Initial Environmental Examination

Document Stage: Draft for Consultation
Project Number: 49107-009
June 2021

INDIA: Integrated Urban Flood Management for the Chennai - Kosasthalaiyar Basin Project – PART C

Prepared by Greater Chennai Corporation (GCC) for the Asian Development Bank.

Water Quality Results – Surface Water

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)			
			pH	DO mg/L	BOD mg/L	Fecal Coliform

Water Quality Results – Ground Water

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)						
			pH	TDS	Total Hardness	Sulphate	Chloride	Fe	Pb

Site No.	Date of Sampling	Site Location	Parameters (Monitoring Results)						
			pH	TDS	Total Hardness	Sulphate	Chloride	Fe	Pb

Noise Quality Results

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Government Standard)	
			Day Time	Night Time

SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS

- Summary of follow up time-bound actions to be taken within a set timeframe.
- Photos
- Summary of consultations
- Copies of environmental clearances and permits
- Sample of the environmental site inspection report
- Other

SAMPLE ENVIRONMENTAL SITE INSPECTION REPORT

Project Name

Contract Number

NAME: _____ DATE: _____
TITLE: _____ DMA: _____
LOCATION: _____ GROUP: _____

WEATHER CONDITION:
_____

INITIAL SITE CONDITION:
_____

CONCLUDING SITE CONDITION:

Satisfactory _____Unsatisfactory _____Incident _____Resolved _____Unresolved _____

INCIDENT:
Nature of
incident:_____

Intervention Steps:
_____

Incident Issues

Resolution

Project Activity Stage	Survey	
	Design	
	Implementation	
	Pre-Commissioning	
	Guarantee Period	

Inspection

Emissions	Waste Minimization
Air Quality	Reuse and Recycling
Noise pollution	Dust and Litter Control
Hazardous Substances	Trees and Vegetation

Site Restored to Original Condition Yes [ ] No [ ]

Signature
_____

Sign off

_____	_____
Name	**Name**
Position	**Position**

STAKEHOLDER CONSULTATION

The stakeholder consultation meeting was held on 06.11.2017 at the conference hall of Greater Chennai Corporation. The meeting was chaired by the Dr. D. Karthikeyan I.A.S., Commissioner, Greater Chennai Corporation. It was attended by all relevant officials from GCC, PWD, CMWSSB, TNEB & TNUIFSL, NGOs, Members from various associations, Residents & General public from relevant zones.

Photographs - Stakeholders Meeting

Dr. Karthikeyan I.A.S., Commissioner, Greater Chennai Corporation chairing the session.

VOYANTS Consultants (DPR consultants) explaining the project.

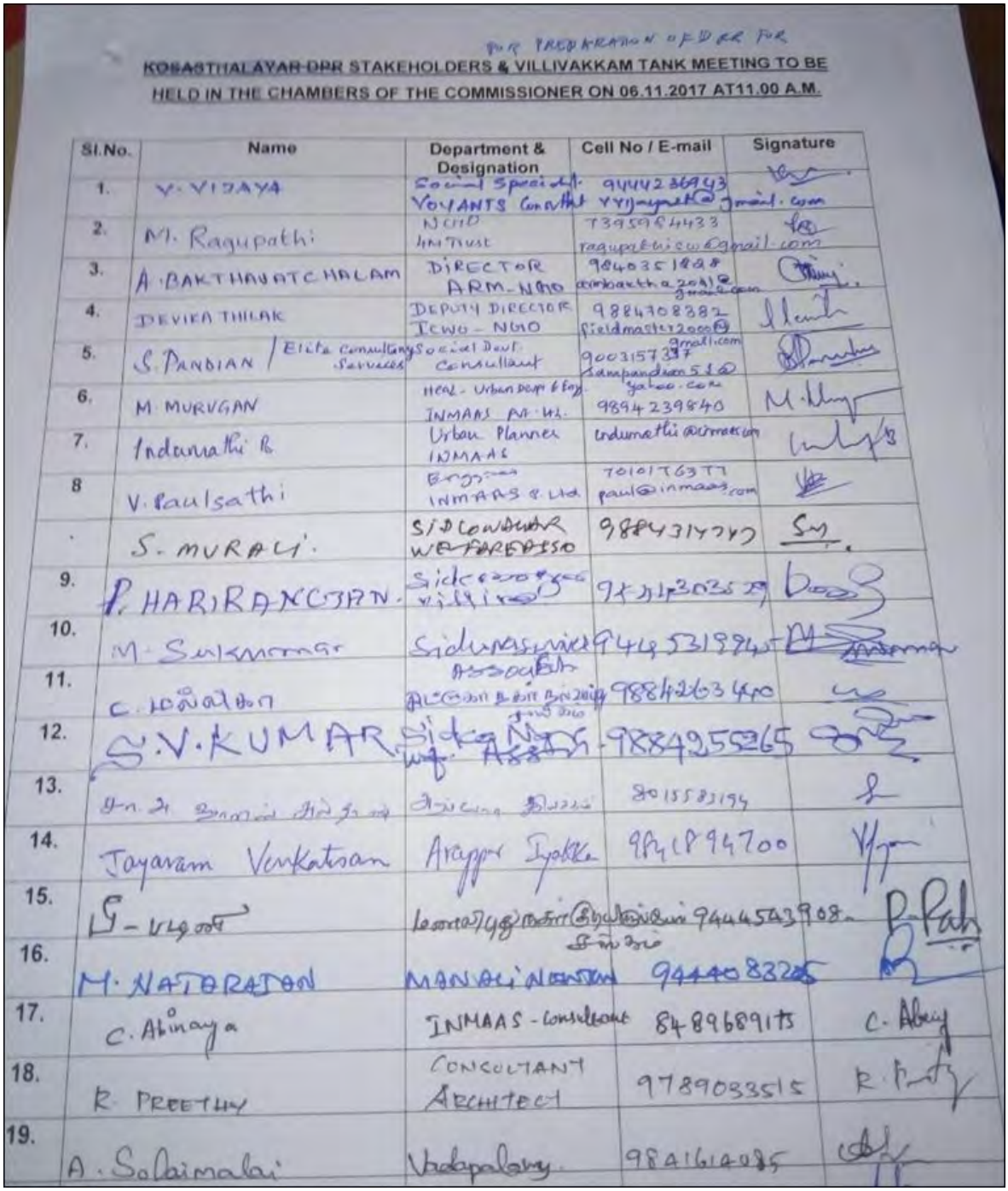
NGOs and Consultants participation

Public participation in the meeting

Public expressing views to the Commissioner, GCC

Participants expressing their views

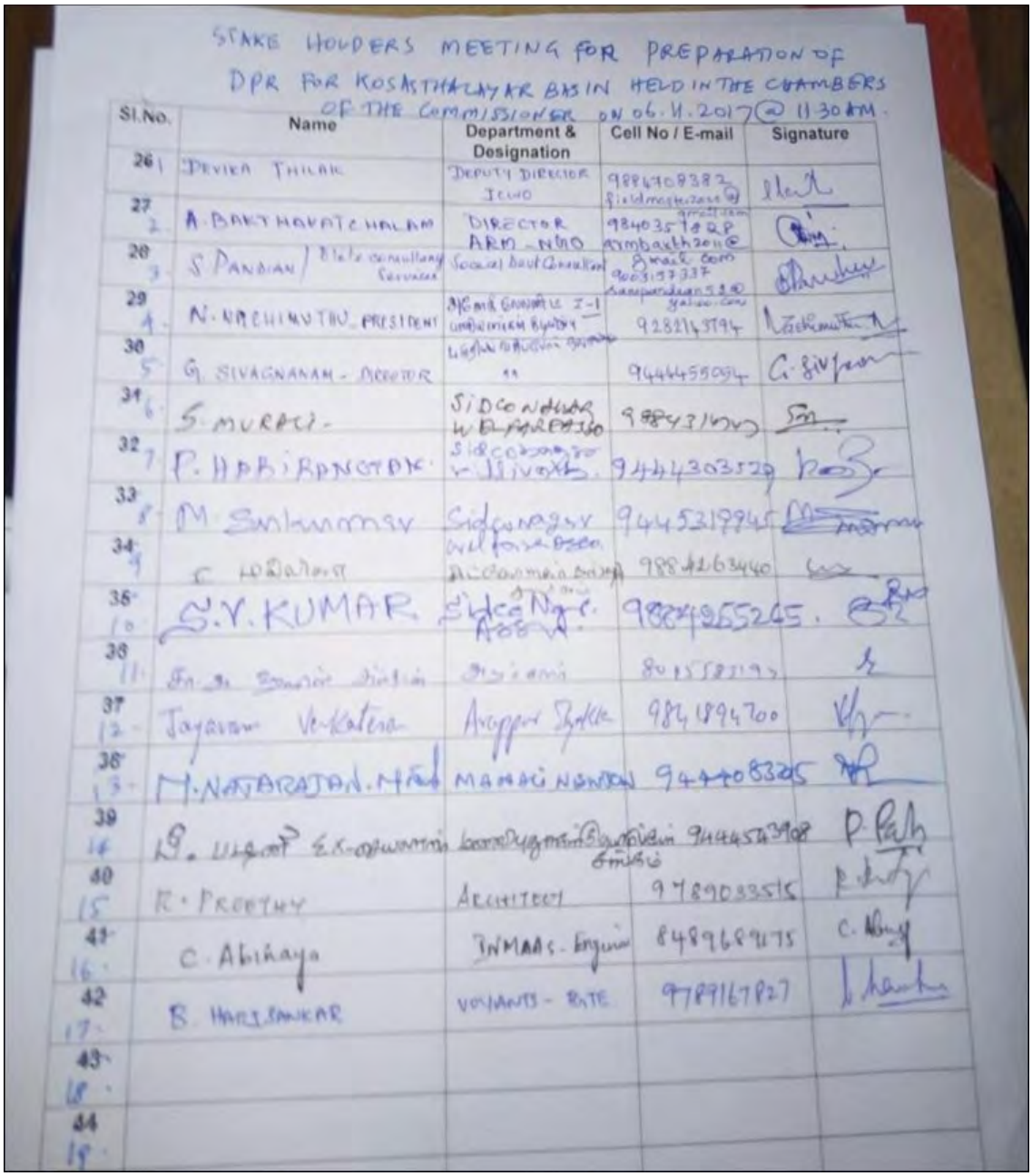
Attendance - Stakeholders Meeting



FOR PREPARATION OF DPR FOR

KOSASTHALAYAR DPR STAKEHOLDERS & VILLIVAKKAM TANK MEETING TO BE HELD IN THE CHAMBERS OF THE COMMISSIONER ON 06.11.2017 AT11.00 A.M.

Sl.No.	Name	Department & Designation	Cell No / E-mail	Signature
1.	V. VIJAYA	Social Specialist, VOLANTS Consultancy	9444236943 yvijayaeth@gmail.com	
2.	M. Ragupathi	NCHD Institute	7395984433 ragupathi.sw@gmail.com	
3.	A. BAKTHAVATCHALAM	DIRECTOR ARM-NGO	9840351888 armbaktha2011@gmail.com	
4.	DEVIKA THILAK	DEPUTY DIRECTOR ICWO - NGO	9884708382 fieldmaster12000@gmail.com	
5.	S. PANDIAN / Elita Consultancy Services	Social Devt. Consultant	9003157397 sampandian516@yahoo.com	
6.	M. MURUGAN	HEAD - Urban Deptt & Fgn. INMAAS Pvt. Ltd.	9894239840	
7.	Indumathi R	Urban Planner INMAAS	indumathi@inmaas.com	
8	V. Paulsathi	Engineer INMAAS P. Ltd.	7010176377 paul@inmaas.com	
	S. MURALI.	SIDCO WELFARE OFFICER	9884314747	
9.	P. HARIRANGAN.	Sidco [illegible]	9[illegible]3025	
10.	M. Sulochana	Sidco [illegible] Association	9445318940	
11.	C. [illegible]	[illegible]	9884263440	
12.	S.V. KUMAR	Sidco Nagar Welf. Assn.	9884255265	
13.	[illegible]	[illegible]	8015583194	
14.	Jayaram Venkatraman	Arappor Iyakkam	9841894700	
15.	[illegible]	[illegible]	9444543908	
16.	M. NATARAJAN	MANALI [illegible]	9444083205	
17.	C. Abinaya	INMAAS - Consultant	8489689175	
18.	R. PREETHY	CONSULTANT ARCHITECT	9789033515	
19.	A. Sulaimalai	Vadapalany	9841614035	



STAKE HOLDERS MEETING FOR PREPARATION OF DPR FOR KOSASTHALAYAR BASIN HELD IN THE CHAMBERS OF THE COMMISSIONER ON 06.11.2017 @ 11.30 AM.

Sl.No.	Name	Department & Designation	Cell No / E-mail	Signature
26	DEVIEN THILAK	DEPUTY DIRECTOR ICWO	9884708382 fieldmgtchennai@	
27 2	A. BAKTHAVATCHALAM	DIRECTOR ARM - NMO	9840351482 armbakth2011@	
28 3	S. PANDIAN / Water consultancy Services	Social Development	gmail.com 9003197337	
29 4	N. VAIDHINATHAN, PRESIDENT		9282143794	
30 5	G. SIVAGNANAM - DIRECTOR		9444455094	
31 6	S. MURALI -	SIDCO NAGAR WELFARE OFFICE	9884316747	
32 7	P. HARIHARAN	SIDCO NAGAR WELFARE OFFICE	9444303529	
33 8	M. SWAMINATHAN	SIDCO NAGAR WELFARE OFFICE	9445319945	
34 9	[illegible]	[illegible]	9884263440	
35 10	S.V. KUMAR	SIDCO Nagar A&B	9884965245	
36 11	[illegible]	[illegible]	8015583193	
37 12	Jayaram Venkatesa	Arappor Iyakkam	9841894700	
38 13	M. NATARAJAN. MLA	MANAGING TRUSTEE	9444083205	
39 14	G. [illegible]	[illegible]	9444543908	
40 15	K. PREETHY	ARCHITECT	9789033515	
41 16	C. Abinaya	INMAAS - Engineer	8489689475	
42 17	B. HARISANKAR	VOLUNTEER - RATE	9789167827	
43 18				
44 19				

Minutes of the Meeting held on 06.11.2017 in the Commissioner's Conference Hall, First Floor, Ripon Buildings for the Following Assignment :

Stakeholder Consultation Meeting for Revised Detailed Project Report for Integrated Storm Water Drains for the Kosasthalaiyar Basin.

In the Chair : Dr. D. Karthikeyan, I.A.S.,
Commissioner, Greater Chennai Corporation

List of Participants

1. Mr. Govinda Rao, I.A.S., Deputy Commissioner (Works) /GCC
2. Mr. M. Pugazhendhi, Principal Chief Engineer/GCC
3. Mr. L. Nandakumar, Superintending Engineer, SWD, Spl Projects/GCC
4. Mr.E. Ayyanar Bharathi, Superintending Engineer, CMWSSB
5. Mr. Seralathan, Superintending Engineer, TNEB
6. Mr. Jamaluddin, Asst. Executive Engineer, PWD
7. Mr. D. Selva Pandian, Senior Assistant Vice President/TNUIFSL
8. Mr. U. Vijayaraghavan, Senior Manager/TNUIFSL
9. Mr. A. Bakthavatchalam, Director ARM-NGO
10. Mr. S. Pandian, Elite Social Consultancy Services
11. Ms. Nandhini, Uravugal, NGO
12. President, Ashok Leyland Officers Resident Association
13. Members, Sidco nagar Welfare Association
14. Mr. Harish Sultan, Arapor Iyakkam
15. Mr. Jayaram Venkatesan, Arapor Iyakkam
16. Members, Manali New Town Association
17. Residents of Villivakkam
18. Mr. B.R. Saravanamurthy , Executive Engineer/SWD/GCC
19. Mr. B. Sivakumar, Executive Engineer/SWD/GCC
20. Voyant Consultants

Voyants Solutions Pvt. Ltd., has given detailed power point presentation and explained the details of the drains and the water bodies inside the project area. The project background, present and future scenario of the project, general arrangement of proposed canals and improvement proposal for the water bodies were explained. The water logging areas and the narrow stretches of the outlets and inlets in various locations of the project area was explained. Various benefits like flood management, reduction in water logging, removal of encroachments, etc were put forth in the meeting.

Suggestions/Comments of Stakeholders

After the PowerPoint presentation, the Commissioner, Greater Chennai Corporation has invited the stakeholders to give their suggestions and comments on the project. The details of the queries raised by stakeholders and replies made in the DPR preparation stage are given below.

I.Clarifictions sought by Arappor Iyakkam (NGO)

1. Construction of the drains should be enough to carry the required volume of the storm water during rainy seasons.
2. RCC drains shall be replaced by brick wall drains and with earthen base so that the water will percolate inside the ground.
3. Prevention of illegal sewer into storm water drains.
4. If any encroachments found along the narrow sections/mouth of the canals that has to be removed.
5. Whether all the water bodies will be integrated into ISWD project.
6. Whether the design considers the invert levels of the area.

The Superintending Engineer/SWDD has explained that

- The drains were designed scientifically based on the rainfall data analysis for the past 30 year's rainfall data. The capacity of the drains shall carry the water during rainy days.
- RCC drains were selected based on the standards approved by Ministry of Urban Development Department and he explained that the same has been used for Integrated Storm Water Drains for Adyar and Cooum basin as brick wall drains collapse easily and allowing sewer to mix with rainwater.
- There will be provision of sunken wells and gutters provisions once in 30m along the drains to ensure ground water percolations.
- Illegal sewers will be prevented, once the GCC covers certain areas with underground drainage, individual household connections are still not made in certain places. Once the work is completed, illegal sewer will not be allowed to let into rain water drains.
- If any encroachments found, along the narrow junction and mouth of drains, they will be removed and the affected families will be mitigated as per ESMF guidelines.
- Detailed studies were conducted to ensure maximum number of water bodies to integrate with ISWD project and rest of them will be retained as rain water storage/recharge tanks.
- Detailed studies were conducted and modelling exercises were carried out by the DPR consultants to ensure smooth flow of storm water by maintaining proper invert levels of drain connected to water bodies.

II. Clarifications sought by Uravugal (NGO)

1. The mitigation measures of displaced people

➢ The Social Safeguard Specialist of the consultant has explained that the displaced and project affected families will be mitigated as per ESMF policy framework.

III.Clarification sought by 4M trust (NGO)

1. The accommodation details and methodology of the displaced people alternate houses provisions.

➢ The Social Safeguard Specialist of the consultant has explained that the project affected families and displaced families shall be resettled, rehabilitated and mitigated as per ESMF policy framework.

IV.Queries raised by Residential Associations

1. Whether all the inlets and outlets of the water bodies were studied.

➢ The DPR Technical expert explained that all the inlets and outlets were studied in detail and proposals has been prepared for additional number of inlet and outlet for the water bodies.

2. What arrangements will be made for removal of trees along the drains

➢ The Environmental Specialist of the consultant has explained that for trees identified along the drains, realignment will be suggested and if any tree identified for felling, compensatory tree plantation will be made at the rate of 1; 10 ratio.

3. What arrangement will be made for enhancement of existing lakes.

➢ The consultants have explained that for major water bodies, deepening and desilting proposals were recommended. For minor tanks bund improvement and walk paths will be recommended.

