CHENNAI METROPOLITAN WATER SUPPLY AND SEWERAGE BOARD

CHENNAI- 600 002

NATIONAL COMPETITIVE BIDDING

BID DOCUMENT
FOR

PROVIDING COMPREHENSIVE UNDER GROUND SEWERAGE SCHEME TO VADAPERUMBAKKAM, THEEYAMBAKKAM (D-17 / AREA - II), MATHUR (D-19 / AREA-II) & PUZHAL (D-22 & 23 / AREA - III), IN CHENNAI CITY

CONTRACT NO: CNT / SEW / ICB / AMRUT - 2.0 & KfW / 004 / 2023-24

BID DOCUMENT
VOLUME - V

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) REPORT

SUPERINTENDING ENGINEER (CONTRACTS & MONITORING)
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Note : The ESIA Report is a dynamic document which is subjected to change from time to time during the execution of the project. It is the responsibility of the Bidder to view/download the ESIA report from the official website of CMWSSB.

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LIST OF ACRONYMS

CMD	Chairperson & Managing Director
CMWSSB	Chennai Metropolitan Water Supply and Sewerage Board
DPR	Detailed Project Report
EB	Electricity Board
E&S	Environmental and Social
ECSMF	Environmental, Climate Change and Social Management Framework
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment Report
ESF	Environmental and Social Framework
ESMP	Environmental and Social Management Plan
FI	Financial Institution
GCC	Greater Chennai Corporation
GOI	Government Of India
GoTN	Government of Tamil Nadu
GRC	Grievance Redressal Committee
KfW	Kreditanstalt fur Wiederaufbau (KFW Development Bank)
MA&WS	Municipal Administration and Water Supply
MNREGA	Mahatma Gandhi National Rural Employment Guarantee Act 2005.
MoEF& CC	Ministry of Environment and Forests& Climate Change
PAP	Project Affected Person
PIA	Project implementation Agency
PIU	Project Implementation Unit
PMC	Project Management Consultant
ROW	Right of Way
SEC	Sensitive Environmental Components
SG	Sustainability Guidelines-Assessment and management of Environmental, Social and Climate Aspects: Principles and Procedures
SMIF	Sustainable Municipal Infrastructure Financing
STP	Sewerage Treatment Plant
SWM	Solid Waste Management
TNEB	Tamil Nadu Electricity Board
TNPCB	Tamil Nadu Pollution Control Board
TNUIFSL	Tamil Nadu Urban Infrastructure Financial Services Limited
ULB	Urban Local Body
WB	World Bank

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Executive Summary

1. Introduction and Background

CMWSSB is a statutory body which provides water supply and sewerage infrastructure facilities to the residents of Chennai City as well as Chennai Metropolitan Area in a phased manner. The Government of Tamil Nadu vide G.O (MS) No.256, MA &WS (Election) Dept. dt.26.12.2009 have issued orders for expanding Chennai city by annexing 42 Adjacent Urban local bodies which includes 9 Municipalities, 8 Town Panchayats and 25 Village Panchayats. The extent of the expanded Chennai City limit is extended to 426 sq.km from the original area of 174 Sq.km. As directed in the G.O. the administration of the expanded Chennai City came into effect from 20/10/2011. Therefore, it becomes the direct responsibility for the CMWSS Board to implement water Supply schemes and Underground Sewerage Schemes in the newly annexed 42 (erstwhile) local bodies as well as to other areas within Chennai Metropolitan Area.

2. Description of the project

Objective

The main objective of this sub project is toprovide Underground Sewerage Scheme toVadaperumbakkam, Theeyambakkam, Mathur&Puzhalarea (kathirvedu left our area) in line with the Master Plan prepared by CMWSSB.

Project Location

The project area is the developing residential area in Northern side of Greater Chennai Corporation. It is located in between Western side of Puzhal Lake and Eastern side of Manali, the Southern side of Madhavaram, Kathirvedu and Northern side of Vichoor and Kadapakkam. The total length of the road/streets is about 182Km.

