional Requirements					
1	Automatic Titration Assembly	No	6	-	
2	Carbon, Hydrogen, Nitrogen and Sulphur (CHNS) Elemental Analyzer	No	6	-	
3	EDXRF Analyzer/WDXRF Analyzer	No	6	-	
4	Fourier-transform infrared Spectrometer (FTIR)	No	6	-	
5	Flocculator (Jar testing apparatus)	No	6	-	
6	Toxic Gas Analyzer	No	6	-	
7	Organic Halogen (AOX/TOX) Analyzer	No	6	-	
8	TOC Analyzer	No	6	-	
9	High Resolution Mass Spectrometer (HRGC-HRMS)	No	6	-	

10	Inductively Coupled Plasma Mass (ICP-MS) Spectrometer	No	6	-	
11	X Ray Fluorescence (XRF) Spectrometer (Portable)	No	6	-	
Specific remarks, if any:					

PART III: DETAILS OF LABORATORIES ESTABLISHED UNDER THE WATER (P & CP) ACT, 1974

Laboratory established by the Board, as per Section 17 (2) of Water Act – Nos.				Laboratories / Institutes specified by State Govt., as State Water Laboratory as per Section 52 (1) of Water Act (other than those set up by Board) - Nos								NABL Accreditation			EPA Recognition		
No. of Laboratories established / recognised	No. of Laboratories (out of those given in column No. (1)) notified in Official Gazette	No. of remaining Laboratories Planned for Notification (out of those laboratories given in column No. (3))	Time line required for notification of Laboratories given in column No. (3) (in months)	No. of Laboratories established / specified		No. of Laboratories (out of those given in column No. (5 & 6)) notified in Official Gazette		No. of remaining Laboratories Planned for Notification (out of those laboratories given in column No. (5 & 6)).		Time line required for notification of Laboratories given in column No. (9 & 10) (in months)		No. of Board's Laboratories 17 (2)	No. of State Water Laboratories 52(1)		No. of Board's Laboratories 17 (2)	No. of State Water Laboratories 52(1)	
				Govt.	Pvt.	Govt.	Pvt.	Govt.	Pvt.	Govt.	Pvt.		Govt.	Pvt.		Govt.	Pvt.
-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12	-13	-14	-15	-16	-17	-18
18	Nil	will be notified	6 months	18	Nil	Nil	Nil	will be notified	Nil	6 months	Nil	4	Nil	Nil	1	Nil	Nil

Note: The list of the laboratory may be attached separately (Board, State Govt. and Private)

Specific remarks, if any:

PART IV: DETAILS OF LABORATORIES ESTABLISHED UNDER THE AIR (P & CP) ACT, 1981

Laboratory established by the Board, as per Section 17 (2) of Air Act – Nos.				Laboratories / Institutes specified by State Govt., as State Air Laboratory as per Section 28 (1) of Air Act (other than those set up by Board) - Nos								NABL Accreditation			EPA Recognition		
No. of Laboratories established / recognised	No. of Laboratories (out of those given in column No. (1)) notified in Official Gazette	No. of remaining Laboratories Planned for Notification (out of those laboratories given in column No. (3))	Time line required for notification of Laboratories given in column No. (3) (in months)	No. of Laboratories established / specified		No. of Laboratories (out of those given in column No. (5 & 6)) notified in Official Gazette		No. of remaining Laboratories Planned for Notification (out of those laboratories given in column No. (5 & 6)).		Time line required for notification of Laboratories given in column No. (9 & 10) (in months)		No. of Board's Laboratories 17 (2)	No. of State Water Laboratories 28(1)		No. of Board's Laboratories 17 (2)	No. of State Water Laboratories 28(1)	
				Govt.	Pvt.	Govt.	Pvt.	Govt.	Pvt.	Govt.	Pvt.		Govt.	Pvt.		Govt.	Pvt.
-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12	-13	-14	-15	-16	-17	-18
18	Nil	will be notified	6 months	Nil	Nil	Nil	Nil	will be notified	Nil	Six months	Nil	4	Nil	Nil	1	Nil	Nil