V. Queries raised by Public

1. What arrangements will be made to avoid water logging problem in Kargil nagar areas?
2. Whether the DPR will consider providing solutions to water logging areas?
3. Whether people will be removed from existing houses without priror intimation

➢ The Consultant Technical expert has explained that all water logging areas were identified and studied along with the Flood Inundation studies

made by Anna University and incorporated in the design to prevent areas from water logging during rainy season and flood time.

- For the Kargil Nagar area and other similar surrounding places, the design team has proposed for a storm water pumping station at few locations to avoid water logging.

- The Social Safeguard Specialist of the consultant has explained that the project affected families and displaced families shall be resettled, rehabilitated and mitigated as per ESMF policy framework with prior intimation.

The meeting was concluded with final note from the Commissioner that consultant has to proceed further for the preparation of Final DPR incorporating all feasible and viable comments given by various stakeholders presented in the meeting.

The Superintending Engineer presented the Vote of Thanks and the meeting winded up with positive perception of the stakeholders.

Executive Engineer/SWD

Superintending Engineer/SWD

Principal Chief Engineer

Deputy Commissioner (Works)

Commissioner

Feedback Forms - Stakeholders Meeting

(2)

FEEDBACK FORM

Stakeholders Meeting

Greater Chennai Corporation

Storm Water Drains Department

Preparation of Revised Detailed Project Report for Providing Integrated Storm Water Drains for the Kosasthalaiyar Basin

Date; 06/11/2017 Venue: Greater Chennai Corporation Time: 11.00 am

Name: Devika thilak

Gender : *Male / Female*

Address and Contact No: Deputy director ICWD - NGO
Cell:- 9884708382

1. Whether the project has been explained to you in detail?
   Yes / No
2. Whether you welcome the project which benefits your locality?
   Yes / No
3. Whether the project will benefit you?
   Yes / No
4. If Yes, in what way the project will benefit you?
   Integrating the drains along the Kosasthalaiyar basin is welcomeable project. the low laying areas will be benefited
5. Any other Comments / Views / Suggestions (if any)
   The canals inlet and outlets shall be widened. Some of the tanks the mouth is encroached with settlements.

Signature

(3)

FEEDBACK FORM

Stakeholders Meeting

Greater Chennai Corporation

Storm Water Drains Department

Preparation of Revised Detailed Project Report for Providing Integrated Storm Water Drains for the Kosasthalaiyar Basin

Date; 06/11/2017 Venue: Greater Chennai Corporation Time: 11.00 am

Name: Siva Kumar

Gender : *Male / Female*

Address and Contact No: No-6, Perumal Thappan St, Madhavaram.

1. Whether the project has been explained to you in detail?
   Yes / No
2. Whether you welcome the project which benefits your locality?
   Yes / No
3. Whether the project will benefit you?
   Yes / No
4. If Yes, in what way the project will benefit you?
   The area will be free from Water logging.
5. Any other Comments / Views / Suggestions (if any)
   Encradments along water bodies (Minor) shall be removed

Sivakumar

Signature

(4)

கருத்து கேட்பு படிவம்

கருத்து கேட்பு கூட்டம்

பெருநகர சென்னை மாநகராட்சி

ஒருங்கிணைந்த மழைநீர் வடிகால் *பிரிவு*

கொசஸ்தலையார் பகுதிக்கான ஒருங்கிணைந்த மழை நீர் வடிகால் விரிவான திட்ட அறிக்கை தயாரித்தல்

இடம் : பெருநகர சென்னை மாநகராட்சி *அலுவலகம்*

தேதி : 06/11/2017 நேரம் : காலை 11. 00 மணி

பெயர்: S. மல்லிகா

பாலர் : *ஆண்* / *பெண்*

முகவரி மற்றும் தொலைபேசி: Sidco Nagar குடியிருப்போர் நலச்சங்கம் 9787463440

1. இத்திட்டம் குறித்து விரிவாக விளக்கப்பட்டதா ? ஆம் / இல்லை
2. இத்திட்டத்தை வரவேறீர்களா? ஆம் / இல்லை
3. இத்திட்டம் தங்களுக்கு பயனுள்ளதா உள்ளதா? ஆம் / இல்லை
4. ஆம் எனில் எவ்வாறு?

   இத்திட்டம் செயல்படுத்தப்பட்டால் எங்கள் பகுதிக்கு நல்லதொரு தீர்வாக அமையும்.

5. தங்களது கருத்து மற்றும் ஆலோசனைகள் (ஏதாவது இருப்பின்)

   கால்வாய்கள் அகலப்படுத்தப்பட வேண்டும்.

   மழைநீர் இருக்கும் தொடர்ச்சியான வடிகால் வசதி ஏற்படுத்தி தரவேண்டும்.

S. மல்லிகா
கையெழுத்து

(6)

கருத்து கேட்பு படிவம்

கருத்து கேட்பு கூட்டம்

பெருநகர சென்னை மாநகராட்சி

ஒருங்கிணைந்த மழைநீர் வடிகால் *பிரிவு*

கொசஸ்தலையார் பகுதிக்கான ஒருங்கிணைந்த மழை நீர் வடிகால் விரிவான திட்ட அறிக்கை தயாரித்தல்

இடம் : **பெருநகர சென்னை மாநகராட்சி** *அலுவலகம்*

தேதி : 06/11/2017 நேரம் : காலை 11. 00 மணி

பெயர்: மேரி

பாலர் : *ஆண்* / *பெண்*

முகவரி மற்றும் தொலைபேசி: கோக்கில் நகர், திருவொற்றியூர்

1. இத்திட்டம் குறித்து விரிவாக விளக்கப்பட்டதா ? ஆம் / இல்லை
2. இத்திட்டத்தை வரவேறீர்களா? ஆம் / இல்லை
3. இத்திட்டம் தங்களுக்கு பயனுள்ளதா உள்ளதா? ஆம் / இல்லை
4. ஆம் எனில் எவ்வாறு?
   இத்திட்டத்தை மிகொண்டு வருவதால் ரங்கள் பகுதி மழைநீர் சூழாமல் இருக்கும் என நம்பிக்கை அளித்துள்ளது
5. தங்களது கருத்து மற்றும் ஆலோசனைகள் (ஏதாவது இருப்பின்)
   மழைநீரை இயந்திரம் மூலமாக வெளியேற்ற வேண்டும்.

மேரி
கையெழுத்து

Newspaper clippings on Stakeholders Meeting

கொசஸ்தலை ஆற்றில் 74 நீர்நிலைகள் இணைப்பு

கழிவுநீர் கலப்பதை கண்டறிய, 'ஸ்மார்ட் மீட்டர்'

– நமது நிருபர் –

கொசஸ்தலை ஆற்று படுகையில் உள்ள, 74 நீர்நிலைகளை ஒன்றோடு ஒன்று இணைத்து, மழை நீரை சேமிக்க, மாநகராட்சி புதிய திட்டம் தயாரித்துள்ளது. இந்த திட்டத்தில், கழிவுநீர் கலப்பதை கண்டறிய, 'ஸ்மார்ட் மீட்டர்' பொருத்த முடிவு செய்யப்பட்டு உள்ளது.

சென்னை மாநகராட்சி விரிவாக்க பகுதிகளில், ஒருங்கிணைந்த மழைநீர் வடிகால் அமைக்க, 4,100 கோடி ரூபாய்க்கு மதிப்பீடு தயாரிக்கப்பட்டுள்ளது.

இதில், 1,100 கோடி ரூபாய் செலவில் கூவம், அடையாறு நீர்பிடிப்பு பகுதிகளில், 320 கி.மீ., நீளத்திற்கு, மழைநீர் வடிகால் அமைக்கும் திட்டத்திற்கு, உலக வங்கி நிதி அளித்தது.

கருத்து கேப்பு

அம்பத்தூர், வளசரவாக்கம், ஆலந்தூர் மண்டலங்கள் பயன்பெறும் இத்திட்ட பணிகள், தற்போது முடியும் நிலையில் உள்ளன.

சோழிங்கநல்லூர், பெருங்குடி மண்டல பகுதிகள் மற்றும் கோவளம் நீர்பிடிப்பு பகுதி ஒருங்கிணைந்த மழைநீர் வடிகால் திட்டத்திற்கு, தொழில் வளர்ச்சி வங்கி நிதி அளிக்க உள்ளது.

திருவொற்றியூர், மணலி, மாதவரம் ஆகிய மண்டலங்களில், ஒருங்கிணைந்த மழைநீர் வடிகால் அமைக்கும் பணிகளுக்கு, ஆசிய வளர்ச்சி வங்கி அல்லது தனியார் வங்கியிடம் கடன் பெற்று, இத்திட்டத்தை செயல்படுத்த முடிவு செய்யப்பட்டு உள்ளது.

இந்த திட்டத்திற்கு, விரிவான திட்ட அறிக்கை தயாரிக்கப்பட்டு உள்ளது. ரிப்பன் மாளிகையில் நேற்று, இந்த திட்டத்திற்கான கருத்து கேட்பு கூட்டம் நடந்தது.

கொசஸ்தலை ஆறு நீர்பிடிப்பு பகுதிகளில், ஒருங்கிணைந்த மழைநீர் வடிகால், மொத்தம், 420 கி.மீ., நீளத்திற்கு அமைக்கப்பட உள்ளது.

இந்த வடிகால் திட்டத்தில், மொத்தம், 74 நீர்நிலைகள் ஒன்றுடன் ஒன்று இணைக்கப்படும். மழைக்காலங்களில், மழைநீர் வடிகால் மூலம் இந்த நீர்நிலைகள் நிரம்பிய பிறகே, உபரிநீர் கொசஸ்தலை ஆற்றுக்கு செல்லும்.

மழைநீர் வடிகாலில் கழிவுநீர் கலந்து வந்தால், அதை நீர்நிலையின் நுழைவு பகுதியிலேயே கண்டறிவதற்கு வசதியாக, ஸ்மார்ட் மீட்டர் பொருத்தப்படும்.

நீரில் கழிவுநீர் கலப்பு தன்மை கூடினால், இந்த மீட்டர் மூலம், ஒருங்கிணைந்த கண்காணிப்பு மற்றும் கட்டுப்பாட்டு மையத்திற்கு தானாக தகவல் கிடைக்கும். மேலும், கழிவுநீர் கலந்து வரும் பாதை, தானாக மூடிக் கொள்ளும்.

மூன்று ஆண்டுகள்

கழிவுநீர் கலப்பதை அதிகாரிகள் தடுத்து நிறுத்திய பின், நீர்நிலைக்கு நீர் செல்லும். இந்த நவீன தொழில்நுட்பம், சென்னையில் முதல் முறையாக, இந்த, 74 நீர்நிலைகளுக்கு செயல்படுத்தப்பட உள்ளது.

இத்திட்டத்தில், நீர்நிலைகளில் குப்பை விழாமல் தடுக்க வேலி அமைப்பது, நடைபாதை அமைப்பது போன்ற பணிகளும் செய்யப்பட உள்ளன.

இத்திட்டத்திற்கு நிதி அளிக்கும் நிறுவனம் முடிவானதும், அடுத்த கட்ட பணிகள் துவங்கும் என்றும், திட்டம் பயன்பாட்டிற்கு வர, இரண்டு முதல் மூன்று ஆண்டுகள் ஆகும் என்றும், மாநகராட்சி அதிகாரிகள் தெரிவித்தனர்.

கொரட்டூர் ஏரி கால்வாய் அகலமாகிறது!

கொரட்டூர் ஏரி நிரம்பி உபரிநீர், செட்டை ஏரிக்கு செல்லும். செட்டை ஏரியில் இருந்து வெளியேறும் உபரிநீர், கொசஸ்தலை ஆறு வழியாக கடலுக்கு செல்லும். கொரட்டூர் ஏரியில் இருந்து, செட்டை ஏரிக்கு செல்லும் கால்வாய், தற்போது பல இடங்களில், 10 அடி அகலத்தில் மட்டுமே உள்ளது.

இதனால், மழைக்காலங்களில் குடியிருப்பு பகுதிகளுக்குள் தண்ணீர் புகுந்துவிடுகிறது. இப்பிரச்னைக்கு தீர்வாக, கொரட்டூர் ஏரியில் இருந்து செட்டேரி வரை, 20 அடி அகலத்திற்கு, ஒரே சீரான கால்வாய் அமைக்கவும் மாநகராட்சி திட்டம் வகுத்துள்ளது.

The Dinamalar Newspaper dated 07.11.2017

Environmental Quality Monitoring Test Results

Groundwater Test Results

TEST REPORT

Report Number and date	**CTL/CH/N-9616/2017-18 & 07.02.2018**		
Sample Number	**N-9616/17-18**		
Customer Name & Address	**M/s. Voyants Solutions Pvt. Ltd.,**		
	No. 323, Level 4, Diamond Dune, Poonamallee High Road, Aminjikarai, Chennai - 600029		
SAMPLE DETAILS			
Sample Description By Customer	**Ground Water**		
Sampling Location	Ambattur (Handpump) (Sample ID: AMB-GRD-001)		
GPS Reading	13° 6'26.79"N, 80° 9'13.11"E		
Sampling Date	23.01.2018	**Sampled By**	Chennai Testing Laboratory Pvt. Ltd.,
Quantity Received	5 Litres	**Sampling Method**	CTL/MSP/5.7/001
Date of Receipt	23.01.2018	**Sample Condition**	Good & Received in Plastic Container
Analysis Starting Date	24.01.2018	**Analysis Completion Date**	06.02.2018

Test Results:

The above sample tested as received, and results are as follows:

S. NO	PARAMETERS	METHOD	UNITS	RESULTS	Limits As per IS 10500:2012	
					Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate source
1	pH @ 25°C	IS 3025 (Part 11)-1983 (R.2006)	-	6.8	6.5 - 8.5	No relaxation
2	Suspended Solids	2540-D- APHA 22nd Ed.2012	mg/l	< 2	-	-
3	Total Dissolved Solids	IS 3025 (Part 16)-1984 (R.2006)	mg/l	1064	Max. 500	Max. 2000
4	Total Residual Chlorine	IS 3025 (Part 26)-1986 (R.2003)	mg/l	BDL(DL:0.1)	-	-
5	Ammonical Nitrogen as N	4500-NH_3-B,C-APHA 22nd Ed.2012	mg/l	BDL(DL:0.1)	-	-
6	Total Kjeldahl Nitrogen as N	4500-N-B,C-APHA 22 nd Ed. 2012	mg/l	BDL(DL:0.1)	-	-
7	Free Ammonia as NH_3	4500-NH_3-B,C-APHA 22nd Ed.2012	mg/l	BDL(DL:0.1)	-	-
8	Hexavalent Chromium as Cr^{6+}	3500-Cr-B-APHA 22 nd Ed. 2012	mg/l	BDL(DL:0.01)	-	-
9	Cyanide as CN	4500-CN-C,E-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	Max. 0.05	No relaxation
10	Iron as Fe	IS 3025 (Part 53)-2009	mg/l	0.05	Max. 0.3	No relaxation
11	Chloride as Cl^-	IS 3025 (Part 32)-1988 (R.2009)	mg/l	255	Max. 250	Max. 1000
12	Fluoride as F	IS 3025 (Part 60)-2008	mg/l	0.20	Max. 1.0	Max. 1.5
13	Nitrate as NO_3	IS 3025 (Part 34)-1988 (R.2003)	mg/l	32.4	Max. 45	No relaxation
14	Sulphate as SO_4	IS 3025 (Part 24)-1986 (R.2009)	mg/l	104	Max. 200	Max. 400
15	Phenolic Compounds as C_6H_5OH	IS 3025 (Part 43)-1992 (R.2009)	mg/l	BDL(DL:0.001)	Max. 0.001	Max. 0.002
16	Boron as B	IS 3025 (Part 57)-2005	mg/l	BDL(DL:0.1)	Max. 0.5	Max. 1.0
17	Biochemical Oxygen Demand (BOD) 3 days @ 27°C	5210-B APHA 22 nd Ed. 2012	mg/l	< 2	-	-
18	Chemical Oxygen Demand (COD)	5220-B- APHA 22 nd Ed. 2012	mg/l	< 4	-	-
19	Oil & Grease	5520-O&G-B APHA 22 nd Ed. 2012 (Partition Gravimetric Method)	mg/l	< 2	-	-
20	Dissolved Phosphate as P	4500-P-B,D-APHA 22 nd Ed. 2012	mg/l	BDL(DL:0.1)	-	-
21	Sulphide as S	4500-S^2-F-APHA 22 nd Ed. 2012 (Iodometric Method)	mg/l	BDL(DL:0.01)	Max. 0.05	No relaxation
22	Bio – Assay (Zebra Fish) Test	IS 6582 (Part 2): 2001	-	$T_f = 1$	-	-
23	Arsenic as As	3114-B-APHA 22nd Ed. 2012	mg/l	BDL(DL:0.001)	Max.0.01	Max. 0.05
24	Cadmium as Cd	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.002)	Max. 0.003	No relaxation
25	Copper as Cu	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.02)	Max. 0.05	Max. 1.5
26	Lead as Pb	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.005)	Max. 0.01	No relaxation
27	Mercury as Hg	3112-B-APHA 22nd Ed. 2012	mg/l	BDL(DL:0.001)	Max. 0.001	No relaxation
28	Nickel as Ni	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	Max. 0.02	No relaxation
29	Zinc as Zn	3111-B-APHA 22nd Ed.2012	mg/l	0.36	Max. 5	Max. 15
30	Manganese as Mn	3111 B APHA 22 nd Edition 2012	mg/l	1.19	Max.0.1	Max. 0.3
31	Selenium as Se	IS 3025 (Part 56)-2003(R.2009)	mg/l	BDL(DL:0.005)	Max. 0.01	No relaxation
32	Vanadium as V	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	-	-

BDL - Below Detection Limit; DL - Detection limit
Note: IS 10500:2012 (Drinking Water Specification)
REMARKS: The Sample does not meet the requirement of IS 10500:2012 with respect to the parameter "Manganese".