Need of the Project

The Proposed Underground Sewerage Scheme in the project area is very much needed for the following reasons

- To achieve the goals set forth in the National Urban Sanitation Policy such as eradication of open defecation.
- Providing sanitation to all and to achieve the pre-set the service level benchmark of 100% on sewage management which includes sewage network for efficient collection of sewage, efficient treatment of the collected sewage and safe disposal of the treated effluent, reuse and recycling of treated sewage, efficient redressal of customer complaints, cost effective sewage management & efficient collection of sewage charges.
- To provide sewerage facilities on par with the erstwhile Chennai City.
- By executing the proposed underground sewerage scheme in the project area, the Govt. of Tamil Nadu & the CMWSSB achieves to provide better facilities within the project area which will create a better platform for the improved quality of living, development and growth of the project area and their surrounding areas as well.

- Providing efficient underground sewerage scheme to project area will experience rapid commercial and Industrial growth and this will result in improved economy and social status of the people.

In addition to this, every citizen of the nation will achieve fundamental right of access to the basic welfare facilities.

(i) Laying of collection system for a length of 183.384Km (Puzhal, Kathirvedu – left our streets, Mathur, Vadaperumbakkam, Theeyambakkam)
(ii) Construction of 11nos of lift stations;construction of 10nos of sub pumping stations
(iii)Laying of CI pumping mains for a length of 30.570km.
(iv) Providing house service connection for 18581 nos

Table 1:Sub-project component

Project area	Collection System Length (Km)	PS/SPS (No.)	LS (No.)	Pumping Main Length (Km)	HSC (No.)	MHs (No.)	Avg. Flow (MLD)
Puzhal, , Mathur, Vadaperumbakkam, Theeyambakkam.	183.384	10	11	30.570	18581	7087	37.98

*Note: PS/SPS –Pumping Station/Sub Pumping Station, LS – Lift Station, HSC – House service connection, MH – Machine Hole.

The ultimate averageflow (2055) of 37.98 MLD sewage is collected at Main Pumping Station MT/SPS-01 located at Manali kosappur Road (WSS OHT site) and disposed into existing 110 MLD STP at Kodungaiyur.

3. Legal and regulatory framework

Environmental Climate Change and Social Management Framework (ECSMF) was developed for the project including all relevant environmental climate and social regulations and polices. The same adhered to National and State Environmental and Social Policies and regulatory frameworks as well as international ESHS requirements and standards as per KfW Sustainability Guidelines. The prevailing key National, State level laws, rules, policies, notifications pertaining to environmental climate change and social aspects have been reviewed to the proposed UGSS. ESF of World Bank and KfW Sustainability Guidelines (Feb. 2022) have been applied and this ESIA have been prepared in line with the requirement.

4. Applicability of ECSMF

The Project proposed shall be implemented safeguarding the Environmental and Social concerns of the development activity. The requirements for ensuring environmental and social safeguards have been stipulated in the TNUIFSL's Environmental Climate and Social Management Frame work exclusively for this project.And this document is prepared based on updated ECSMF.

5. Baseline Environment Climate and Social structure

The Basic information about the project area is carried out through primary and secondary environmental survey alongwith the data from the various information

resources for the attributes of the ambient environment. The social survey was carried out along the pumping main for social baseline data. The baseline data help to understand the existing environmental conditions and socio-economic characteristics of the study area. It is required to compare and assess the impacts on E&S aspects caused during the project life cycle. The project related baseline data on climate, meteorology, land usage, water, air, noise, soil, flora, fauna and social profile of local population among others were collected and the major findings of the key parameters are summarized hereunder.

Temperature

The Meteorological data shows the Average Annual minimum Temperature is 26° Celsius and the Average Annual maximum Temperature is 34°Celsius.