Note: The list of the laboratory may be attached separately (Board, State Govt. and Private)

Specific remarks, if any:

PART V: DETAILS OF LABORATORIES PARTICIPATED ON ANALYTICAL QUALITY CONTROL AND QUALITY ASSURANCE CONDUCTED BY CPCB IN RESPECT OF WATER QUALITY PARAMETERS

S. No.	Name of the Laboratory with address	No. of Parameters in AQC Exercise				Number of Parameters Attempted				% Parameters Successful			
		33rd Exercise	34th Exercise	35th Exercise	36th Exercise	33rd Exercise	34th Exercise	35th Exercise	36th Exercise	33rd Exercise	34th Exercise	35th Exercise	36th Exercise
1	Advanced Environmental Laboratory, Tamil Nadu Pollution Control Board, No. 76, Mount Salai, Guindy, Chennai - 600 032.	9	11	-	19	9	9	-	19	77.78%	63.64%	-	57.89%
2	Advanced Environmental Laboratory, Tamil Nadu Pollution Control Board, No. 5, Ramasamy Nagar, Kavundampalayam, Coimbatore - 641030.	9	-	-	18	8	-	-	18	50.00%	-	-	50.00%
3	Advanced Environmental Laboratory, Tamil Nadu Pollution Control Board, Plot No A3, SIPCOT Industrial Complex, Kudikadu, Cuddalore - 607 005.	9	-	-	18	6	-	-	18	33.33%	-	-	94.44%
4	Advanced Environmental Laboratory, Tamil Nadu Pollution Control Board, Survey No.668 & 669, SIDCO Industrial Estate, Kappalure, Thirumangalam (TK) Madurai - 625 008	9	11	-	18	8	11	-	18	44.44 %	18.18 %	-	72.22 %
5	Advanced Environmental Laboratory, Tamil Nadu Pollution Control Board, Sival Tower, 1/276, Meyyanur Main Road, Salem - 636 004	9	11	-	18	9	11	-	18	77.78 %	50 %	-	72.22 %
6	Advanced Environmental Laboratory, Tamil Nadu Pollution Control Board, 30/2, SIDCO Industrial Estate, Pettai, Tirunelveli-10.	-	-	-	18	-	-	-	18	-	-	-	66.67%
7	Advanced Environmental Laboratory, Tamil Nadu Pollution Control Board, No.25, SIDCO Industrial Estate, Developed Plots, Thuvakkudi, Trichy-620 0105.	9	11	-	18	9	11	-	17	83.33%	45.45%	-	94.44%
8	Advanced Environmental Laboratory, Tamil Nadu Pollution Control Board, Auxilium College Road, Gandhi Nagar, Vellore-632 006	9	11	-	18	9	11	-	18	55.56%	27.27%	-	72.22%

9	District Environmental Laboratory, Tamil Nadu Pollution Control Board, No.77A, South Avenue Road, Ambattur Industrial Estate, Ambattur, Chennai - 600058.	-	-	-	18	-	-	-	18	-	-	-	66.67				
10	District Environmental Laboratory, Tamil Nadu Pollution Control Board, Collectorate Complex, Dindigul-624 004	-	-	-	18	-	-	-	18	-	-	-	83.33%				
11	District Environmental Laboratory, Tamil Nadu Pollution Control Board, Hosur – 635 126 .	-	-	-	18	-	-	-	18	-	-	-	44.44%				
12	District Environmental Laboratory, Manali@Arumbakkam Tamil Nadu Pollution Control Board, 950/1, Poonamallee High Road, Arumbakkam, Chennai- 600 106.	-	-	-	18	-	-	-	17	-	-	-	61.11%				
13	District Environmental Laboratory, Tamil Nadu Pollution Control Board, Maraimalai Nagar, Chengalpattu.	-	-	-	18	-	-	-	18	-	-	-	61.11%				
14	District Environmental Laboratory, Tamil Nadu Pollution Control Board, Plot No:J-2(W), SIPCOT Industrial Growth Centre, Perundurai - 638 052.	-	-	-	18	-	-	-	18	-	-	-	72.22%				
15	District Environmental Laboratory, Tamil Nadu Pollution Control Board, C7 & C9 SIPCOT Industrial Complex, Meelavittan, Thoothukudi - 628 008	-	-	-	18	-	-	-	18	-	-	-	72.22%				
16	District Environmental Laboratory, Tamil Nadu Pollution Control Board, Kumaran Complex, 2nd Floor, Kumaran Road, Tiruppur – 641 601.	-	-	-	18	-	-	-	18	-	-	-	77.78%				