END OF REPORT

For Chennai Testing Laboratory Pvt ltd

Authorised Signatory

TEST REPORT

Report Number and date	**CTL/CH/N-9617/2017-18 & 07.02.2018**		
Sample Number	**N-9617/17-18**		
Customer Name & Address	**M/s. Voyants Solutions Pvt. Ltd.,**		
	No. 323, Level 4, Diamond Dune, Poonamallee High Road, Aminjikarai, Chennai - 600029		
SAMPLE DETAILS			
Sample Description By Customer	**Ground Water**		
Sampling Location	Pattaravakkam (Sample ID: PAT-GRD-001)		
GPS Reading	13° 6'41.30"N, 80°10'1.73"E		
Sampling Date	23.01.2018	**Sampled By**	Chennai Testing Laboratory Pvt. Ltd.,
Quantity Received	5 Litres	**Sampling Method**	CTL/MSP/5.7/001
Date of Receipt	23.01.2018	**Sample Condition**	Good & Received in Plastic Container
Analysis Starting Date	24.01.2018	**Analysis Completion Date**	06.02.2018

Test Results:

The above sample tested as received, and results are as follows:

S. NO	PARAMETERS	METHOD	UNITS	RESULTS	Limits As per IS 10500:2012	
					Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate source
1	pH @ 25°C	IS 3025 (Part 11)-1983 (R.2006)	-	7.7	6.5 - 8.5	No relaxation
2	Suspended Solids	2540-D- APHA 22nd Ed.2012	mg/l	< 2	-	-
3	Total Dissolved Solids	IS 3025 (Part 16)-1984 (R.2006)	mg/l	1812	Max. 500	Max. 2000
4	Total Residual Chlorine	IS 3025 (Part 26)-1986 (R.2003)	mg/l	BDL(DL:0.1)	-	-
5	Ammonical Nitrogen as N	4500-NH_3-B,C-APHA 22nd Ed.2012	mg/l	BDL(DL:0.1)	-	-
6	Total Kjeldahl Nitrogen as N	4500-N-B,C-APHA 22 nd Ed. 2012	mg/l	BDL(DL:0.1)	-	-
7	Free Ammonia as NH_3	4500-NH_3-B,C-APHA 22nd Ed.2012	mg/l	BDL(DL:0.1)	-	-
8	Hexavalent Chromium as Cr^{6+}	3500-Cr-B-APHA 22 nd Ed. 2012	mg/l	BDL(DL:0.01)	-	-
9	Cyanide as CN	4500-CN-C,E-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	Max. 0.05	No relaxation
10	Iron as Fe	IS 3025 (Part 53)-2009	mg/l	0.08	Max. 0.3	No relaxation
11	Chloride as Cl^-	IS 3025 (Part 32)-1988 (R.2009)	mg/l	570	Max. 250	Max. 1000
12	Fluoride as F	IS 3025 (Part 60)-2008	mg/l	0.21	Max. 1.0	Max. 1.5
13	Nitrate as NO_3	IS 3025 (Part 34)-1988 (R.2003)	mg/l	0.24	Max. 45	No relaxation
14	Sulphate as SO_4	IS 3025 (Part 24)-1986 (R.2009)	mg/l	387	Max. 200	Max. 400
15	Phenolic Compounds as C_6H_5OH	IS 3025 (Part 43)-1992 (R.2009)	mg/l	BDL(DL:0.001)	Max. 0.001	Max. 0.002
16	Boron as B	IS 3025 (Part 57)-2005	mg/l	BDL(DL:0.1)	Max. 0.5	Max. 1.0
17	Biochemical Oxygen Demand (BOD) 3 days @ 27°C	5210-B APHA 22 nd Ed. 2012	mg/l	< 2	-	-

18	Chemical Oxygen Demand (COD)	5220-B- APHA 22 nd Ed. 2012	mg/l	< 4	-	-
19	Oil & Grease	5520-O&G-B APHA 22 nd Ed. 2012 (Partition Gravimetric Method)	mg/l	< 2	-	-
20	Dissolved Phosphate as P	4500-P-B,D-APHA 22 nd Ed. 2012	mg/l	BDL(DL:0.1)	-	-
21	Sulphide as S	4500-S^2-F-APHA 22 nd Ed. 2012 (Iodometric Method)	mg/l	BDL(DL:0.01)	Max. 0.05	No relaxation
22	Bio – Assay (Zebra Fish) Test	IS 6582 (Part 2): 2001	-	$T_f = 1$	-	-
23	Arsenic as As	3114-B-APHA 22nd Ed. 2012	mg/l	BDL(DL:0.001)	Max.0.01	Max. 0.05
24	Cadmium as Cd	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.002)	Max. 0.003	No relaxation
25	Copper as Cu	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.02)	Max. 0.05	Max. 1.5
26	Lead as Pb	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.005)	Max. 0.01	No relaxation
27	Mercury as Hg	3112-B-APHA 22nd Ed. 2012	mg/l	BDL(DL:0.001)	Max. 0.001	No relaxation
28	Nickel as Ni	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	Max. 0.02	No relaxation
29	Zinc as Zn	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.08)	Max. 5	Max. 15
30	Manganese as Mn	3111 B APHA 22 nd Edition 2012	mg/l	BDL(DL:0.01)	Max.0.1	Max. 0.3
31	Selenium as Se	IS 3025 (Part 56)-2003(R.2009)	mg/l	BDL(DL:0.005)	Max. 0.01	No relaxation
32	Vanadium as V	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	-	-

BDL - Below Detection Limit; DL - Detection limit

Note: IS 10500:2012 (Drinking Water Specification)

REMARKS: The Sample does not meet the requirement of IS 10500:2012 with respect to the parameter "Manganese".

END OF REPORT

For Chennai Testing Laboratory Pvt ltd

Authorised Signatory

TEST REPORT

Report Number and date	**CTL/CH/N-9622/2017-18 & 07.02.2018**		
Sample Number	**N-9622/17-18**		
Customer Name & Address	**M/s. Voyants Solutions Pvt. Ltd.,**		
	No. 323, Level 4, Diamond Dune, Poonamallee High Road, Aminjikarai, Chennai - 600029		
SAMPLE DETAILS			
Sample Description By Customer	**Ground Water**		
Sampling Location	Retteri (Sample ID: RET-GRD-001)		
GPS Reading	13° 7'48.21"N, 80°12'59.40"E		
Sampling Date	23.01.2018	**Sampled By**	Chennai Testing Laboratory Pvt. Ltd.,
Quantity Received	5 Litres	**Sampling Method**	CTL/MSP/5.7/001
Date of Receipt	23.01.2018	**Sample Condition**	Good & Received in Plastic Container
Analysis Starting Date	24.01.2018	**Analysis Completion Date**	06.02.2018

Test Results

The above sample tested as received, and results are as follows:

S. NO	PARAMETERS	METHOD	UNITS	RESULTS	Limits As per IS 10500:2012	
					Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate source
1	pH @ 25°C	IS 3025 (Part 11)-1983 (R.2006)	-	7.3	6.5 - 8.5	No relaxation
2	Suspended Solids	2540-D- APHA 22nd Ed.2012	mg/l	< 2	-	-
3	Total Dissolved Solids	IS 3025 (Part 16)-1984 (R.2006)	mg/l	1318	Max. 500	Max. 2000
4	Total Residual Chlorine	IS 3025 (Part 26)-1986 (R.2003)	mg/l	BDL(DL:0.1)	-	-
5	Ammonical Nitrogen as N	4500-NH_3-B,C-APHA 22nd Ed.2012	mg/l	BDL(DL:0.1)	-	-
6	Total Kjeldahl Nitrogen as N	4500-N-B,C-APHA 22 nd Ed. 2012	mg/l	BDL(DL:0.1)	-	-
7	Free Ammonia as NH_3	4500-NH_3-B,C-APHA 22nd Ed.2012	mg/l	BDL(DL:0.1)	-	-
8	Hexavalent Chromium as Cr^{6+}	3500-Cr-B-APHA 22 nd Ed. 2012	mg/l	BDL(DL:0.01)	-	-
9	Cyanide as CN	4500-CN-C,E-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	Max. 0.05	No relaxation
10	Iron as Fe	IS 3025 (Part 53)-2009	mg/l	0.06	Max. 0.3	No relaxation
11	Chloride as Cl^-	IS 3025 (Part 32)-1988 (R.2009)	mg/l	350	Max. 250	Max. 1000
12	Fluoride as F	IS 3025 (Part 60)-2008	mg/l	0.24	Max. 1.0	Max. 1.5
13	Nitrate as NO_3	IS 3025 (Part 34)-1988 (R.2003)	mg/l	17.7	Max. 45	No relaxation
14	Sulphate as SO_4	IS 3025 (Part 24)-1986 (R.2009)	mg/l	230	Max. 200	Max. 400
15	Phenolic Compounds as C_6H_5OH	IS 3025 (Part 43)-1992 (R.2009)	mg/l	BDL(DL:0.001)	Max. 0.001	Max. 0.002
16	Boron as B	IS 3025 (Part 57)-2005	mg/l	BDL(DL:0.1)	Max. 0.5	Max. 1.0
17	Biochemical Oxygen Demand (BOD) 3 days @ 27°C	5210-B APHA 22 nd Ed. 2012	mg/l	< 2	-	-
18	Chemical Oxygen Demand (COD)	5220-B- APHA 22 nd Ed. 2012	mg/l	< 4	-	-
19	Oil & Grease	5520-O&G-B APHA 22 nd Ed. 2012 (Partition Gravimetric Method)	mg/l	< 2	-	-
20	Dissolved Phosphate as P	4500-P-B,D-APHA 22 nd Ed. 2012	mg/l	1.3	-	-
21	Sulphide as S	4500-S^2-F-APHA 22 nd Ed. 2012 (Iodometric Method)	mg/l	BDL(DL:0.01)	Max. 0.05	No relaxation
22	Bio – Assay (Zebra Fish) Test	IS 6582 (Part 2): 2001	-	$T_f = 1$	-	-
23	Arsenic as As	3114-B-APHA 22nd Ed. 2012	mg/l	BDL(DL:0.001)	Max.0.01	Max. 0.05
24	Cadmium as Cd	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.002)	Max. 0.003	No relaxation
25	Copper as Cu	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.02)	Max. 0.05	Max. 1.5
26	Lead as Pb	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.005)	Max. 0.01	No relaxation
27	Mercury as Hg	3112-B-APHA 22nd Ed. 2012	mg/l	BDL(DL:0.001)	Max. 0.001	No relaxation
28	Nickel as Ni	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	Max. 0.02	No relaxation
29	Zinc as Zn	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.08)	Max. 5	Max. 15
30	Manganese as Mn	3111 B APHA 22 nd Edition 2012	mg/l	0.20	Max.0.1	Max. 0.3
31	Selenium as Se	IS 3025 (Part 56)-2003(R.2009)	mg/l	BDL(DL:0.005)	Max. 0.01	No relaxation
32	Vanadium as V	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	-	-

BDL - Below Detection Limit; DL - Detection limit
Note: IS 10500:2012 (Drinking Water Specification)
REMARKS: The Sample does not meet the requirement of IS 10500:2012 with respect to the parameter "Manganese".

END OF REPORT

For Chennai Testing Laboratory Pvt ltd

Authorised Signatory

TEST REPORT

Report Number and date	**CTL/CH/N-9628/2017-18 & 07.02.2018**		
Sample Number	**N-9628/17-18**		
Customer Name & Address	**M/s. Voyants Solutions Pvt. Ltd.,**		
	No. 323, Level 4, Diamond Dune, Poonamallee High Road, Aminjikarai, Chennai - 600029		
SAMPLE DETAILS			
Sample Description By Customer	**Ground Water**		
Sampling Location	Manali (Sample ID: MAN-GRD-001)		
GPS Reading	13°10'2.98"N, 80°15'47.32"E		
Sampling Date	23.01.2018	**Sampled By**	Chennai Testing Laboratory Pvt. Ltd.,
Quantity Received	5 Litres	**Sampling Method**	CTL/MSP/5.7/001
Date of Receipt	23.01.2018	**Sample Condition**	Good & Received in Plastic Container
Analysis Starting Date	24.01.2018	**Analysis Completion Date**	06.02.2018

Test Results

The above sample tested as received, and results are as follows:

S. NO	PARAMETERS	METHOD	UNITS	RESULTS	Limits As per IS 10500:2012	
					Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate source
1	pH @ 25°C	IS 3025 (Part 11)-1983 (R.2006)	-	6.7	6.5 - 8.5	No relaxation
2	Suspended Solids	2540-D- APHA 22nd Ed.2012	mg/l	< 2	-	-
3	Total Dissolved Solids	IS 3025 (Part 16)-1984 (R.2006)	mg/l	2648	Max. 500	Max. 2000
4	Total Residual Chlorine	IS 3025 (Part 26)-1986 (R.2003)	mg/l	BDL(DL:0.1)	-	-
5	Ammonical Nitrogen as N	4500-NH_3-B,C-APHA 22nd Ed.2012	mg/l	0.9	-	-
6	Total Kjeldahl Nitrogen as N	4500-N-B,C-APHA 22 nd Ed. 2012	mg/l	1.3	-	-
7	Free Ammonia as NH_3	4500-NH_3-B,C-APHA 22nd Ed.2012	mg/l	0.32	-	-
8	Hexavalent Chromium as Cr^{6+}	3500-Cr-B-APHA 22 nd Ed. 2012	mg/l	BDL(DL:0.01)	-	-
9	Cyanide as CN	4500-CN-C,E-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	Max. 0.05	No relaxation
10	Iron as Fe	IS 3025 (Part 53)-2009	mg/l	0.09	Max. 0.3	No relaxation
11	Chloride as Cl^-	IS 3025 (Part 32)-1988 (R.2009)	mg/l	716	Max. 250	Max. 1000
12	Fluoride as F	IS 3025 (Part 60)-2008	mg/l	0.21	Max. 1.0	Max. 1.5
13	Nitrate as NO_3	IS 3025 (Part 34)-1988 (R.2003)	mg/l	194	Max. 45	No relaxation
14	Sulphate as SO_4	IS 3025 (Part 24)-1986 (R.2009)	mg/l	207	Max. 200	Max. 400
15	Phenolic Compounds as C_6H_5OH	IS 3025 (Part 43)-1992 (R.2009)	mg/l	BDL(DL:0.001)	Max. 0.001	Max. 0.002
16	Boron as B	IS 3025 (Part 57)-2005	mg/l	BDL(DL:0.1)	Max. 0.5	Max. 1.0
17	Biochemical Oxygen Demand (BOD) 3 days @ 27°C	5210-B APHA 22 nd Ed. 2012	mg/l	< 2	-	-

18	Chemical Oxygen Demand (COD)	5220-B- APHA 22 nd Ed. 2012	mg/l	< 4	-	-
19	Oil & Grease	5520-O&G-B APHA 22 nd Ed. 2012 (Partition Gravimetric Method)	mg/l	< 2	-	-
20	Dissolved Phosphate as P	4500-P-B,D-APHA 22 nd Ed. 2012	mg/l	9.0	-	-
21	Sulphide as S	4500-S^2-F-APHA 22 nd Ed. 2012 (Iodometric Method)	mg/l	BDL(DL:0.01)	Max. 0.05	No relaxation
22	Bio – Assay (Zebra Fish) Test	IS 6582 (Part 2): 2001	-	$T_f = 1$	-	-
23	Arsenic as As	3114-B-APHA 22nd Ed. 2012	mg/l	BDL(DL:0.001)	Max.0.01	Max. 0.05
24	Cadmium as Cd	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.002)	Max. 0.003	No relaxation
25	Copper as Cu	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.02)	Max. 0.05	Max. 1.5
26	Lead as Pb	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.005)	Max. 0.01	No relaxation
27	Mercury as Hg	3112-B-APHA 22nd Ed. 2012	mg/l	BDL(DL:0.001)	Max. 0.001	No relaxation
28	Nickel as Ni	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	Max. 0.02	No relaxation
29	Zinc as Zn	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.08)	Max. 5	Max. 15
30	Manganese as Mn	3111 B APHA 22 nd Edition 2012	mg/l	0.11	Max.0.1	Max. 0.3
31	Selenium as Se	IS 3025 (Part 56)-2003(R.2009)	mg/l	BDL(DL:0.005)	Max. 0.01	No relaxation
32	Vanadium as V	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	-	-

BDL - Below Detection Limit; DL - Detection limit

Note: IS 10500:2012 (Drinking Water Specification)

REMARKS: The Sample does not meet the requirement of IS 10500:2012 with respect to the parameter "Manganese".

END OF REPORT

For Chennai Testing Laboratory Pvt ltd

Authorised Signatory

SILT Sampling Results

TEST REPORT

Report Number and date	**CTL/CH/N-9618/2017-18 & 07.02.2018**		
Sample Number	**N-9618/17-18**		
Customer Name & Address	**M/s. Voyants Solutions Pvt. Ltd.,**		
	No. 323, Level 4, Diamond Dune, Poonamallee High Road, Aminjikarai, Chennai - 600029		
SAMPLE DETAILS			
Sample Description By Customer	**Silt**		
Sampling Location	Ambattur Surplus (Sample ID: AMB-SILT-001)		
GPS Reading	13° 6'51.79"N, 80° 9'58.09"E		
Sampling Date	23.01.2018	**Sampled By**	Chennai Testing Laboratory Pvt. Ltd.,
Quantity Received	2 Kg	**Sampling Method**	CTL/MSP/5.7/002
Date of Receipt	23.01.2018	**Sample Condition**	Good & Received in Packed Condition
Analysis Starting Date	24.01.2018	**Analysis Completion Date**	06.02.2018

Test Results:

The above sample tested as received, and results are as follows:

S. NO	PARAMETERS	METHOD	UNITS	RESULTS
1	Colour	Physical Observation	-	Black and brown
2	Texture	FAO Method(Page No.25)2007	-	Clay
3	Phosphate as PO_4	IS 10158-1982 (RA2003)	mg/kg	388
4	Sodium as Na		mg/kg	267
5	Nitrate	FAO Method 2007	mg/kg	866
6	Iron as Fe	EPA 3050B-1996 ((Rev-2)/EPA 7380 - 1986	%	1.53
7	Chromium as Cr	EPA 3050B-1996 (Rev-2)/EPA 7190-1986	mg/kg	BDL(DL:5.0)
8	Manganese as Mn	EPA 3050 B-1996 (Rev.2)/EPA 7460-1986	mg/kg	209.84
9	Lead as Pb	EPA 3050B-1996 (Rev-2)/EPA 7420-1986	mg/kg	BDL(DL:5.0)
10	Zinc as Zn	EPA 3050B – 1996 (Rev -2)/EPA 7950 - 1986	mg/kg	42.90
11	Copper as Cu	EPA 3050B-1996 (Rev -2)/EPA 7210-1986	mg/kg	33.70
12	Nickel as Ni	EPA 3050B-1996 (Rev -2)/EPA 7520 – 1986	mg/kg	44.71
13	Cobalt as Co	EPA 3050B-1996 (Rev -2)/EPA 7200 – 1986	mg/kg	13.15

BDL - Below Detection Limit; DL - Detection Limit

END OF REPORT

For Chennai Testing Laboratory Pvt ltd

A. Rajkumar

Authorised Signatory

Report Number and date	**CTL/CH/N-9620/2017-18 & 07.02.2018**		
Sample Number	**N-9620/17-18**		
Customer Name & Address	**M/s. Voyants Solutions Pvt. Ltd.,**		
	No. 323, Level 4, Diamond Dune, Poonamallee High Road, Aminjikarai, Chennai - 600029		
SAMPLE DETAILS			
Sample Description By Customer	**Silt**		
Sampling Location	Korattur Surplus (Sample ID: KOR-SILT-001)		
GPS Reading	13° 8'27.73"N, 80°11'47.67"E		
Sampling Date	23.01.2018	**Sampled By**	Chennai Testing Laboratory Pvt. Ltd.,
Quantity Received	2 Kg	**Sampling Method**	CTL/MSP/5.7/002
Date of Receipt	23.01.2018	**Sample Condition**	Good & Received in Packed Condition
Analysis Starting Date	24.01.2018	**Analysis Completion Date**	06.02.2018

Test Results:

The above sample tested as received, and results are as follows:

S.NO	PARAMETERS	METHOD	UNITS	RESULTS
1	Colour	Physical Observation	-	Grey
2	Texture	FAO Method(Page No.25)2007	-	Clay
3	Phosphate as PO_4	IS 10158-1982 (RA2003)	mg/kg	311
4	Sodium as Na		mg/kg	498
5	Nitrate	FAO Method 2007	mg/kg	382
6	Iron as Fe	EPA 3050B-1996 ((Rev-2)/EPA 7380 - 1986	%	2.09
7	Chromium as Cr	EPA 3050B–1996 (Rev-2)/EPA 7190-1986	mg/kg	BDL(DL:5.0)
8	Manganese as Mn	EPA 3050 B-1996 (Rev.2)/EPA 7460-1986	mg/kg	205.09
9	Lead as Pb	EPA 3050B–1996 (Rev-2)/EPA 7420-1986	mg/kg	BDL(DL:5.0)
10	Zinc as Zn	EPA 3050B – 1996 (Rev -2)/EPA 7950 - 1986	mg/kg	25.50
11	Copper as Cu	EPA 3050B-1996 (Rev -2)/EPA 7210-1986	mg/kg	14.46
12	Nickel as Ni	EPA 3050B-1996 (Rev -2)/EPA 7520 – 1986	mg/kg	31.34
13	Cobalt as Co	EPA 3050B-1996 (Rev -2)/EPA 7200 – 1986	mg/kg	17.99