Humidity

The average annual percentage of humidity (Puzhal, Mathur, Vadaperumbakkam, Theeyambakkam) is 69%. Higher rates of relative humidity are observed between November with 84% and lower rates of relative humidity are observed between June with 75%.

Air Quality

The ambient air quality monitoring was carried on 21-01-2023 for Puzhal, Mathur and Vadaperumbakkam –& for Theeyambakkam on 23-01-2023at12 locations at the project area on basis of wind direction and other metrological parameters. Samples are collected for 24 hours basis once a weekend gaseous pollutants such as Sulphur dioxide (SO_2) and Nitrogen dioxide (NO_2). The average concentrations of PM10 are 52.70µg/m^3. The average concentrations of PM 2.5 are 16.95µg/m^3.The average SO_2 concentrations were recorded as 9.41µg/m^3. The average NO_2 (oxides of nitrogen) concentrations were recorded as 6.26µg/m^3.The observed air pollutants were within the limits as per TNPCB standards.

Noise Environment

The ambient noise quality monitoring was carried on (Puzhal, Mathur and Vadaperumbakkam – 21-01-2023, Theeyambakkam – 23-01-2023) at12 locations in the project area. The Noise levels observed in the project area during day time were found to be 54.26 (A) and in the night time the noise levels observed 50.26dB (A).

Ground Water

Ground water depth varies from depth of 1.5mts around the Puzhal area, Mathur area assessment of Ground water depth varies from depth of 2mts. The Vadaperumbakkam and Theeyambakkam area Ground water depth varies from 1.5mts based on assessment of Groundwater Quality Index. As per primary data, the status of ground water quality as per the water quality index is found to be moderatein the project area. The presence of high TDS and hard water occurs in most of the locationsand it is not suitable for drinking purposes. The water treatment technologies like reverse osmosis, distillation, activated carbon etc. can eliminate the prevailing contamination, the present scenario needs consideration on rainwater harvesting, waste water reuse and water treatment techniques.

Soil Environment

Soils in the district of Mathur, Vadaperumbakkam and Theeyambakkam have been classified in shell and sandstome type of soil presented.Soils in the district of Puzhal have been classified into sandy loom soil and bentonite clay till 25m.At puzhal lake area, mostly the clay soil was present.*Source: CMRL soil test 2019/07.*

Ecological Environment

Puzhal Aeri/Red Hills Lake is 26 km away from Chennai Central railway station and Koyambedu bus stop, and about 40 km from Chennai airport. Madhavaram Botanical gardern between Mathur. Thiruvottiyur Beach is located at 10Kms away on the Eastern side of project area.

Site Specific Environmental features

All the SPS/LS sites except PZ/SPS-02 (Puzhal)are free from encumbrancesand owned Government agencies/departments. The SPS site is located in habituated area, surrounded by residential buildings hence improvement to aesthetics of site, odour control mechanism, noise control are proposed along with planting trees, constructing raised compound wall, planting creepers.The pumping main will be laid within the right of way of the roads belongs to Greater Chennai Corporation/ Tamilnadu Road Development Corporation& National Highways.Collection gravity system is the pipeline network that receives the sewage from the house service connections and conveys to the pumping station. Machine holes will be constructed at the centre of the road and pipelines will be laid connecting the Machine Holes.For the roads wider than 60ft rider mains have been proposed to avoid frequent crossings.

Social Profile

As of 2011 India censusPuzhal had a population of 31670. Males constitute 16810(53%) of the population and females 14860 (47%). Puzhal has an average literacy rate of 88.9%, higher than the national average of 59.5%; male literacy is 91.24%, and female literacy is 86.24%. In Puzhal, 11% of the population is under 6 years of age. Puzhal is now in Chennai District. Further, Main water supply to Chennai city is from Puzhal Lake.

Mathur had a population of 27,674 with 14,081 males and 13,593 females. A total of 2,980 were under the age of six, constituting 1,607 males and 1,373 females. Scheduled Castes and Scheduled Tribes accounted for 16.57% and .13% of the population, respectively. The average literacy of the town was 80.41%, compared to the national average of 72.99%.The town had a total of 6886 households.