Note: 33rd Exercise (Metals) held in 2020-2021,
 34th Exercise (General and Physico-Chemical parameters) held in 2021-2022
 35th Exercise (Pesticides) held in 2023
 36th Exercise (General and Physico-Chemical parameters) held in 2023-2024

Provide details of each Laboratories (Central, Regional/Zonal, District) in separate Row

Specific remarks, if any:

PART VI: DETAILS OF LABORATORIES PARTICIPATED ON PROFICIENCY TESTING (PT) PERFORMANCE
 (Information to be given for last 3 years)

S. No.	Name of Laboratory with address	Year of PT participation	PT Sample Provider (Name and Address)	Number of Parameters in Accreditation Scope	Number of Parameters for which Laboratory participated in PT exercise	Number of Parameter with Satisfactory Results
1	Advanced Environmental Laboratory, No. 76, Mount Salai, Guindy, Chennai – 32	2022	M/s. Horizon Analytical Laboratory Pvt. Ltd., K ¾, S.No.10, Erandawane Housing Society, Opp. Deenanath Mangeshkar Hospital, Pune – 411 004.	114	13	13-satisfactory
			M/s. Global PT Provider Pvt. Ltd., F-89/22, Okhla Industrial Area, Phase-I, New Delhi – 110 020.	114	13	13-satisfactory
		2023	M/s. Green Economy Initiatives (P) Ltd., 215 Silver City (Main), Zirakpur (Dt.) SAS Nagar (Mohali), Punjab – 140603.	114	11	11-satisfactory
		2024	-	-	-	-

List of CAAQM Station of TNPCB			
S.N.	District	CAAQM station Located Near by Laboratory	Location
1	Ariyalur	AEL, Trichy,	DEE Office, TNPCB
2	Chengalpattu (Vandalur)	DEL, MM Nagar,	B.S Abdur Rahman University
3	Chennai (Kodungaiyur)	DEL, Manali	Private Building No.23 Sreenivasan Street Krishnamoorthi Nagar, Kodungayur 600118
4	Chennai (Koyambedu)	DEL, Manali	S2, 4&5, Murugesan Street, Balavinayagar Nagar, Arumbakkam. Chennai 600106
5	Chennai (Perungudi)	AEL, Chennai	1/465, 6th Cross Street, Sri Sai Nagar, Thurai Pakkam, Chennai 600096
6	Chennai (Royapuram)	DEL, Manali,	Tirumalai Chemicals
7	Coimbatore	AEL, Coimbatore	Kuruchi-SIDCO
8	Coimbatore	AEL, Coimbatore	PSG College of Arts & Science
9	Cuddalore (Semmendalam)	AEL, Cuddalore	29/23, Nellikuppam main Road, Semmendalam, Near Anchaneayar Temple, Cuddalore, Tamil Nadu, 6077001
10	Cuddalore (SIPCOT)	AEL, Cuddalore	DEE Office, TNPCB
11	Dindigul	DEL, Dindigul	PSNA Infosys
12	Hosur	DEL, Hosur	DEE Office, TNPCB
13	Kanchipuram	DEL, Oragadam	Tirumalai Engineering College
14	Karur	AEL, Trichy	Asian Fabric Private Limited
15	Madurai	AEL, Madurai	DEE Office, TNPCB
16	Nagapattinam	DEL, Nagapattinam	DEE Office, TNPCB
17	Namakkal	AEL, Salem	Selvam Institute of Technology
18	Ooty	AEL, Coimbatore	Aavin Milk Factory
19	Perundurai	DEL, Perundurai	SIPCOT
20	Pudukkottai	AEL, Trichy	DEE Office, TNPCB
21	Ramanathapuram	AEL, Madurai	Government Hospital
22	Ranipet, SIPCOT	AEL, Vellore	3/431, 5th Street, VOC Nagar, SIPCOT Ranipet, Tamil Nadu 632 403
23	Salem	AEL, Salem	Sona College of technology
24	Thanjavur	AEL, Trichy	DEE Office, TNPCB
25	Thiruvallur (Gummidipoondi)	DEL, Ambattur	DEE Office, TNPCB
26	Thiruvallur (Kathivakkam)	DEL, Manali	Government Primary Health Care centre
27	Thiruvallur (Manali)	DEL, Manali	Government School
28	Thoothukudi	DEL, Thoothukudi	1A/175D, Meelavttan Main, Thoothukudi 628008.
29	Tirunelveli	AEL, Tirunelveli	Tirunelveli Municipal Corporation Office
30	Tiruppur	DEL, Tiruppur	Tiruppur Kumaran College for Women
31	Trichy (City)	AEL, Trichy	St Joseph College
32	Trichy (Rural)	AEL, Trichy	Bahrathidasan university
33	Vellore	AEL, Vellore	Khannan mahal
34	Virudhunagar	AEL, Madurai	DEE Office, TNPCB