BDL - Below Detection Limit; DL - Detection Limit

*****END OF REPORT*****

For Chennai Testing Laboratory Pvt ltd

A. Raj

Authorised Signatory

TEST REPORT

Report Number and date	**CTL/CH/N-9624/2017-18 & 07.02.2018**		
Sample Number	**N-9624/17-18**		
Customer Name & Address	**M/s. Voyants Solutions Pvt. Ltd.,**		
	No. 323, Level 4, Diamond Dune, Poonamallee High Road, Aminjikarai, Chennai - 600029		
SAMPLE DETAILS			
Sample Description By Customer	**Silt**		
Sampling Location	Puzhal Surplus - 1 (Sample ID: PUZL-SILT-001)		
GPS Reading	13°10'32.83"N, 80°12'8.64"E		
Sampling Date	23.01.2018	**Sampled By**	Chennai Testing Laboratory Pvt. Ltd.,
Quantity Received	2 Kg	**Sampling Method**	CTL/MSP/5.7/002
Date of Receipt	23.01.2018	**Sample Condition**	Good & Received in Packed Condition
Analysis Starting Date	24.01.2018	**Analysis Completion Date**	06.02.2018

Test Results:

The above sample tested as received, and results are as follows:

S. NO	PARAMETERS	METHOD	UNITS	RESULTS
1	Colour	Physical Observation	-	Brown
2	Texture	FAO Method(Page No.25)2007	-	Clay
3	Phosphate as PO_4	IS 10158-1982 (RA2003)	mg/kg	333
4	Sodium as Na		mg/kg	784
5	Nitrate	FAO Method 2007	mg/kg	288
6	Iron as Fe	EPA 3050B-1996 ((Rev-2)/EPA 7380 - 1986	%	2.09
7	Chromium as Cr	EPA 3050B–1996 (Rev-2)/EPA 7190-1986	mg/kg	BDL(DL:5.0)
8	Manganese as Mn	EPA 3050 B-1996 (Rev.2)/EPA 7460-1986	mg/kg	218.46
9	Lead as Pb	EPA 3050B–1996 (Rev-2)/EPA 7420-1986	mg/kg	BDL(DL:5.0)
10	Zinc as Zn	EPA 3050B – 1996 (Rev -2)/EPA 7950 - 1986	mg/kg	20.28
11	Copper as Cu	EPA 3050B-1996 (Rev -2)/EPA 7210-1986	mg/kg	12.37
12	Nickel as Ni	EPA 3050B-1996 (Rev -2)/EPA 7520 – 1986	mg/kg	30.48
13	Cobalt as Co	EPA 3050B-1996 (Rev -2)/EPA 7200 – 1986	mg/kg	16.11

BDL - Below Detection Limit; DL - Detection Limit

END OF REPORT

For Chennai Testing Laboratory Pvt ltd

A. Rajkumar

Authorised Signatory

TEST REPORT

Report Number and date	**CTL/CH/N-9625/2017-18 & 07.02.2018**		
Sample Number	**N-9625/17-18**		
Customer Name & Address	**M/s. Voyants Solutions Pvt. Ltd.,**		
	No. 323, Level 4, Diamond Dune, Poonamallee High Road, Aminjikarai, Chennai - 600029		
SAMPLE DETAILS			
Sample Description By Customer	**Silt**		
Sampling Location	Puzhal Surplus - 2 (Sample ID: PUZL-SILT-002)		
GPS Reading	13°10'50.51"N, 80°15'15.39"E		
Sampling Date	23.01.2018	**Sampled By**	Chennai Testing Laboratory Pvt. Ltd.,
Quantity Received	2 Kg	**Sampling Method**	CTL/MSP/5.7/002
Date of Receipt	23.01.2018	**Sample Condition**	Good & Received in Packed Condition
Analysis Starting Date	24.01.2018	**Analysis Completion Date**	06.02.2018

Test Results:

The above sample tested as received, and results are as follows:

S. NO	PARAMETERS	METHOD	UNITS	RESULTS
1	Colour	Physical Observation	-	Brown
2	Texture	FAO Method(Page No.25)2007	-	Clay
3	Phosphate as PO_4	IS 10158-1982 (RA2003)	mg/kg	850
4	Sodium as Na		mg/kg	747
5	Nitrate	FAO Method 2007	mg/kg	248
6	Iron as Fe	EPA 3050B-1996 ((Rev-2)/EPA 7380 - 1986	%	2.08
7	Chromium as Cr	EPA 3050B–1996 (Rev-2)/EPA 7190-1986	mg/kg	BDL(DL:5.0)
8	Manganese as Mn	EPA 3050 B-1996 (Rev.2)/EPA 7460-1986	mg/kg	124.47
9	Lead as Pb	EPA 3050B–1996 (Rev-2)/EPA 7420-1986	mg/kg	BDL(DL:5.0)
10	Zinc as Zn	EPA 3050B – 1996 (Rev -2)/EPA 7950 - 1986	mg/kg	47.94
11	Copper as Cu	EPA 3050B-1996 (Rev -2)/EPA 7210-1986	mg/kg	15.97
12	Nickel as Ni	EPA 3050B-1996 (Rev -2)/EPA 7520 – 1986	mg/kg	35.62
13	Cobalt as Co	EPA 3050B-1996 (Rev -2)/EPA 7200 – 1986	mg/kg	14.42

BDL - Below Detection Limit; DL - Detection Limit

END OF REPORT

For Chennai Testing Laboratory Pvt ltd

A. Raj

Authorised Signatory

Surface water Test Results

TEST REPORT

Report Number and date	**CTL/CH/N-9619/2017-18 & 07.02.2018**		
Sample Number	**N-9619/17-18**		
Customer Name & Address	**M/s. Voyants Solutions Pvt. Ltd.,**		
	No. 323, Level 4, Diamond Dune, Poonamallee High Road, Aminjikarai, Chennai - 600029		
SAMPLE DETAILS			
Sample Description By Customer	**Surface Water**		
Sampling Location	Surapet Lake (Sample ID: SURA-SURF-001)		
GPS Reading	13° 8'27.84"N, 80°11'23.74"E		
Sampling Date	23.01.2018	**Sampled By**	Chennai Testing Laboratory Pvt. Ltd.,
Quantity Received	5 Litres	**Sampling Method**	CTL/MSP/S.7/001
Date of Receipt	23.01.2018	**Sample Condition**	Good & Received in Plastic Container
Analysis Starting Date	24.01.2018	**Analysis Completion Date**	06.02.2018

Test Results

The above sample tested as received, and results are as follows:

S. NO	PARAMETERS	METHOD	UNITS	RESULTS	Limits As per IS 10500:2012	
					Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate source
1	pH @ 25°C	IS 3025 (Part 11)-1983 (R.2006)	-	7.8	6.5 - 8.5	No relaxation
2	Suspended Solids	2540-D- APHA 22nd Ed.2012	mg/l	24	-	-
3	Total Dissolved Solids	IS 3025 (Part 16)-1984 (R.2006)	mg/l	676	Max. 500	Max. 2000
4	Total Residual Chlorine	IS 3025 (Part 26)-1986 (R.2003)	mg/l	BDL(DL:0.1)	-	-
5	Ammonical Nitrogen as N	4500-NH_3-B,C-APHA 22nd Ed.2012	mg/l	BDL(DL:0.1)	-	-
6	Total Kjeldahl Nitrogen as N	4500-N-B,C-APHA 22 nd Ed. 2012	mg/l	BDL(DL:0.1)	-	-
7	Free Ammonia as NH_3	4500-NH_3-B,C-APHA 22nd Ed.2012	mg/l	BDL(DL:0.1)	-	-
8	Hexavalent Chromium as Cr^{6+}	3500-Cr-B-APHA 22 nd Ed. 2012	mg/l	BDL(DL:0.01)	-	-
9	Cyanide as CN	4500-CN-C,E-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	Max. 0.05	No relaxation
10	Iron as Fe	IS 3025 (Part 53)-2009	mg/l	0.19	Max. 0.3	No relaxation
11	Chloride as Cl^-	IS 3025 (Part 32)-1988 (R.2009)	mg/l	175	Max. 250	Max. 1000
12	Fluoride as F	IS 3025 (Part 60)-2008	mg/l	0.26	Max. 1.0	Max. 1.5
13	Nitrate as NO_3	IS 3025 (Part 34)-1988 (R.2003)	mg/l	2.3	Max. 45	No relaxation
14	Sulphate as SO_4	IS 3025 (Part 24)-1986 (R.2009)	mg/l	46.9	Max. 200	Max. 400
15	Phenolic Compounds as C_6H_5OH	IS 3025 (Part 43)-1992 (R.2009)	mg/l	BDL(DL:0.001)	Max. 0.001	Max. 0.002
16	Boron as B	IS 3025 (Part 57)-2005	mg/l	BDL(DL:0.1)	Max. 0.5	Max. 1.0
17	Biochemical Oxygen Demand (BOD) 3 days @ 27°C	5210-B APHA 22 nd Ed. 2012	mg/l	< 2	-	-
18	Chemical Oxygen Demand (COD)	5220-B- APHA 22 nd Ed. 2012	mg/l	< 4	-	-
19	Oil & Grease	5520-O&G-B APHA 22 nd Ed. 2012 (Partition Gravimetric Method)	mg/l	< 2	-	-
20	Dissolved Phosphate as P	4500-P-B,D-APHA 22 nd Ed. 2012	mg/l	0.13	-	-
21	Sulphide as S	4500-S^2-F-APHA 22 nd Ed. 2012 (Iodometric Method)	mg/l	BDL(DL:0.01)	Max. 0.05	No relaxation
22	Bio – Assay (Zebra Fish) Test	IS 6582 (Part 2): 2001	-	$T_f = 1$	-	-
23	Arsenic as As	3114-B-APHA 22nd Ed. 2012	mg/l	BDL(DL:0.001)	Max.0.01	Max. 0.05
24	Cadmium as Cd	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.002)	Max. 0.003	No relaxation
25	Copper as Cu	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.02)	Max. 0.05	Max. 1.5
26	Lead as Pb	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.005)	Max. 0.01	No relaxation
27	Mercury as Hg	3112-B-APHA 22nd Ed. 2012	mg/l	BDL(DL:0.001)	Max. 0.001	No relaxation
28	Nickel as Ni	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	Max. 0.02	No relaxation
29	Zinc as Zn	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.08)	Max. 5	Max. 15
30	Manganese as Mn	3111 B APHA 22 nd Edition 2012	mg/l	0.21	Max.0.1	Max. 0.3
31	Selenium as Se	IS 3025 (Part 56)-2003(R.2009)	mg/l	BDL(DL:0.005)	Max. 0.01	No relaxation
32	Vanadium as V	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	-	-

BDL - Below Detection Limit; DL - Detection limit
Note: IS 10500:2012 (Drinking Water Specification)
REMARKS: The Sample does not meet the requirement of IS 10500:2012 with respect to the parameter "Manganese".

END OF REPORT

For Chennai Testing Laboratory Pvt ltd

Authorised Signatory

TEST REPORT

Report Number and date	**CTL/CH/N-9621/2017-18 & 07.02.2018**		
Sample Number	**N-9621/17-18**		
Customer Name & Address	**M/s. Voyants Solutions Pvt. Ltd.,**		
	No. 323, Level 4, Diamond Dune, Poonamallee High Road, Aminjikarai, Chennai - 600029		
SAMPLE DETAILS			
Sample Description By Customer	**Surface Water**		
Sampling Location	Thanikachalam Drain (Sample ID: RET-SURF-001)		
GPS Reading	13° 7'52.21"N, 80°14'16.50"E		
Sampling Date	23.01.2018	**Sampled By**	Chennai Testing Laboratory Pvt. Ltd.,
Quantity Received	5 Litres	**Sampling Method**	CTL/MSP/5.7/001
Date of Receipt	23.01.2018	**Sample Condition**	Good & Received in Plastic Container
Analysis Starting Date	24.01.2018	**Analysis Completion Date**	06.02.2018

Test Results:

The above sample tested as received, and results are as follows:

S. NO	PARAMETERS	METHOD	UNITS	RESULTS	Limits As per IS 10500:2012	
					Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate source
1	pH @ 25°C	IS 3025 (Part 11)-1983 (R.2006)	-	6.9	6.5 - 8.5	No relaxation
2	Suspended Solids	2540-D- APHA 22nd Ed.2012	mg/l	236	-	-
3	Total Dissolved Solids	IS 3025 (Part 16)-1984 (R.2006)	mg/l	1496	Max. 500	Max. 2000
4	Total Residual Chlorine	IS 3025 (Part 26)-1986 (R.2003)	mg/l	BDL(DL:0.1)	-	-
5	Ammonical Nitrogen as N	4500-NH_3-B,C-APHA 22nd Ed.2012	mg/l	26.8	-	-
6	Total Kjeldahl Nitrogen as N	4500-N-B,C-APHA 22 nd Ed. 2012	mg/l	38.9	-	-
7	Free Ammonia as NH_3	4500-NH_3-B,C-APHA 22nd Ed.2012	mg/l	10.8	-	-
8	Hexavalent Chromium as Cr^{6+}	3500-Cr-B-APHA 22 nd Ed. 2012	mg/l	BDL(DL:0.01)	-	-
9	Cyanide as CN	4500-CN-C,E-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	Max. 0.05	No relaxation
10	Iron as Fe	IS 3025 (Part 53)-2009	mg/l	5.6	Max. 0.3	No relaxation
11	Chloride as Cl^-	IS 3025 (Part 32)-1988 (R.2009)	mg/l	380	Max. 250	Max. 1000
12	Fluoride as F	IS 3025 (Part 60)-2008	mg/l	0.21	Max. 1.0	Max. 1.5
13	Nitrate as NO_3	IS 3025 (Part 34)-1988 (R.2003)	mg/l	0.56	Max. 45	No relaxation
14	Sulphate as SO_4	IS 3025 (Part 24)-1986 (R.2009)	mg/l	91.4	Max. 200	Max. 400
15	Phenolic Compounds as C_6H_5OH	IS 3025 (Part 43)-1992 (R.2009)	mg/l	BDL(DL:0.001)	Max. 0.001	Max. 0.002
16	Boron as B	IS 3025 (Part 57)-2005	mg/l	BDL(DL:0.1)	Max. 0.5	Max. 1.0
17	Biochemical Oxygen Demand (BOD) 3 days @ 27°C	5210-B APHA 22 nd Ed. 2012	mg/l	80	-	-

18	Chemical Oxygen Demand (COD)	5220-B- APHA 22 nd Ed. 2012	mg/l	268	-	-
19	Oil & Grease	5520-O&G-B APHA 22 nd Ed. 2012 (Partition Gravimetric Method)	mg/l	< 2	-	-
20	Dissolved Phosphate as P	4500-P-B,D-APHA 22 nd Ed. 2012	mg/l	5.1	-	-
21	Sulphide as S	4500-S^2-F-APHA 22 nd Ed. 2012 (Iodometric Method)	mg/l	10.6	Max. 0.05	No relaxation
22	Bio – Assay (Zebra Fish) Test	IS 6582 (Part 2): 2001	-	$T_f = 2$	-	-
23	Arsenic as As	3114-B-APHA 22nd Ed. 2012	mg/l	BDL(DL:0.001)	Max.0.01	Max. 0.05
24	Cadmium as Cd	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.002)	Max. 0.003	No relaxation
25	Copper as Cu	3111-B-APHA 22nd Ed.2012	mg/l	0.05	Max. 0.05	Max. 1.5
26	Lead as Pb	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.005)	Max. 0.01	No relaxation
27	Mercury as Hg	3112-B-APHA 22nd Ed. 2012	mg/l	BDL(DL:0.001)	Max. 0.001	No relaxation
28	Nickel as Ni	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	Max. 0.02	No relaxation
29	Zinc as Zn	3111-B-APHA 22nd Ed.2012	mg/l	0.21	Max. 5	Max. 15
30	Manganese as Mn	3111 B APHA 22 nd Edition 2012	mg/l	0.29	Max.0.1	Max. 0.3
31	Selenium as Se	IS 3025 (Part 56)-2003(R.2009)	mg/l	BDL(DL:0.005)	Max. 0.01	No relaxation
32	Vanadium as V	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	-	-

BDL - Below Detection Limit; DL - Detection limit

Note: IS 10500:2012 (Drinking Water Specification)

REMARKS: The Sample does not meet the requirement of IS 10500:2012 with respect to the parameter "Manganese".