Vadaperumbakkam is a medium size village located in Mathavaram Taluk of GCC, Tamil Nadu with total 433 families residing. The Vadaperumbakkam village has population of 1682 of which 859 are males while 823 are females as per Population Census 2011. Average Sex Ratio of Vadaperumbakkam village is 958 which is lower than Tamil Nadu state average of 996. In 2011, literacy rate of Vadaperumbakkam village was 87.32 % compared to 80.09 % of Tamil Nadu. In Vadaperumbakkam Male literacy stands at 95.26 % while female literacy rate was 79.25 %.

Theeyambakkam area as per the Census Data 2011 there are 1179 Femals per 1000 males out of 780 total population of village. There are 1022 girls per 1000 boys under 6 years of age in the

village. Out of total poplation total 541 people in Kosapur Village are literate, among them 277 are male and 264 are female in the village. Total literacy rate of ofKosapur is 78.75%, for male literacy is 88.78% and for female literacy rate is 70.4%.
Source: Census of India 2011

6. Potential Environmental, Climate and Social Impacts and Mitigation Measures

The project involves construction of collection system, lift station and pumping station and linking to existing STP for treatment and disposal.Environmental impacts from this proposed project are not adverse and mostly generic and temporary in nature. These impacts are identified mostly during construction phase only. These impacts will be mitigated through management measures identified in the Environmental Climate and Social Management Plan.A section of the project attracts CRZ notificationrequiring CRZ clearance and worksin these areas will be commenced upon obtaining CRZ clearancecomplying with the conditions laid therein. Further there are no sensitive environmental features within the project area. The implementation of Underground Sewerage Scheme to the project area is unlikely to cause any major environmental impacts.

There isno permanent/ temporary social impactswith respect to the sites for construction of pumping stations (except PZ/SPS-02 (Puzhal) as they are free from encumbrances and owned by Government agencies / departments. Further, the sewers and pumping mains will be laid within the right of way of the roads belongs to Greater Chennai Corporation / Tamilnadu Road Development Corporation. There aresix potential temporary economic impacts during construction of collection system were identified.Further, any impacts identified during the implementation of the project will be mitigated as per the policy provisions of ECSMF / based on the requirement of the funding agency.

Mitigation measures have been developed to reduce all negative impacts to acceptable levels. These were discussed with specialists responsible for the engineering aspects, and as a result significant measures have already been included in the designs for the infrastructure. Various measures suggested for odour control including: appropriately locating sewage wells within site as far as away from the houses; developing tree cover; closed facilities; and design and operation measures to prevent odour build up; standard operating procedures for operation and maintenance; imparting necessary training; safety and personal protection equipment for workers, etc.

Potential impacts during construction are considered significant but temporary, and are common impacts of construction in urban areas, and there are well developed methods to mitigate the same. Except sewer works, all other construction activities (lifting and pumping stations) will be confined to the selected sites, and the interference with the general public and community around is minimal. In these works, the temporary negative impacts arise mainly fromexcavation and resultant impact, excess earth, using of machinery, working in night hours, construction dust and noise, hauling of construction material, waste and equipment on local roads (traffic, dust, safety etc., mining of construction material from the existing government licensed mining areas, occupation health and safety aspects.

Sewer works will be conducted along public roads in an urban area congested with people, activities and traffic. Most of the Chennai city area has high density population, very narrow roads and congested with traffic, people and activities. Therefore, sewer works will have

significant impacts arising mainly: from the disturbance of residents, businesses and traffic due to construction work; safety risk to workers, public and nearby buildings due to deep trench excavations in the road with the depth of sewerlines ranging from 1 m to 4.5 m; access impediment to houses and business, disposal of large quantities of construction waste, etc. These are all general impacts of construction in urban areas, and there are well developed methods of mitigation and management that are suggested in the ESMP.