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,
PRINCIPAL BENCH, NEW DELHI

Original Application No. 693/2023

News Item titled "Pollution Control Boards
are the weak link" appearing in Deccan Herald
dated 24.10.2023.

-Vs-

State of Andhra Pradesh through Principal Secretary,
Department of Environment and Forest
And others.

.....Respondents.

VAKALATNAMA

I M. Saravanakumar, Son of Mr.R.Mahalingam, aged about 60 years, having office at No. 76, Mount Salai, Guindy, Chennai-600 032, on behalf of TNPCB Petitioner(s) / Appellant(s) / Respondent(s) in the above Application do hereby appoint and retain **Ms. Purnima Krishna**, Advocate on Record, for the State of Tamil Nadu, National Green Tribunal, New Delhi to act and appear for me in the above Petition and on my behalf to conduct and prosecute (or defend) the same and all proceedings that may be taken in respect of any application connected with the same or any decree or order passed therein including proceeding in taxation and application for Review, to file and obtain return of documents, and to deposit and receive money on my/our behalf in the said Petition and in applications for Review and to represent me/us and to take all necessary steps on our behalf in the above matter. I agree to all act done by the aforesaid Advocate in pursuance of this authority.

Dated this 07..... day of January, 2026.

ACCEPTED AND IDENTIFIED


MEMBER SECRETARY
TAMILNADU POLLUTION CONTROL BOARD
76, MOUNT SALAI, CHENNAI-600 032.



PLAINTIFF(S)/APPELLANT(S)/PETITIONER(S)/DEFENDANT(S)/
OPPOSITE PARTY INTERVENOR NO.....RESPONDENT(S)

(Purnima Krishna)
Advocate-on-Record

MEMO OF APPEARENCE

To
The National Green Tribunal
Principal Bench, New Delhi.

Dear Sir,

Please enter my appearance in the above-mentioned Original Application made on behalf of the Respondent Tamil Nadu Pollution Control Board

Yours faithfully

Place:New Delhi
Dated: 07.01.2026.



Purnima Krishna
Advocate-on-Record
(AOR Code: 2741)

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Status Report - TNPCB - O.A.No.693 of 2023

purnima krishna <purnimakrishna10@gmail.com>

Wed, Jan 7, 2026 at 12:33 PM

To: lawchambers@sgovil.com, "arschauhan.co@gmail.com" <arschauhan.co@gmail.com>, amit_chauhan001@hotmail.com

Dear Sir/Ma'am,

Please find attached a copy of the Status Report filed on behalf of the Tamil Nadu Pollution Control Board in the captioned matter.

Please treat this as service of the same.

Thanking You,

Kind Regards,

Purnima Krishna,

Advocate-on-Record,

Supreme Court of India,

340, New Lawyers' Chambers,

M.C. Setalvad Block,

Bhagwan Das Road

New Delhi - 110 001

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