END OF REPORT

For Chennai Testing Laboratory Pvt ltd

Authorised Signatory

TEST REPORT

Report Number and date	**CTL/CH/N-9623/2017-18 & 07.02.2018**		
Sample Number	**N-9623/17-18**		
Customer Name & Address	**M/s. Voyants Solutions Pvt. Ltd.,**		
	No. 323, Level 4, Diamond Dune, Poonamallee High Road, Aminjikarai, Chennai - 600029		
SAMPLE DETAILS			
Sample Description By Customer	**Surface Water**		
Sampling Location	Puzhal Surplus - 1 (Sample ID: PUZL-SURF-001)		
GPS Reading	13°10'32.83"N, 80°12'8.64"E		
Sampling Date	23.01.2018	**Sampled By**	Chennai Testing Laboratory Pvt. Ltd.,
Quantity Received	5 Litres	**Sampling Method**	CTL/MSP/5.7/001
Date of Receipt	23.01.2018	**Sample Condition**	Good & Received in Plastic Container
Analysis Starting Date	24.01.2018	**Analysis Completion Date**	06.02.2018

Test Results

The above sample tested as received, and results are as follows:

S. NO	PARAMETERS	METHOD	UNITS	RESULTS	Limits As per IS 10500:2012	
					Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate source
1	pH @ 25°C	IS 3025 (Part 11)-1983 (R.2006)	-	6.9	6.5 - 8.5	No relaxation
2	Suspended Solids	2540-D- APHA 22nd Ed.2012	mg/l	76	-	-
3	Total Dissolved Solids	IS 3025 (Part 16)-1984 (R.2006)	mg/l	1102	Max. 500	Max. 2000
4	Total Residual Chlorine	IS 3025 (Part 26)-1986 (R.2003)	mg/l	BDL(DL:0.1)	-	-
5	Ammonical Nitrogen as N	4500-NH_3-B,C-APHA 22nd Ed.2012	mg/l	14.4	-	-
6	Total Kjeldahl Nitrogen as N	4500-N-B,C-APHA 22 nd Ed. 2012	mg/l	21.2	-	-
7	Free Ammonia as NH_3	4500-NH_3-B,C-APHA 22nd Ed.2012	mg/l	5.8	-	-
8	Hexavalent Chromium as Cr^{6+}	3500-Cr-B-APHA 22 nd Ed. 2012	mg/l	BDL(DL:0.01)	-	-
9	Cyanide as CN	4500-CN-C,E-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	Max. 0.05	No relaxation
10	Iron as Fe	IS 3025 (Part 53)-2009	mg/l	2.40	Max. 0.3	No relaxation
11	Chloride as Cl^-	IS 3025 (Part 32)-1988 (R.2009)	mg/l	250	Max. 250	Max. 1000
12	Fluoride as F	IS 3025 (Part 60)-2008	mg/l	0.23	Max. 1.0	Max. 1.5
13	Nitrate as NO_3	IS 3025 (Part 34)-1988 (R.2003)	mg/l	1.9	Max. 45	No relaxation
14	Sulphate as SO_4	IS 3025 (Part 24)-1986 (R.2009)	mg/l	103	Max. 200	Max. 400
15	Phenolic Compounds as C_6H_5OH	IS 3025 (Part 43)-1992 (R.2009)	mg/l	BDL(DL:0.001)	Max. 0.001	Max. 0.002
16	Boron as B	IS 3025 (Part 57)-2005	mg/l	BDL(DL:0.1)	Max. 0.5	Max. 1.0
17	Biochemical Oxygen Demand (BOD) 3 days @ 27°C	5210-B APHA 22 nd Ed. 2012	mg/l	40	-	-
18	Chemical Oxygen Demand (COD)	5220-B- APHA 22 nd Ed. 2012	mg/l	146	-	-
19	Oil & Grease	5520-O&G-B APHA 22 nd Ed. 2012 (Partition Gravimetric Method)	mg/l	<2	-	-
20	Dissolved Phosphate as P	4500-P-B,D-APHA 22 nd Ed. 2012	mg/l	2.0	-	-
21	Sulphide as S	4500-S^2-F-APHA 22 nd Ed. 2012 (Iodometric Method)	mg/l	1.2	Max. 0.05	No relaxation
22	Bio – Assay (Zebra Fish) Test	IS 6582 (Part 2): 2001	-	$T_f = 1$	-	-
23	Arsenic as As	3114-B-APHA 22nd Ed. 2012	mg/l	BDL(DL:0.001)	Max.0.01	Max. 0.05
24	Cadmium as Cd	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.002)	Max. 0.003	No relaxation
25	Copper as Cu	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.02)	Max. 0.05	Max. 1.5
26	Lead as Pb	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.005)	Max. 0.01	No relaxation
27	Mercury as Hg	3112-B-APHA 22nd Ed. 2012	mg/l	BDL(DL:0.001)	Max. 0.001	No relaxation
28	Nickel as Ni	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	Max. 0.02	No relaxation
29	Zinc as Zn	3111-B-APHA 22nd Ed.2012	mg/l	0.12	Max. 5	Max. 15
30	Manganese as Mn	3111 B APHA 22 nd Edition 2012	mg/l	0.29	Max.0.1	Max. 0.3
31	Selenium as Se	IS 3025 (Part 56)-2003(R.2009)	mg/l	BDL(DL:0.005)	Max. 0.01	No relaxation
32	Vanadium as V	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	-	-

BDL - Below Detection Limit; DL - Detection limit
Note: IS 10500:2012 (Drinking Water Specification)
REMARKS: The Sample does not meet the requirement of IS 10500:2012 with respect to the parameter "Manganese".

END OF REPORT

For Chennai Testing Laboratory Pvt ltd

Authorised Signatory

TEST REPORT

Report Number and date	**CTL/CH/N-9626/2017-18 & 07.02.2018**		
Sample Number	**N-9626/17-18**		
Customer Name & Address	**M/s. Voyants Solutions Pvt. Ltd.,**		
	No. 323, Level 4, Diamond Dune, Poonamallee High Road, Aminjikarai, Chennai - 600029		
SAMPLE DETAILS			
Sample Description By Customer	**Surface Water**		
Sampling Location	Puzhal Surplus - 2 (Sample ID: PUZL-SURF-002)		
GPS Reading	13°10'50.51"N, 80°15'15.39"E		
Sampling Date	23.01.2018	**Sampled By**	Chennai Testing Laboratory Pvt. Ltd.,
Quantity Received	5 Litres	**Sampling Method**	CTL/MSP/5.7/001
Date of Receipt	23.01.2018	**Sample Condition**	Good & Received in Plastic Container
Analysis Starting Date	24.01.2018	**Analysis Completion Date**	06.02.2018

Test Results

The above sample tested as received, and results are as follows:

S. NO	PARAMETERS	METHOD	UNITS	RESULTS	Limits As per IS 10500:2012	
					Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate source
1	pH @ 25°C	IS 3025 (Part 11)-1983 (R.2006)	-	7.3	6.5 - 8.5	No relaxation
2	Suspended Solids	2540-D- APHA 22nd Ed.2012	mg/l	50	-	-
3	Total Dissolved Solids	IS 3025 (Part 16)-1984 (R.2006)	mg/l	1352	Max. 500	Max. 2000
4	Total Residual Chlorine	IS 3025 (Part 26)-1986 (R.2003)	mg/l	BDL(DL:0.1)	-	-
5	Ammonical Nitrogen as N	4500-NH_3-B,C-APHA 22nd Ed.2012	mg/l	1.1	-	-
6	Total Kjeldahl Nitrogen as N	4500-N-B,C-APHA 22 nd Ed. 2012	mg/l	1.6	-	-
7	Free Ammonia as NH_3	4500-NH_3-B,C-APHA 22nd Ed.2012	mg/l	0.38	-	-
8	Hexavalent Chromium as Cr^{6+}	3500-Cr-B-APHA 22 nd Ed. 2012	mg/l	BDL(DL:0.01)	-	-
9	Cyanide as CN	4500-CN-C,E-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	Max. 0.05	No relaxation
10	Iron as Fe	IS 3025 (Part 53)-2009	mg/l	1.6	Max. 0.3	No relaxation
11	Chloride as Cl^-	IS 3025 (Part 32)-1988 (R.2009)	mg/l	425	Max. 250	Max. 1000
12	Fluoride as F	IS 3025 (Part 60)-2008	mg/l	0.26	Max. 1.0	Max. 1.5
13	Nitrate as NO_3	IS 3025 (Part 34)-1988 (R.2003)	mg/l	24.1	Max. 45	No relaxation
14	Sulphate as SO_4	IS 3025 (Part 24)-1986 (R.2009)	mg/l	63.3	Max. 200	Max. 400
15	Phenolic Compounds as C_6H_5OH	IS 3025 (Part 43)-1992 (R.2009)	mg/l	BDL(DL:0.001)	Max. 0.001	Max. 0.002
16	Boron as B	IS 3025 (Part 57)-2005	mg/l	BDL(DL:0.1)	Max. 0.5	Max. 1.0
17	Biochemical Oxygen Demand (BOD) 3 days @ 27°C	5210-B APHA 22 nd Ed. 2012	mg/l	6	-	-

18	Chemical Oxygen Demand (COD)	5220-B- APHA 22 nd Ed. 2012	mg/l	24	-	-
19	Oil & Grease	5520-O&G-B APHA 22 nd Ed. 2012 (Partition Gravimetric Method)	mg/l	< 2	-	-
20	Dissolved Phosphate as P	4500-P-B,D-APHA 22 nd Ed. 2012	mg/l	0.64	-	-
21	Sulphide as S	4500-S^2-F-APHA 22 nd Ed. 2012 (Iodometric Method)	mg/l	BDL(DL:0.01)	Max. 0.05	No relaxation
22	Bio – Assay (Zebra Fish) Test	IS 6582 (Part 2): 2001	-	$T_f = 1$	-	-
23	Arsenic as As	3114-B-APHA 22nd Ed. 2012	mg/l	BDL(DL:0.001)	Max.0.01	Max. 0.05
24	Cadmium as Cd	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.002)	Max. 0.003	No relaxation
25	Copper as Cu	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.02)	Max. 0.05	Max. 1.5
26	Lead as Pb	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.005)	Max. 0.01	No relaxation
27	Mercury as Hg	3112-B-APHA 22nd Ed. 2012	mg/l	BDL(DL:0.001)	Max. 0.001	No relaxation
28	Nickel as Ni	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	Max. 0.02	No relaxation
29	Zinc as Zn	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.08)	Max. 5	Max. 15
30	Manganese as Mn	3111 B APHA 22 nd Edition 2012	mg/l	0.19	Max.0.1	Max. 0.3
31	Selenium as Se	IS 3025 (Part 56)-2003(R.2009)	mg/l	BDL(DL:0.005)	Max. 0.01	No relaxation
32	Vanadium as V	3111-B-APHA 22nd Ed.2012	mg/l	BDL(DL:0.01)	-	-

BDL - Below Detection Limit; DL - Detection limit

Note: IS 10500:2012 (Drinking Water Specification)

REMARKS: The Sample does not meet the requirement of IS 10500:2012 with respect to the parameter "Manganese".

END OF REPORT

For Chennai Testing Laboratory Pvt ltd

Authorised Signatory

List of Parks for Tree Plantation

GREATER CHENNAI CORPORATION / PARKS DEPARTMENT				
MAINTENANCE OF PARKS DETAILS				
Sl. No.	Zone	Division	Name / Location of the Park	Area in M²
1	1	5	Hansa Garden Park / Ajax TVT	1411.5
2	1	5	Alcargo Near Park	1012
3	1	5	Sakthipuram Park	3040
4	1	11	Shanmuganar Park	2074
5	2	15	Block no 26 CPS- 10	1000
6	2	15	Block no 29 CPS- 9	1699.47
7	2	15	Block no 63 CPS- 7	768.32
8	2	15	Manali puthu nagar CPS- 8 (Sadayankuppam) park	830
9	2	16	Block no 90 CPS - 3	778.12
10	2	16	Block no 134&135 CPS - 1	985.54
11	2	16	Block no 78 CPS - 5	301.5
12	2	16	Manali puthu nagar CPS- 4 (Sadayankuppam)+D362 park	1088
13	2	17	Vadaperumpakkam park	300
14	2	17	Thirupathy Devasthanam nagar park	1534
15	2	18	Vimalapuram II street park	501.76
16	2	18	CPCL IV street park	225
17	2	18	Nedunchezhiyan street park	2482.04
18	2	19	Lake view apartment park (Kamarajar Salai)	832
19	2	19	MMDA 34th street park	243.36
20	2	20	Lake view park (Chinna mathur salai)	1925
21	2	21	Jalagandamariamman koil street park	835
22	2	19	MMDA II Main road park	16362
23	3	22	Macro Marvel 1st cross st	1008
24	3	22	Macro Marvel 2nd cross st	504
25	3	22	Gurushanthi Nagar Park	958.91
26	3	23	Ambattur Red Hills Parks	3000
27	3	24	DG Nagar	1288
28	3	25	Srinivasa nagar main road	3317
29	3	25	Collector nagar	1638
30	3	25	Pathmavathy Nagar Park	973
31	3	26	Secretariate Colony Park	1210
32	3	28	Padmagiri Nagar Park	4340
33	3	28	Krishna Nagar park and childrens playfield	500
34	3	30	Ring Road Park	1780
35	3	30	VRD Nagar Park	3375
36	3	30	Sivasakthi Nagar 2nd Main Road	830
37	3	30	RC Flats Arul nagar park	1000
38	3	31	KKR Nagar 1st Main road Park	4035
39	3	31	KKR Nagar 2nd Main road Park	4315
40	3	31	RC Flats osr park, Near sidco, MTH road	350
41	3	32	Teachers Colony 4th Cross St Park	3450

42	3	32	Teachers Colony 6th Main Rd Park	732
43	3	33	Thanikachalam Nagar B Block Park	1221
44	3	33	Selvam Nagar Park	743
45	3	33	VGP Nagar Park	1000
46	7	79	Ram Nagar park	220
47	7	79	Lenin Nagar Park	418
48	7	79	Gandhi main Road Park	611
49	7	79	Childrens Park, Park street	1040
50	7	80	Thangal Eri Park	17000
51	7	80	Bharathi Nagar Park	550
52	7	81	Thiruvenkadam Nagar Park	3300
53	7	81	Krishnapuram Park	3000
54	7	81	secretriate colony Park	4000
55	7	82	Hindustan Colony Park	2000
56	7	83	Sri Ranga Nagar Park	786.24
57	7	83	Sastha Nagar Park	580.5
58	7	83	Subulakshmi Nagar park	1407.4
59	7	83	TNHB 61st st	2400
60	7	83	Thamaraikulam Park	4398
61	7	84	K.R Nagar Park	1751
62	7	84	TNHB 4th st park	1923.75
63	7	86	Gopal swamy nagar park	440
64	7	86	Sindhu Nathi Park	1300
65	7	86	Children Park at the junction of Bharathi Street(Kalidasan Street)	700
66	7	86	VGN Cosmo Polis Park	2989
67	7	86	Chelliamman Koil Pond Park (Including Pond)	8800
68	7	86	Thamirabharani Park - 1	1269
69	7	86	Thamirabharani Park - 2	855

GPS Co-ordinates of Affected Trees

TREE ID.	LATITUDE (NORTH)	LONGITUDE (EAST)
T1	13.22446	80.27869
T2	13.21284	80.27909
T3	13.2128	80.27943
T4	13.20866	80.27334
T5	13.20866	80.27334
T6	13.21069	80.2737
T7	13.21161	80.27213
T8	13.21155	80.27237
T9	13.21148	80.27255
T10	13.21135	80.27318
T11	13.21134	80.27328
T12	13.21119	80.27238
T13	13.21138	80.27215
T14	13.2093	80.27173
T15	13.20907	80.27173
T16	13.20889	80.27166
T17	13.20883	80.27295
T18	13.20889	80.27297
T19	13.20921	80.27302
T20	13.21017	80.27339
T21	13.20826	80.27704
T22	13.20843	80.27449
T23	13.2088	80.27458
T26	13.20772	80.2773
T27	13.20613	80.27754
T28	13.20453	80.27714

TREE ID.	LATITUDE (NORTH)	LONGITUDE (EAST)
T29	13.20414	80.27946
T30	13.20594	80.27527
T31	13.20593	80.27522
T32	13.20592	80.27522
T33	13.2066	80.27402
T34	13.20637	80.27396
T35	13.20633	80.27395
T36	13.20624	80.27393
T37	13.20605	80.27388
T38	13.20267	80.2761
T39	13.20261	80.27609
T40	13.20249	80.27607
T41	13.20141	80.27594
T42	13.20137	80.27595
T43	13.20056	80.27582
T44	13.20866	80.19966
T45	13.20866	80.19966
T46	13.20124	80.27919
T47	13.2012	80.27942
T48	13.2012	80.27942
T49	13.2012	80.27942
T50	13.2012	80.27942
T51	13.20256	80.27876
T52	13.20258	80.27843
T53	13.20359	80.27891
T54	13.19793	80.27492
T55	13.19794	80.27485

TREE ID.	LATITUDE (NORTH)	LONGITUDE (EAST)
T56	13.18385	80.28319
T57	13.18328	80.28426
T58	13.19206	80.26936
T59	13.19238	80.25364
T60	13.19262	80.25167
T61	13.1871	80.23929
T62	13.18458	80.2377
T63	13.18429	80.23673
T64	13.18388	80.23592
T65	13.10722	80.15331
T66	13.11333	80.14834
T67	13.10402	80.15497
T68	13.10402	80.155
T69	13.10381	80.15624
T70	13.1016	80.15973
T71	13.11129	80.18188
T72	13.1109	80.18198
T73	13.11088	80.18197
T74	13.11133	80.18241
T75	13.11017	80.18713
T76	13.11017	80.18708
T77	13.11092	80.18638
T78	13.11746	80.16604
T79	13.12032	80.16681
T80	13.12004	80.16692
T81	13.12195	80.16737
T82	13.12356	80.16803

TREE ID.	LATITUDE (NORTH)	LONGITUDE (EAST)
T83	13.12383	80.16817
T84	13.1244	80.16827
T85	13.12462	80.16834
T86	13.12495	80.16834
T87	13.12651	80.16949
T88	13.123298	80.16839
T89	13.12254	80.16452
T90	13.12274	80.16454
T91	13.12447	80.15977
T92	13.12112	80.160187
T93	13.1211	80.16017
T94	13.121043	80.16016
T95	13.12092	80.15966
T96	13.120878	80.15945
T97	13.12089	80.1593
T98	13.12088	80.1585
T99	13.12028	80.15854
T100	13.12007	80.15878
T101	13.12008	80.16014
T102	13.12019	80.16013
T103	13.12164	80.15873
T104	13.11995	80.15789
T105	13.11958	80.15782
T106	13.1193	80.15772
T107	13.11909	80.15765
T108	13.11894	80.15756
T109	13.12039	80.15518

TREE ID.	LATITUDE (NORTH)	LONGITUDE (EAST)
T110	13.12029	80.15532
T111	13.12018	80.15542
T112	13.12109	80.15223
T113	13.12118	80.15217
T114	13.12139	80.15219
T115	13.12796	80.15376
T116	13.12829	80.15372
T117	13.13169	80.15386
T118	13.13429	80.154
T119	13.13525	80.1551
T120	13.1353	80.15517
T121	13.13566	80.15608
T122	13.13567	80.15612
T123	13.13581	80.15713
T124	13.13422	80.15836
T125	13.13152	80.16183
T126	13.13209	80.16661
T127	13.13209	80.16672
T128	13.13608	80.17056
T129	13.13606	80.17063
T130	13.13872	80.1707
T131	13.14034	80.16976
T132	13.14028	80.16972
T133	13.13784	80.16734
T134	13.13563	80.16644
T135	13.13501	80.16623
T136	13.13314	80.1658

TREE ID.	LATITUDE (NORTH)	LONGITUDE (EAST)
T137	13.13275	80.16571
T138	13.13914	80.17317
T139	13.13583	80.21031
T140	13.13696	80.21085
T141	13.1379	80.21039
T142	13.13776	80.21037
T143	13.13772	80.21036
T144	13.12925	80.21472
T145	13.12924	80.2148
T146	13.12883	80.21481
T147	13.12873	80.21477
T148	13.1287	80.21474
T149	13.12823	80.21482
T150	13.1187	80.20842
T151	13.11785	80.21122
T152	13.11791	80.21163
T153	13.11793	80.21219
T154	13.12236	80.21225
T155	13.12251	80.21226
T156	13.12316	80.21223
T157	13.12303	80.21417
T158	13.12258	80.21471
T159	13.12079	80.21478
T160	13.12054	80.2148
T161	13.1205	80.21478
T162	13.11779	80.21381
T163	13.1073	80.20078

TREE ID.	LATITUDE (NORTH)	LONGITUDE (EAST)
T164	13.10865	80.20067
T165	13.10589	80.19932
T166	13.10593	80.19935
T167	13.10596	80.19944
T168	13.10593	80.19967
T169	13.10593	80.19973
T170	13.10593	80.19986
T171	13.10512	80.19865
T172	13.10129	80.199
T173	13.10094	80.19928
T174	13.10062	80.19935
T175	13.09964	80.20094
T176	13.10139	80.20208
T177	13.13829	80.23408
T178	13.13656	80.23431
T179	13.14316	80.23391
T180	13.14431	80.23337
T181	13.14355	80.23404
T182	13.14436	80.23365
T183	13.14434	80.2337
T184	13.14468	80.23338
T185	13.14467	80.23371
T186	13.14467	80.23371
T187	13.1447	80.23378
T188	13.1449	80.23314
T189	13.14475	80.23305
T190	13.14475	80.23305

TREE ID.	LATITUDE (NORTH)	LONGITUDE (EAST)
T191	13.14541	80.2336
T192	13.14565	80.23373
T193	13.14547	80.23387
T194	13.1456	80.23378
T195	13.1455	80.23346
T196	13.145397	80.23333
T197	13.14581	80.23325
T198	13.14578	80.23318
T199	13.14631	80.23309
T200	13.14643	80.23345
T201	13.1464	80.23336
T202	13.1464	80.23336
T203	13.146413	80.2334
T204	13.14666	80.23765
T205	13.14666	80.23765
T206	13.14736	80.23783
T207	13.14736	80.23783
T208	13.1474	80.23779
T209	13.14705	80.23815
T210	13.14705	80.23815
T211	13.14705	80.23815
T212	13.14367	80.23877
T213	13.14356	80.23845
T214	13.14353	80.23845
T215	13.14451	80.23945
T216	13.1451	80.23969
T217	13.14514	80.23969

TREE ID.	LATITUDE (NORTH)	LONGITUDE (EAST)
T218	13.14531	80.2397
T219	13.14532	80.23978
T220	13.14554	80.23984
T221	13.14742	80.24483
T222	13.14748	80.24491
T223	13.1455	80.24549
T224	13.1455	80.24549
T225	13.14592	80.2453
T226	13.14622	80.24537
T227	13.14601	80.24553
T228	13.14557	80.24315
T229	13.14557	80.24315
T230	13.14557	80.24315
T231	13.14557	80.24315
T232	13.14957	80.23895
T233	13.14975	80.23577
T234	13.1497	80.23513
T235	13.15169	80.23343
T236	13.15138	80.23991
T237	13.15321	80.24144
T238	13.1591	80.23382
T239	13.15726	80.24037
T240	13.15971	80.24271
T241	13.15477	80.24312
T242	13.1548	80.24395
T243	13.15497	80.24385
T244	13.15491	80.24385

TREE ID.	LATITUDE (NORTH)	LONGITUDE (EAST)
T245	13.15491	80.24385
T246	13.15522	80.24372
T247	13.15593	80.244
T248	13.15646	80.24388
T249	13.15646	80.24388
T250	13.15668	80.24394
T251	13.15815	80.24391
T252	13.15815	80.24391
T253	13.15815	80.24391
T254	13.15845	80.24404
T255	13.15845	80.24404
T256	13.1585	80.24401
T257	13.15911	80.24382
T258	13.15911	80.24382
T259	13.15911	80.24382
T260	13.16019	80.24372
T261	13.16056	80.24369
T262	13.16056	80.24369
T263	13.16095	80.24372
T264	13.1619	80.24502
T265	13.16212	80.24501
T266	13.16212	80.24501
T267	13.16212	80.24501
T268	13.16212	80.24501
T269	13.16212	80.24501
T270	13.16212	80.24501
T271	13.16234	80.24511

TREE ID.	LATITUDE (NORTH)	LONGITUDE (EAST)
T272	13.16238	80.24506
T273	13.16361	80.245
T274	13.16401	80.2452
T275	13.16498	80.24433
T276	13.16423	80.23973
T277	13.16447	80.23886
T278	13.16461	80.23871
T279	13.15165	80.24707
T280	13.15165	80.24707
T281	13.16164	80.25271
T282	13.16164	80.25271
T283	13.16181	80.25288
T284	13.17339	80.25046
T285	13.17339	80.25046
T286	13.17339	80.25046
T287	13.17309	80.25035
T288	13.17309	80.25035
T289	13.16834	80.23326
T290	13.16876	80.23954
T291	13.16885	80.2395
T292	13.16792	80.23963
T293	13.1671	80.23953
T294	13.15864	80.22559
T295	13.15982	80.228
T296	13.15895	80.22744
T297	13.15876	80.22739
T298	13.15831	80.2274
T299	13.15799	80.22725
T300	13.15766	80.22707
T301	13.15766	80.22704
T302	13.15736	80.22691
T303	13.15302	80.22799
T304	13.14843	80.2316

CRZ clearance – Application Form

PROJECT INFORMATION DETAILS

1. PROJECT DETAILS

A. Project Name

B. Survey No./ Village/ Co-ordinates

C. District

D. State

E. Whether the proposal is for (Select relevant field)

(i) Fresh Clearance under CRZ

(ii) Amendment to an already issued CRZ clearance

(iii) Extension of validity of an already issued CRZ clearance

F. Name of the Applicant

G. Address of the Applicant

H. Contact details (Telephone nos. and e-mail address)

I. Cost of the project (Rs in crores)

2. BENEFITS OF THE PROJECT

A. Details of Project Benefits

B. Employment Likely to be Generated (Yes/No)

If Yes

(i) Total Manpower Requirement

(ii) Permanent Employment (Numbers)

(iii) Temporary Employment (Numbers)

(iv) Temporary Employment- During Construction (Numbers)

(v) Temporary Employment- During Operation (Numbers)

3. DESCRIPTION OF THE PROJECT UNDER CONSIDERATION (Select the Category of the project):

A. Resort / Buildings / civic amenities

(i) Total area/Built-up area (in sqm.)

(ii) Height of structure

(iii) FSI ratio

(iv) Name of concerned town planning authority/ Panchayat etc.

(v) Details of provision of car parking area

Coastal Roads / Roads on Stilt

(i) Area of land reclamation

(ii) Estimated quantity of muck/earth for reclamation

(iii) Traffic carrying capacity

(iv) Dimensions of road

C. Pipelines from thermal power blow down

(i) Length of pipeline

(ii) Length traversing CRZ area

(iii) Depth of excavation
(iv) Width of excavation
(v) Length of pipeline from seashore to deep sea
(vi) Depth of outfall point from surface of sea water
(vii)Temperature of effluent above ambient at disposal point

D. Marine Disposal of Treated Effluent through pipelines

(i) Location of intake/ outfall
(ii) Depth of outfall point
(iii) Length of pipeline
(iv) Length traversing CRZ area
(v) Depth of excavation
(vi) Width of excavation
(vii) Length of pipeline from shore to deep sea/creek
(viii) Depth of outfall point from surface of water
(ix) Depth of water at disposal point
(x) BOD, COD, TSS, oil and grease, heavy metals in the effluent

E. Facility for storage of goods/chemicals

(i) Name of chemical
(ii) End use of the chemical
(iii) No. of tanks for storage
(iv) Capacity of tanks

F. Offshore structures

(i) Exploration or development
(ii) Depth of sea bed
(iii) No. of rigs
(iv) No. of platform
(v) Details of group gathering stations

G. Desalination Plant

(i) Capacity of desalination
(ii) Total brine generation
(iii) Temperature of effluent above ambient at disposal point
(iv) Ambient salinity
(v) Disposal point

H. Mining of atomic minerals

(i) Capacity of mining
(ii) Type of mineral to be extracted
(iii) End use of the mineral
(iv) Government order for mining lease/exploration and approved mining plan details
(v) Extent of mining lease area

I. **Sewage Treatment Plants**

(i) Capacity

(ii) Total area of construction

(iii) Compliance of effluent parameters as laid down by cpcb/spcb/other authorised agency

(iv) Whether discharge is in sea water/creek?

If yes

- Distance of marine outfall point from shore/from the tidal river bank
- Depth of outfall point from sea water/river water surface
- Depth of seabed/riverbed at outfall point

J. **Lighthouse**

(i) Total ground area of foundation/platform

(ii) Height of the structure

K. **Wind Mills**

(i) Capacity (MW)

(ii) Height of the windmill

(iii) Diameter of the windmill

(iv) Length of blade

(v) Speed of rotation

(vi) Transmission lines (overhead or underground)

L. **Others**

(i) Please specify with salient features

(ii) Upload relevant Documents (upload PDF only)

4. **PROJECT LOCATION AS PER CRZ CLASSIFICATION** (If project site falls in different/multiple CRZ categories the same may also be elaborated)

5. **CLAUSE OF CRZ NOTIFICATION UNDER WHICH PROJECT IS A PERMISSIBLE /REGULATED ACTIVITY**

6. **MANDATORY FIELDS FOR PROJECT ASSESSMENT**

A. **CRZ map in 1:4000 scale indicating HTL, LTL demarcation and distance of the nearest project boundary** (in meters) **from HTL to be stated**

(i) Upload Map (kml file)

B. **Project layout superimposed on CRZ Map 1:4000 scale with classification of project location including other notified ESAs prepared**

(i) Upload Map (kml file)

C. **CRZ map 1:25000 scale covering 7 km radius around Project site**

(i) Upload Map (kml file)

7. **PROJECT LOCATED IN** (Select Type)

(i) Non eroding Coast

(ii) Low and Medium eroding coast

(iii) High eroding Coast

8. **DETAILS OF FOREST/ MANGROVES LAND INVOLVED (YES/NO)**

   IF YES

   (i) Detail of area diverted

   (ii) Forest clearance to be submitted (Upload document)

   (iii) No. of trees to be cut under the project

   (iv) Compensatory afforestation plan to be submitted (Upload document)

9. **DISTANCE OF PROPOSED PROJECT FROM ESA/MARINE PARK/ WILD LIFE SANCTUARY**

   (i) Within 10 kilometre radius from the project site (Yes/No)

   If YES

   - Permission from NBWL to be submitted (Upload document)

10. **NOC OR CONSENT TO ESTABLISH FROM STATE/UT POLLUTION CONTROL BOARDS OBTAINED (YES/NO)**

    If YES

    (i) Copy of NOC to be provided (Upload document)

    (ii) Conditions imposed to be stated (Upload document)

11. **Environment Impact Assessment (EIA) studies (relevant fields to be filled)**

    A. Terrestrial studies:

    (i) Summary details of EIA (Terrestrial) Studies

    (ii) Upload Recommendation made in EIAs (Upload document)

    (iii) State period of Study

    B. Marine Studies

    (i) Summary details of EIA (Marine) Studies

    (ii) Upload Recommendation made in EIAs (Upload document)

    (iii) State period of Study

12. **DISASTER MANAGEMENT PLAN / NATIONAL OIL SPILL DISASTER CONTINGENCY PLAN (if applicable)**

13. **PROJECT INVOLVING DISCHARGE OF LIQUID EFFLUENTS:**

    (i) Capacity of Sewage Treatment Plant

    (ii) Quantity of effluent generated

    (iii) Quantity of effluent treated

    (iv) Method of treatment and disposal

14. **PROJECT INVOLVING DISCHARGE OF SOLID WASTE:**

    (i) Type of solid waste

    (ii) Quantity of solid waste generated

    (iii) Method of disposal

    (iv) Mode of transport

15. **WATER REQUIREMENT in kilo litres per day (KLD)**

    (i) Quantity of water required

    (ii) Source of water

(iii) If Ground water (Upload a copy of approval from Central Ground Water Authority or other authorised body)

(iv) If other Source (Upload a copy of permission from competent authority)

(v) Mode of transport

(vi) Commitment of water supply (Upload document)

16. DETAILS OF WATER TREATMENT AND RECYCLING (If any) (Multiple Entries Allowed)

Type/ Source	Quantity of Waste Water Generated (Kilos Litre per Day)	Treatment Capacity (Kilos Litre per Day)	Treatment Method	Mode of Disposal	Quantity of Discharged Water (Kilos Litre per Day)	Quantity of Treatment Water used in Recycling/Reuse (Kilo Litre per Day)

17. DETAILS OF RAINWATER HARVESTING

(i) No. of Storage tanks

(ii) Total capacity of tanks

(iii) No. of Recharge Pits

(iv) Capacity of pits

18. ENERGY REQUIREMENT AND SOURCES

(i) Total Power Requirements (kwh)

(ii) Source

(iii) Upload Copy of Agreement (upload pdf only)

(iv) Stand by Arrangement (Details)

19. ENERGY EFFICIENCY/SAVING MEASURES

(i) Source/Mode

(ii) Details of savings

20. RECOMMENDATION OF STATE COASTAL ZONE MANAGEMENT AUTHORITY

(i) Upload Copy of CZMA recommendations (Upload pdf only)

(ii) Compliance status of the Conditions Imposed

21. WHETHER PROPOSAL ATTRACTS EIA NOTIFICATION, 2006. (Yes/No)

If YES,

(i) the category thereof

(ii) Status of proposal for EC (as applicable)

22. SOCIAL AND ENVIRONMENTAL ISSUES AND MITIGATIONS MEASURES SUGGESTED INCLUDING BUT NOT LIMITED TO R&R, WATER, AIR, HAZARDOUS WASTES, ECOLOGICAL ASPECTS, ETC. (Brief Details to be Provided)

23. DETAILS OF COURT CASES Whether there is any Court Cases pending against the project and/or land in which the project is proposed to be set up? **(Yes/No)**

If Yes, Pending or Disposed (Select relevant)

(i) Name of the Court (Supreme Court, High Court, National Green Tribunal)

(ii) Case No.

(iii) Case Details

(iv) Orders/Directions of the court, if any and its relevance with the proposed project (Upload document)

24. ADDITIONAL INFORMATION, If any

UNDERTAKING: It is certified that the information given above are true to the best of my knowledge and belief and nothing contravening the provisions of CRZ Notification, 2011 has been concealed therefore.

Name and Signature of the applicant:

Date:

Integrated Biodiversity Assessment Tool

IBAT

Integrated Biodiversity Assessment Tool

WORLD BANK GROUP BIODIVERSITY RISK SCREEN

Report generated on 03/12/2019 by Ninette Pajarillaga under the license number 954-5640 held by ADB. www.ibat-alliance.org

Project Name: IND IUFMCKBP

Location: [13.3, 80.2]

Overlaps with:

Protected Areas	3
Key Biodiversity Areas	1
IUCN Red List	39
Critical Habitat	Likely

Displaying project location and buffers: 10.0 km, 50.0 km

WORLD BANK GROUP

This report is based on IFC Performance Standard 6 (PS6) but applies to World Bank Environmental and Social Standard 6 (ESS6)

About this report

IBAT provides initial screening for critical habitat values. Performance Standard 6 (PS6) defines these values for critical habitat (PS6: para. 16) and legally protected and internationally recognized areas (PS6: para. 20). PS6 will be triggered when IFC client activities are located in modified habitats containing "significant biodiversity value," natural habitats, critical habitats, legally protected areas, or areas that are internationally recognized for biodiversity. References to PS6 and Guidance Note 6 (GN6) are provided to guide further assessment and detailed definitions where necessary. Please see https://www.ifc.org/ps6 for full details on PS6 and GN6.

The report screens for known risks within a standard 50km buffer of the coordinates used for analysis. This buffer is not intended to indicate the area of impact. The report can be used to:

- Scope risks to include within an assessment of risks and impacts
- Identify gaps within an existing assessment of risks and impacts
- Prioritize between sites in a portfolio for further assessment of risks and impacts
- Inform a preliminary determination of critical habitat
- Assess the need for engaging a biodiversity specialist
- Identify additional conservation experts or organizations to inform further assessment or planning

WARNING: IBAT aims to provide the most up-to-date and accurate information available at the time of analysis. There is however a possibility of incomplete, incorrect or out-of-date information. All findings in this report must be supported by further desktop review, consultation with experts and/or on-the-ground field assessment as described in PS6 and GN6. Please consult IBAT for any additional disclaimers or recommendations applicable to the information used to generate this report.

Legal disclaimer

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Priority Species

Habitat of significant importance to priority species will trigger critical habitat status (See PS6: para 16). IBAT provides a preliminary list of priority species that could occur within the 50km buffer. This list is drawn from the IUCN Red List of Threatened Species (IUCN RL). This list should be used to guide any further assessment, with the aim of confirming knownor likely occurrence of these species within the project area. It is also possible that further assessment may confirm occurrence of additional priority species not listed here. It is strongly encouraged that any new species information collected by the project be shared with species experts and/or IUCN wherever possible in order to improve IUCN datasets.

IUCN Red List of Threatened Species - CR & EN

The following species are potentially found within 50km of the area of interest.
For the full IUCN Red List please refer to the associated csv in the report folder.

Species name	Common name	IUCN Category	Group
Glyphis gangeticus	Ganges Shark	CR	CHONDRICHTHYES
Carcharhinus hemiodon	Pondicherry Shark	CR	CHONDRICHTHYES
Pristis zijsron	Green Sawfish	CR	CHONDRICHTHYES
Rhina ancylostoma	Bowmouth Guitarfish	CR	CHONDRICHTHYES
Rhynchobatus australiae	Bottlenose Wedgefish	CR	CHONDRICHTHYES
Rhynchobatus laevis	Smoothnose Wedgefish	CR	CHONDRICHTHYES
Glaucostegus granulatus	Sharpnose Guitarfish	CR	CHONDRICHTHYES
Glaucostegus obtusus	Widenose Guitarfish	CR	CHONDRICHTHYES
Glaucostegus thouin	Clubnose Guitarfish	CR	CHONDRICHTHYES
Pristis pristis	Largetooth Sawfish	CR	CHONDRICHTHYES
Gyps bengalensis	White-rumped Vulture	CR	AVES

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Species name	Common name	IUCN Category	Group
Sarcogyps calvus	Red-headed Vulture	CR	AVES
Gyps indicus	Indian Vulture	CR	AVES
Glaucostegus typus	Giant Guitarfish	CR	CHONDRICHTHYES
Balaenoptera musculus	Blue Whale	EN	MAMMALIA
Cuon alpinus	Dhole	EN	MAMMALIA
Manis crassicaudata	Indian Pangolin	EN	MAMMALIA
Rhincodon typus	Whale Shark	EN	CHONDRICHTHYES
Isurus oxyrinchus	Shortfin Mako	EN	CHONDRICHTHYES
Sphyrna lewini	Scalloped Hammerhead	EN	CHONDRICHTHYES
Sphyrna mokarran	Great Hammerhead	EN	CHONDRICHTHYES
Anoxypristis cuspidata	Narrow Sawfish	EN	CHONDRICHTHYES
Pristis clavata	Dwarf Sawfish	EN	CHONDRICHTHYES
Eusphyra blochii	Winghead Shark	EN	CHONDRICHTHYES
Aetobatus flagellum	Longhead Eagle Ray	EN	CHONDRICHTHYES
Aetomylaeus maculatus	Mottled Eagle Ray	EN	CHONDRICHTHYES
Aetomylaeus vespertilio	Ornate Eagle Ray	EN	CHONDRICHTHYES
Isurus paucus	Longfin Mako	EN	CHONDRICHTHYES

Species name	Common name	IUCN Category	Group
Acropora rudis		EN	ANTHOZOA
Lamiopsis temminckii	Broadfin Shark	EN	CHONDRICHTHYES
Tor khudree	Black Mahseer	EN	ACTINOPTERYGII
Lindernia minima		EN	MAGNOLIOPSIDA
Holothuria scabra	Golden Sandfish	EN	HOLOTHUROIDEA
Holothuria lessoni	Golden Sandfish	EN	HOLOTHUROIDEA
Thelenota ananas	Prickly Redfish	EN	HOLOTHUROIDEA
Sypheotides indicus	Lesser Florican	EN	AVES
Sterna acuticauda	Black-bellied Tern	EN	AVES
Neophron percnopterus	Egyptian Vulture	EN	AVES
Aquila nipalensis	Steppe Eagle	EN	AVES

Restricted Range Species

There are no restricted range species to show for this report.

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Biodiversity features which are likely to trigger Critical Habitat

Protected Areas

The following protected areas are found within 10.0 km and 50.0 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Distance	Recommendation
Guindy	50.0 km	Assess for critical habitat
Pulicat Lake	50.0 km	Assess for biodiversity risk
Pulicat Lake Bird	50.0 km	Assess for biodiversity risk

Key Biodiversity Areas

The following key biodiversity areas are found within 10.0 km and 50.0 km of the area of interest.
For further details please refer to the associated csv file in the report folder.

Area name	Distance	Recommendation
Pulicat Lake	50.0 km	Assess for critical habitat

Species with potential to occur

Area Taxonomic group	Total assessed species	Total (CR, EN & VU)	CR	EN	VU	NT	LC	DD
CHONDRICHTHYES	72	40	11	12	17	17	6	9
AVES	289	13	3	4	6	16	260	0

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Area Taxonomic group	Total assessed species	Total (CR, EN & VU)	CR	EN	VU	NT	LC	DD
MAMMALIA	70	9	0	3	6	3	53	5
ANTHOZOA	6	2	0	1	1	1	2	1
ACTINOPTERYGII	583	7	0	1	6	8	527	41
MAGNOLIOPSIDA	76	2	0	1	1	1	72	1
HOLOTHUROIDEA	32	7	0	3	4	0	14	11
REPTILIA	43	3	0	0	3	0	35	5
LILIOPSIDA	135	2	0	0	2	0	130	3
AMPHIBIA	19	0	0	0	0	0	19	0
INSECTA	45	0	0	0	0	0	44	1
HYDROZOA	2	0	0	0	0	0	2	0
MALACOSTRACA	24	0	0	0	0	0	22	2
GASTROPODA	114	0	0	0	0	0	110	4
POLYPODIOPSIDA	9	0	0	0	0	0	9	0
BIVALVIA	12	0	0	0	0	0	10	2
CHAROPHYACEAE	8	0	0	0	0	0	7	1
ARACHNIDA	1	0	0	0	0	0	1	0

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Country-level summary

Coming soon

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Recommended Experts and Organizations

For projects located in critical habitat, clients must ensure that external experts with regional expertise are involved in further assessment (GN6: GN22). Clients are encouraged to develop partnerships with recognized and credible conservation organizations and/or academic institutes, especially with respect to potential developments in natural or critical habitat (GN6: GN23). Where critical habitats are triggered by priority species, species specialists must be involved. IBAT provides data originally collected by a large network of national partners, while species information is sourced via the IUCN Red List and affiliated Species Specialist Groups. These experts and organizations are listed below. **Please note that this is not intended as a comprehensive list of organizations and experts. These organizations and experts are under no obligation to support any further assessment and do so entirely at their discretion and under their terms. Any views expressed or recommendations made by these stakeholders should not be attributed to the IFC or IBAT for IFC partners.**

Relevant national or regional organizations

IBAT integrates information developed by a global network of conservation agencies, organizations and experts. These efforts are coordinated by the IBAT Alliance (BirdLife International, Conservation International, IUCN and UNEP-WCMC) who compile and maintain this information as globally standardized databases. The local partners most relevant to the area of analysis are:

Wild Bird Society of Japan Address: Maruwa Building, 3-9-23 Nishi-Gotanda, Shinagawa-ku, Tokyo 141-0031, JapanWeb: http://www.wbsj.org/

BirdLife Asia Regional Office Address: 354 Tanglin Road, #01-16/17, Tanglin International Centre, Singapore 247672 Email: singapore.office@birdlife.org Web: http://www.birdlife.org/asia

Directory for Species Survival Commission (SSC) Specialist Groups and Red List Authorities

URL: http://www.iucn.org/about/work/programmes/species/who_we_are/ssc_specialist_groups_and_red_list_authorities_directory/

Health and Safety Plan (COVID 19)

Project Number: 49107- 009

June 2020

IND: Integrated Urban Flood Management for Chennai - Kosasthalaiyar Basin Project

Prepared by Greater Chennai Corporation (GCC) for the Asian Development Bank.

CONTENTS

1. Project Rationale

1. Kosasthalaiyar River Basin is located in the northern part of Chennai, India consisting of an area of 127.80 km^2 covering Greater Chennai Corporation (GCC) administrative zones 1, 2, 3, 7 & 8. The project area has been divided into eleven (11) watersheds based on the topography and natural flow patterns. The total length of the existing storm water drain is 280km, of which 105km length of drain is in good condition which will be retained. The remaining 175km of drain is required to be rehabilitated due to inadequate hydraulic carrying capacity. Apart from the existing drain (280 km), new drain for a length of 588 km have been proposed. Necessary interlinking of water bodies through the existing or proposed drain has also been considered to maintain the water balance and achieve maximum water storage within the Kosasthalaiyar drainage basin. In addition, the macro drains/surplus canals managed by PWD (3 canals) and GCC (4 canals) along with necessary rainwater harvesting structures are also being considered as part of this Integrated Urban Flood Management Project. GCC intends to take up the proposed Integrated Urban Flood Management for the Chennai-Kosasthalaiyar Basin for implementation, which shall be financed by the Asian Development Bank (ADB) through Multi-Tranche Financing Facility (MFF).

2. **Institutional Setup.** Municipal Administration and Water Supply Department (MAWS) of GoTN acting through the Greater Chennai Corporation (GCC) are the Executing Agency (EA). A Project Management Unit (PMU) will be established in GCC headed by a Project Director and Project Manager. GCC is the Implementing Agency (IA) for this project. A Project Implementation Unit (PIU) will be established in GCC which will be headed by a Project Manager. PIU will be assisted by Project Support Consultant (PSC).

3. To hasten the implementation of the project it has been decided to split the project into 42 packages under 3 phases. GCC has decided to invite the bid for Phase 1 in the month of June 2020. For which all the necessary project documents including the DPR's, safeguard documents, bid documents and project estimations are almost in the verge of completion.

2. Ongoing Corona Virus Disease (COVID-19) Crisis

4. **About COVID-19**. Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness. The COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes. At this time, there are no specific vaccines or treatments for COVID-19.[16] However, precautions can be implemented to prevent and slow down the transmission of the virus.

5. **Common Symptoms of Corona Virus Disease**[17]

COVID-19 affects different people in different ways. Most infected people will develop mild to moderate illness and recover without hospitalization.
Most common symptoms:

- fever.
- dry cough.

[16] World Health Organization. https://www.who.int/health-topics/coronavirus#tab=tab_1
[17] World Health Organization. https://www.who.int/health-topics/coronavirus#tab=tab_3

- tiredness.

Less common symptoms:
- aches and pains.
- sore throat.
- diarrhea.
- conjunctivitis.
- headache.
- loss of taste or smell.
- a rash on skin, or discoloration of fingers or toes.

Serious symptoms:
- difficulty breathing or shortness of breath.
- chest pain or pressure.
- loss of speech or movement.

6. The first case of the COVID-19 pandemic in the Indian state of Tamil Nadu was reported in the month of March 2020. Followed by that the Government of Tamil Nadu have taken initiatives in containing the spread of the virus, however, at present situation it is second highest number of confirmed cases in India after Maharashtra. After a serious of lockdown and enforcement of 144, the economic activity in the state has come to standstill, hence it has been decided to give relaxation in the non-containment zones to continue the business (outdoor works) provided with Standard Operating Procedures (SOP's) and Guidelines with specific actions. Similar approach shall be adopted for the containment zones as soon as the COVID infection level declines.

7. As per the WHO statement "one can reduce the chances of being infected or spreading COVID by taking simple precautionary measures". In line with WHO, various guidelines/guidance notes/ SOP's were issued by the national/state government, ILO and World Bank/IFC from time to time to avoid the spread of diseases.

3. Need for Health and Safety Plan for COVID 19

8. In view of this various guidelines/guidance notes/ SOP's published by the state and central government (Ministry of Health and Family Welfare (MoHFW), and Ministry of Housing and Urban Affairs (MoHUA)), ILO, WHO and World Bank/IFC, the GCC have initiated the preparation of Health and safety plan (H&S Plan) for the Integrated Urban Flood Management Project to prevent the spread of COVID 19 infection to the project staffs, contractors and construction workers and visitors. The H&S Plan sets out guidance on how to work safely. It gives practical considerations of how this can be applied in the workplace. Accordingly, key guidelines has been prepared

- General Guideline (applicable for all)
- Guideline for Contractors
- Guideline for Workers

3.1 General Guidance

- Identity Cards will be issued to everyone entering the construction area. Periodic tailgate sessions will be arranged to review site protocols in view of highly dynamic scenarios ensuring social distancing norms.
- Mandatory Thermal Scanning of everyone entering and exiting a construction site will be done may be done by using thermal scanners.

- Provision for hand wash & sanitizer (touch free) will be made at all entry and exit points and common areas. Everyone will be required to wash & sanitize his/her hands before entering the site. Same procedure to be followed after exiting the premise.
- Avoid large gatherings or meetings. Maintain at least 1 metre (3 feet) distance from persons, especially with those having flu-like symptoms, during interaction.
- For conducting Site Meetings
  - Only absolutely necessary meeting participants should attend
  - Attendees should be at least 1 metre apart from each other
  - Rooms should be well ventilated / windows opened to allow fresh air circulation
  - Consider holding meetings in open areas where possible

- Everyone entering the site area should mandatorily wear a face mask.
- Hand gloves should be used by the workers who are handling material coming from outside
- There will be a strict ban on Gutka, Tambaku, Paan etc. on site and spitting shall be strictly prohibited.
- Food should be consumed at designated areas only ensuring social distancing.
- Post lunch, waste should be disposed off by individuals in designated bins and the area should remain clean.
- Entire construction sites including site office, labour camp, canteens, pathways, toilets, entry / exit gates will be disinfected on a daily basis.
- Housekeeping team should be provided with necessary equipment.
- There will be a total ban on non-essential visitors at sites.
- Hospitals/clinics in the nearby area, which are authorized to treat COVID-19 patients, should be identified and list provided with contact number and should be available at site all the time.
- A doctor will be present periodically (at least once a week) at site on allotted time for any medical assistance.
- Appropriate signage at construction site spelling out safety practices in the language which is understood by all, like Tamil, Hindi (for migrant workers), to be displayed.
- For any confusion, clarification and update, everyone should approach designated authority (Project Implementation Unit and Project Support Consultants) or rely on an authentic source.

3.2 Guideline for Workers

- All workers to report some time earlier before the start of the shift. An attendance register has to be maintained for each shift. Masks are mandatory and social distancing[18] of at least 1m to be followed in the holding area. The focal point to provide information update.
- The workers need to wash their hands thoroughly (for at least 20-30 seconds) with soap or use sanitizers just before reporting screening. Adequate provision for hand washing, soaps, sanitizers needs to be made at the reporting location. Hand gloves mandatory for teams who are screening workmen, conducting medical check-up, disinfection

[18] https://www.mohfw.gov.in/pdf/SocialDistancingAdvisorybyMOHFW.pdf

- Health screening to be done for all workers in the shift - including temperature monitoring using a non-contact thermometer. Any worker reporting with temperature higher than 37.3^{o}C shall be sent to the isolation quarters and periodic observation be made.
    - In case the worker shows symptoms of the pandemic (including COVID-19), the procedures as laid down by the national and state laws need to be followed for testing, quarantine of at least 14 days or hospitalization, depending upon individual case.
    - All the co-workers in the shift, and other persons with known contact history in the construction site should be quarantined for a period of at least 14 days, followed by regular checkups/ observation/ examinations as laid down by the national and state laws.
- The workers found fit need to proceed to work with all required personal protective equipment, e.g., masks, gloves, goggles, boots, helmets, harness, etc.
- The workers be encouraged to avoid contact with co-workers as far as possible and wash their hands at regular intervals.
- Lunch/meal break be staggered into two so that workers proceed for lunch/meal at different times.
- There needs to be a provision of separate drinking bottles/cups for each worker, and these need to be cleaned thoroughly after meals.
- Proper hand washing arrangement (water/soaps/sanitizers) needs to be ensured at eating locations. Hand washing facilities are ideally to be located within 5m of toilets and at close range of eating space.
- The workers returning to the shift after lunch/meal break need to thoroughly wash their hands and follow the same procedure as that followed at the start of the shift.
- At the close of shift, the workers need to thoroughly wash their hands with soap/sanitizers etc.
- The PPE should be thoroughly washed/cleaned/sanitized (depending upon the type of PPE) after the shift ends.
- The meal timings should be phased in each shift. *There should be a difference of about 1 hour between two shifts* and the sensitive areas of the workplace should be cleaned / sanitized as far as possible.
- The time between two shifts should be used for cleaning and sanitizing machines, hand tools and areas of regular contact – grab handles, control levers, steering wheels, control panels, etc. shall be regularly cleaned, and at the end of shifts used across shifts (or continuous operations) where operators/helpers change.

3.3 Guideline for Contractors

- Site specific risk assessment needs to be undertaken and emergency preparedness plan be prepared for all sites, including camp sites and construction sites.
- Protocols for medical treatment, etc. should be prepared/followed, including for reporting, referral, treatment and discharge as per national and state laws and other guidelines.
- A health and safety officer to be deployed as the focal point at all project sites, and wherever, the same is not in place, urgent action needs to be taken by the contractor to recruit someone.
- Register for all the workers needs to be maintained, along with their health records. Prepare a profile of the workforce considering the following: i) Total number of

workers who live in the labor camps; ii) Total number of workers who commute from their houses; iii) Number of male and female workers.

- Limit the number of workers on site at any one time to minimize contact, including exploring operations for multi-shift working rotation.
- Entry/exit to the site should be documented. Transport vehicles used during construction activities to carry construction materials should be sanitized on regular basis (at least once a day).
- Hygienic living conditions need to be ensured in the camp sites with regular/daily cleaning, adequate hand washing facilities. Adequate provision for solid waste management needs to be provided.
- Provide health and safety training/orientation on COVID19, or any other pandemic, to all workers and staff. *Some initiatives could be like training family members of construction workers to stitch masks and gloves to augment PPE.*
- Ensure adequacy of necessary supplies of energy, water, food, medical supplies, cleaning equipment, PPE (both for regular use and those for medical exigencies) etc.
- Quarantine and isolation facilities should be established in the camps (WHO Guidelines). The isolation facilities should have separate and dedicated toilets with proper arrangement for cleaning and removal of faeces.
- Any medical waste produced during the care of ill workers should be disposed as per the national and state laws or relevant guidelines (e.g., WHO guidelines from time to time). PPE used for medical treatment/care purposes should be stored securely and kept separate from other waste. Current WHO recommendations are to clean utility gloves or heavy duty, reusable plastic aprons with soap and water and then decontaminate them with 0.5% sodium hypochlorite solution after each use. Single-use gloves (nitrile or latex) and gowns should be discarded after each use and not reused;
- Incentivize workers lodging in the local community to move to site accommodation.
- The community should be made aware, through posters etc., of procedures put in place at site to address issues related to COVID-19. This should include all measures being implemented to limit or prohibit contact between workers and the community.

3.3.1 Additional guidance for good practice for Contractors:

- Follow national orders/circulars/guidelines issued from time to time
- Apply the guidelines/guidance notes referred in the document
- Practice the Daily Drill and General Guidance.
- Camp sites and construction sites may require different approaches to avoid spread of COVID-19. Special care to be taken for supply chain related vehicles, personnel and material.
- Provide Contactless attendance system

3.3.2 Emergency protocol in case of detection of symptoms of COVID 19 to be observed by Project Manager of Contractor

- Immediate shift worker to isolation room. Inform the PSC/ PIU.
- Call for a doctor.
- Keep worker under observation for a few days in isolation room. In case of doubt act per advice of local doctor.

- COVID testing shall be arranged as per instruction of Doctor and if so advised by
- Doctor move worker to Hospital.
- Prevent rumors and take strict action against those who spread it.

3.3.3 Guideline for Material, Tools, Machinery, Vehicles etc.

- At all points of time, easy access to parking should be ensured
- All vehicles and machinery entering the premises should be disinfected mandatorily by spraying
- All construction material arriving at site should be left idle for 3 days before use to ensure safe usage
- Non-touch garbage bins with biodegradable garbage bags should be installed for waste collection at all common access areas
- Wipe down interiors and door handles of machines or construction vehicles, the handles of equipment and tools that are shared, shall be cleaned with a disinfectant prior to use

4. COVID Response and Management Plan (C-R&MP)

9. As described in these guidelines, the Contractors shall undertake a COVID risk assessment of project area and prepare a COVID Response and Management Plan (C-R&MP) and submit to GCC and PSC for approval.

4.1 Roles and Responsibilities

10. Responsibilities for implementing COVID Response and Management Plan

Sl.no	Designation	Responsibility
1	Contractor (health and safety officer)	• Preparation of COVID Response and Management Plan (based on the guidelines given in the H&S Plan) • Overall responsibility of ensuring compliance of procedure and precautions in C-R&MP • To submit daily compliance report to PIU/PSC
2	Project Support Consultant (EHS Officer)	• To coordinate efforts on behalf of Engineer in Charge and ensure compliance of these SOPs/ guidelines given in the C-R&MP. • To submit a daily confirmation report of compliances (submitted by the contractor) to PIU
3	Project Implementation Unit	• To exclusively look after the implementation of all the precautions and procedure at work site and labor camps • Review the confirmation report (submitted by the PSC) and suggest for improvements • Update the PMU with respect to the implementation of COVID Response and Management Plan.

11. The various guidelines / interim notes for construction sites have been prepared by several institutions and organizations, some of which are listed below:

a) The Ministry of Home Affairs and Ministry of Health and Family Welfare, Government of India issued several Orders/Circulars/Guidelines from time to time to be followed by the State governments, sectors and individuals :- (https://www.mha.gov.in/notifications/circulars-covid-19, https://www.mha.gov.in/sites/default/files/PR_ConsolidatedGuidelinesofMHA_28032020_0.pdf , https://www.mohfw.gov.in/. Further, amendments to these orders are updated from time to time on https://www.mha.gov.in/media/whats-new,
b) ILO's Guidance: Considerations for employment intensive works in response to COVID 19 (April 12, 2020): https://www.ilo.org/wcmsp5/groups/public/---edema/documents/publication/wcms_741669.pdf
c) WB's ESF/Safeguards interim note: COVID-19 considerations in construction/civil works projects (April 7, 2020)
d) WHO's guidelines: Getting your workplace ready for COVID-19 (March 03, 2020) https://www.who.int/docs/default-source/coronaviruse/getting-workplace-ready-for-covid-19.pdf; Water, sanitation, hygiene, and waste management for the COVID-19 virus (March 19, 2020) https://www.who.int/publications-detail/water-sanitation-hygiene-and-waste-management-for-covid-19; Rational use of personal protective equipment (PPE) for coronavirus disease (March 19, 2020): https://apps.who.int/iris/bitstream/handle/10665/331695/WHO-2019-nCov-IPC_PPE_use-2020.3-eng.pdf .
e) IASC Interim Guidance: Scaling-Up Covid-19 Outbreak Readiness and Response Operations in Humanitarian Situations, Including Camps and Camp-Like Settings (March 17, 2020) https://interagencystandingcommittee.org/other/interim-guidance-scaling-covid-19-outbreak-readiness-and-response-operations-camps-and-camp
f) IDB's Guidance for infrastructure projects on COVID-19 https://www.idbinvest.org/en/download/9625
g) IFC Guidance: Workers' accommodation: processes and standards (2009) http://documents.worldbank.org/curated/en/604561468170043490/pdf/602530WP0worke10Box358316B01PUBLIC1.pdf

Focus Group Discussion

Sivaprakasam Nagar, Surapattu in Ambathur municipal area in Zone 7 on Sunday the 1st November 2020

The residents of Sivaprakasam Nagar of I to III streets participated and the local residential welfare organization had organized the meeting at one of its residential complexes. Women and men from across the streets participated in the discussions. The gathering began its discussion by 11 am and it lasted for the next 65 minutes.

The residents had initially spirited arguments over the current conditions of the draining of flood water and their experiences in addressing the problem over the past 5 years. They stressed the need for an integrated approach involving water, drainage, and electricity authorities in laying an appropriate system for drainage. Their main contention was to provide a drain that least affected their structures, and their movement in the event of flood.

GAP Activities – Waste disposal

The discussion was slowly brought to focus on GAP activities with a prime poser on the residents' waste disposals. The residents primarily rely of Corporation's local agents for collection of wastes and the collection is on alternative days. However, only 50% of the local population dispose their wastes through this mode and another half of them just throw the wastes at streets on their whims. This have made the locality prone to issues of water logging and mosquito menace at times of rains. They seem to have no adequate knowledge on clogged drains and its impact on floods. They said that there were no clogged drain and water during flood drains out in a day. Nevertheless, the nearby lake used to be clogged with these wastes due to rainwater and this local water body is slowly deteriorated by these wastes. The residents suggested to provide big dustbins in more places in the locality to prevent throwing waste at streets as the time of current system of collecting wastes does not suit to most of the local population.

Rainwater harvesting

The residents conveyed during the discussion that almost all the houses have made rainwater harvesting facility at their compounds and each independent house have plants and trees besides growing trees in their streets.

Flood impact

As for the flood warning system, the group informed that there were no preventive planning or advanced information for them. They were unaware and the group felt that often there were only adhoc measures and no permanent measures seemed to be undertaken. However, they were not much affected by floods and the flood water used to drain in a day.

Roads were much damaged during flood and they were repaired after an agitation by the residents. At the nearby junction at ESSAR petrol bunk, the water stagnated like a tank and the local people held an agitation and later, it was cleared, and the road got repaired.

Non-domestic activities

There are no major or small industries in the locality. A petrol bunk is on the main road – Redhill road – located within a km. There are 1 or 2 shops for a street. There has been no park and the group demanded for a park. They said that a nearby government vacant land may be improved into a park.

The residents represented the group are primarily belong to middle and upper middle class. Some of the retired and serving government officers also reside in this locality. They expressed that they had no issues in respect of earning opportunities and livelihood.

Observations

A major observation during the discussion was that the residents have been split in their opinions in respect of their participation in any community activities. Most of the time, when

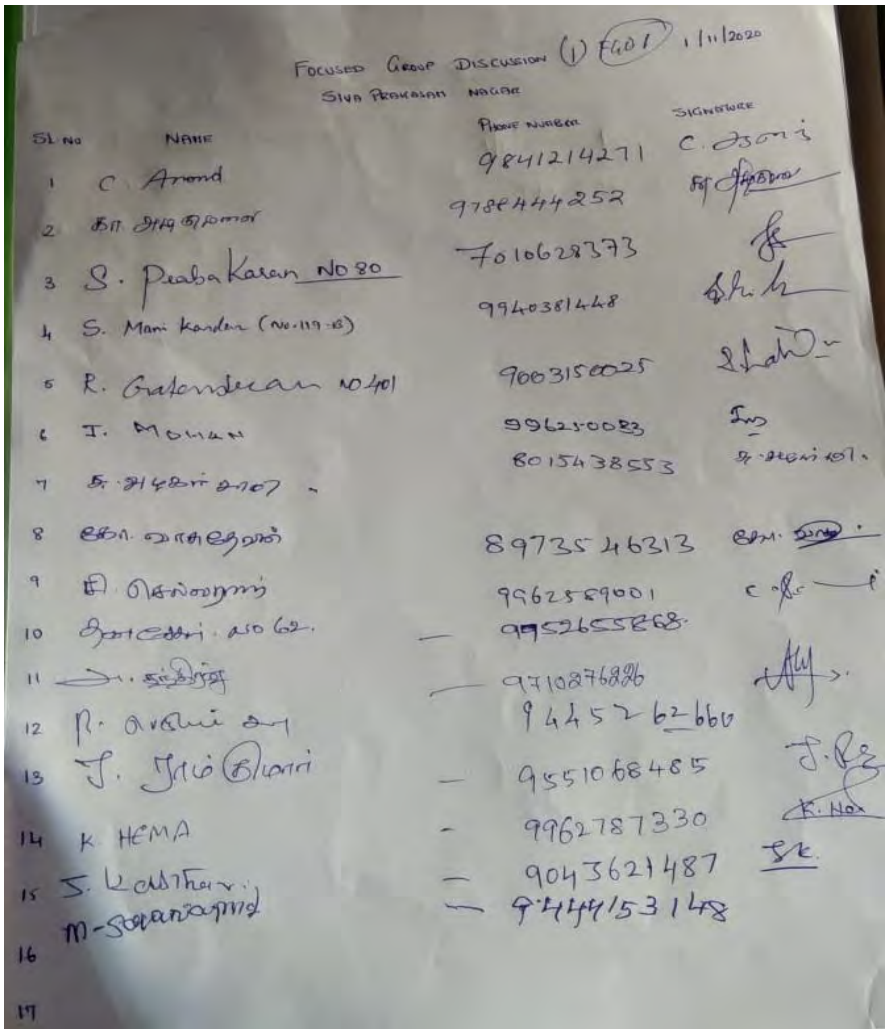
the concept of community participation is raised, there prevailed deep silence and a very few have appreciated such initiatives. The local association also experienced difficulties in bringing the people together for any public cause.

There is absence of positive attitude towards their participation in waste disposals and flood warning systems and the group agreed to initiate motivation and awareness campaign among them on these aspects.

Building confidence and cooperation

However, there were lot many questions and clarifications raised at the meeting as the Engineers from the corporation were present during the discussion. They asked about the width and depth of the drain, the formation of the drain in reference to the width and height of the road, possibility of draining stagnated water from the vacant land, the damages for the houses due to laying of the drain and ensuing compensation etc. The engineers have responded to their queries and in the process have gained their confidence and cooperation for the project. The local association has assured their cooperation and guidance in availing local support.

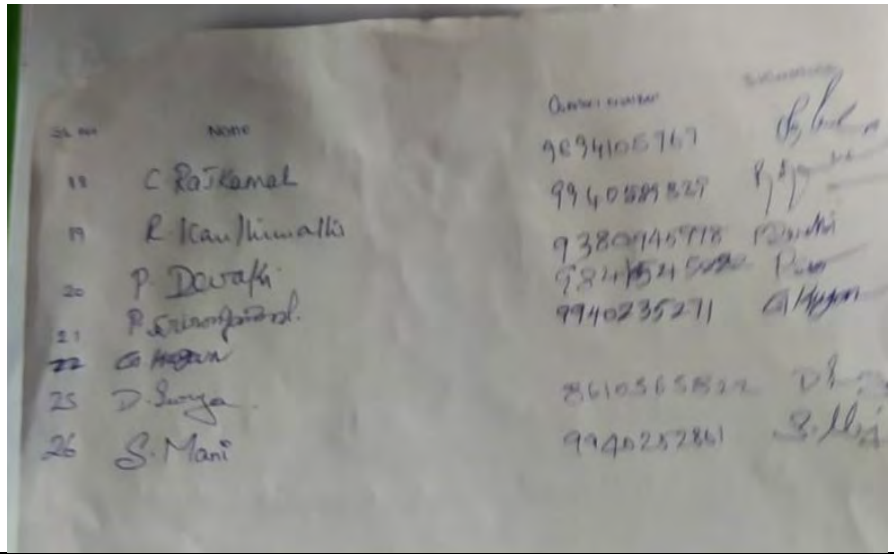
List of participants



FOCUSED GROUP DISCUSSION (1) FGD1 , 1/11/2020

SIVA PRAKASAM NAGAR

Sl No	NAME	PHONE NUMBER	SIGNATURE
1	C. Anand	9841214271	C. அனந்த்
2	[illegible]	9788444252	
3	S. Prabakaran NO 80	7010628373	
4	S. Manikandan (No.119-B)	9940381448	
5	R. Gajendiran NO 401	9003150025	
6	I. Mohan	9962500823	
7	[illegible]	8015438553	
8	[illegible]	8973546313	
9	[illegible]	9962559001	
10	[illegible]	9952655868	
11	[illegible]	9710876826	
12	P. Arasu	9445262666	
13	J. Jaya Bharathi	9551068485	
14	K HEMA	9962787330	
15	S. Kasthuri	9043621487	
16	M-Saravanapandi	9444153148	
17			



Sl No	NAME	PHONE NUMBER	SIGNATURE
18	C Rajkamal	9894105767	
19	R Kanchimalli	9940589829	
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21	P Srinivasulu	9940235271	
22	G Hasan		
25	D Sunya	8610565829	
26	S. Mani	9940252861	

Arul Nagar, Surapattu in Ambathur area in Zone 6 on Sunday the 8th November 2020

The residents of Arul Nagar of I to IV streets along with representatives from its cross streets participated and the local residential welfare organization had organized the meeting at a residence. women and men from across the streets participated in the discussions. The gathering began its discussion by 11 am and it lasted for the next 40 minutes. The residents – the owners and tenants belonging to middle class – reside there for over 10 years. Both men and women in the area go for work and have a regular income of an average of Rs 10000/m.

The session started with usual greetings and introduction of each other and the participants had quickly gone into the main discussion with a detailed description on how the flood water receded over a day.

GAP Activities - Flood in the area

Arul Nagar did not have any flood threat even in 2015 flood where Chennai experienced heavy flood. All the water drained in a day. Flood water used to stagnate only in the low-lying area – particularly the second street and water would remain there for 3 days. Around 10 houses usually get affected and people from these houses could not come out for 3 days. They also lose work and subsequently income for these three days. However, people could stay at home and they need not be evacuated. They did not respond adequately for any cleaning or other expenses due to flood.

Health issues

Participants conveyed through their discussion that there were no major health issues in their locality due to rain and floods. Usually, there are mosquitos' risk. Children and elders suffer from seasonal fever and they are bothered for 3-5 days and after treatment, they used to be well. There are also not much medical expenses. People are well aware about Corona and practice wearing mask etc.

Damages to roads and pond

Participants reflected during the discussion that during flood and rains, there were heavy damages to their roads and they were not commutable at all for a few days. As roads are at high levels compared to ground level, water gets stagnated and roads are broken. Water gets overflowed. There are many vacant plots and water gets stagnated in these plots due to high raised roads.

There are only 4 streets in the locality and all the streets get damaged and especially the2 ND street is worst affected. Persons, especially children fall frequently in these stagnated waters and get hurt. Roads are not also immediately repaired. It takes more time and even if repaired, they are mere patch works and there are no permanent solutions for the roads damaged.

The pond located in the area also used to be damaged during floods. Due to floods, the soils by the side of the pond were flooded and consequently, the pond has lost its strength and shape. The nearby lakes are not cleaned and they are full of wastes, plants and bushes.

The discussion on flood warning arrangements revealed that actually there was no such practices and people get to know about rains and floods only through TV and radio broadcast. As there is no flood so far, they did not bother about listening to flood warnings in the broadcast.

State of drains

Drains issues arise only during rainy days. Drainage connections are not provided to all houses. But all have applied for connections. In the second cross street, there is no road and no drain. As drains are not adequately cleaned, rain water overflows and stagnates for 4-5 days. After drainage works, roads works are not taken up. Similarly, after metro works, roads are not repaired. This prevents smooth water drain during rains.

Garbage disposal

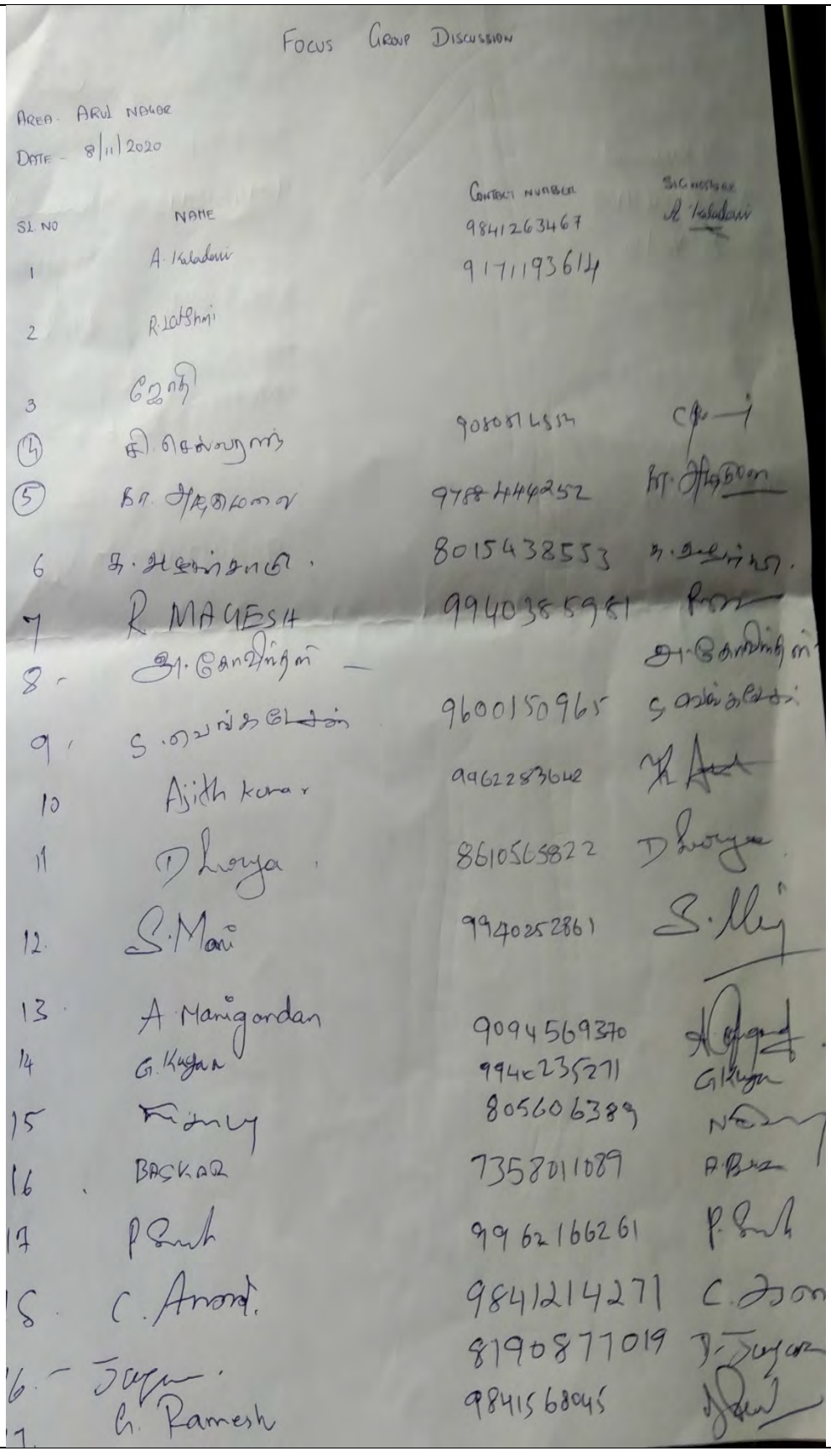
Garbage is cleaned regularly but people also throw domestic wastes outside; sometimes the sweepers did collection only for a few houses and left. Therefore, sometimes garages are burnt during the day. During rain, garbage gets washed over. Due to heaps of garbage, sometimes, rainwater is blocked around it. Earlier, as Surappattu was panchayat, the local people came forward to clear this garbage. Now, they expect the GCC to do everything.

Non-domestic activities

There are no major or small industries in the locality. There are 1 or 2 shops for a street. There has been no park or playground. One private school is in the adjoining street and there is no government school nearby.

Participants' recommendation

The participants requested the GCC officials present in the FGD to facilitate frequent cleanings of drains. They insisted that the government need to clean and widen the lake in the locality. They also have promised to help in getting details of owners of the vacant plants to dispose wastes. They also have assured their support to the officials when drain works are taken up. They also have plans to expedite planting of trees by lake bunds.



FOCUS GROUP DISCUSSION

AREA - ARUL NAGAR

DATE - 8/11/2020

SL NO	NAME	CONTACT NUMBER	SIGNATURE
1	A. Vasudevi	9841263467	A. Vasudevi
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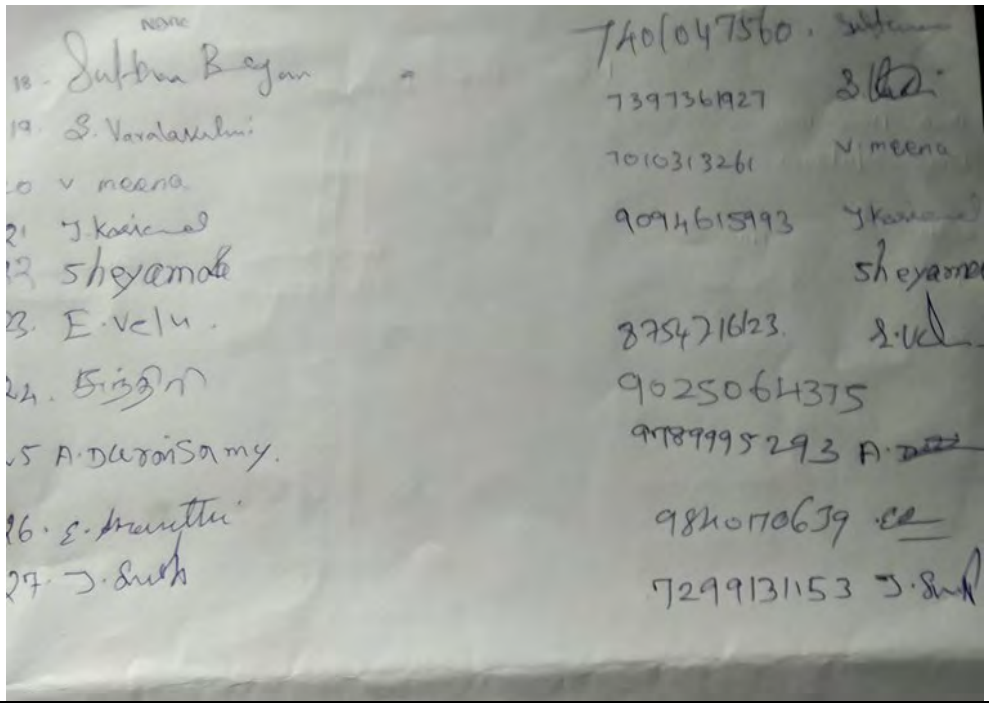
4	[illegible]	9080816514	[illegible]
5	[illegible]	9788444252	[illegible]
6	[illegible]	8015438553	[illegible]
7	R MAGESH	9940385981	[illegible]
8	[illegible]		[illegible]
9	[illegible]	9600150965	[illegible]
10	Ajith kumar	9962283642	[illegible]
11	D Lavanya	8610565822	D Lavanya
12	S. Mani	9940252861	S. Mani
13	A Manigandan	9094569370	[illegible]
14	G. Kugan	994c235271	G Kugan
15	[illegible]	8056063893	[illegible]
16	BASKAR	7358011089	[illegible]
17	[illegible]	9962166261	[illegible]
18	C. Anand	9841214271	[illegible]
16	[illegible]	8190877019	[illegible]
17	G. Ramesh	9841568045	[illegible]


Name
18 - Sulthana Begam
19. S. Varalakshmi
20 V meena
21 J. kasimal
22 Shyamala
23. E. Velu.
24. Siddhi
25 A. Duraisamy.
26. E. Manjula
27. J. Sruthi
7401047560.
7397361927
7010313261 V. meena
9094615993 J. kasimal
Shyamala
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9840770639
7299131153 J. Sruthi