7. Analysis of Alternatives

The alternative analysis is mainly aimed to mitigate the adverse social & environmental climate impacts in the project and make technically feasible and economic &financially viable alternative.
The expected positive and negative impacts to be relatively associated with the different factors and conditions were integrated and the overall impact for the project was calculated. Based on which the infrastructure alternative is finalized is the best alternative considering all the factors including Social and Economic factors.

8. Environmental Climate and Social Standards and risk classification

Risk Classification

Environmental

The sub-project involves construction of collection system, lift station and pumping station and linking to existing STP for treatment and disposal. Environmental impacts from this proposed project during construction phase are not adverse and mostly generic & temporary in nature. These impacts will be mitigated through management measures identified in the Environmental and Social Management Plan. For operation phase, odour control measures have been identified and included in the project. The environmental risks associated with the project are "**Moderate**" as per the updated ECSMF.

Social

All the project sites are free from encumbrances and owned by Government agencies/departments. The pumping main will be laid within the Right of Way of the roads belongs to GCC/TNRDC. There are no majorsocial impacts envisaged**.** There may be potential temporary economic impacts to hawkers, vendors, while laying of sewer lines.Based on this, the Social risk associated with this project is "**Moderate**" as per updated ECSMF.

Risk Catagorisation

In view of the above, the sub project of providing UGSS to Puzhal, Kathirvedu (left out streets), Mathur, Vadaperumbakkam, Theeyambakkamis **Categorised as B** as per the updated ECSMF. However, if temporary or permanent resettlement impacts are identified during project implementation, the implementing agency will prepare a mitigation plan as per the updated ECSMF and compensate the affected based on the impact assessment. The Environmental Climate Change and Social Screening Form are attached in Annexure -1.

9. Environmental & Social Management Plan (ESMP)

ESMP is prepared for this project to address the environmental, social and health &safety impacts caused by the project activities. The ESMP details out mitigation measures, responsibilities, monitoring methods, indicators and frequency during the project cycle. The implementation of ESMP will be closely monitored along the parameters like Air, Water, Noise, Soil, Ecology, Health, Safety, etc ensure compliance to all applicable Environmental, Social and Health & Safety standards throughout the whole project cycle. Based on the findings of monitoring process, corrective measures will be taken during the project construction and operation as appropriate.

10. Stakeholder Consultation and Disclosure

The stakeholders meeting conducted on 17-06-2023 from 11 A.M to 1 P.M. where the stack holders expressed their opinions of the project. The Environmental and Social Impact Assessment Report (ESIA) made available at public locations and disclosed to a wider audience. The consultation process will be continued during project implementation.A Stakeholder Engagement Plan (SEP) is annexed at Annexure 7.

11. Grievance Redress Mechanism

A grievance redress mechanism (GRM) is described within the ESIA Report to ensure any public grievances are addressedand annexed at Annexure 9.

12. Institutional Mechanism

CMWSSB

The Chief Engineer (CE) of CMWSSB and the Project Director supported by the concerned Superintending Engineer (SE) is overall responsible for the project management. The Executive Engineer (EE) will be designated as a Convenor who will be responsible for coordination, supervision and management of all the activities related to the project. The Executive Engineer (EE) will be assisted by the Assistant Executive Engineer (AEE) and Assistant Engineer (AE).

PMC

The Project Management Consultant (PMC) will have environmental and social experts to ensure adoption and compliance of safeguards.

Contractor

The Project Manager and EHS Officer of the Contractor under the supervision of the Convenor will be mainly responsible for the E&S safeguards management and implementation of the plan and sub-plans under the project.

13. Project Benefit

The most significant advantage of the system is maintaining sustainable development, the protection of the environment and improvement of the quality of life, with a further impact on the development of tourism and the economy in general. Considering all the above advantages,

there is no doubt that if we all cooperate, ourselves and our children will enjoy a better quality of life in the years to come and that we will secure a better environment to the forthcoming generations.

14. Implementation Monitoring

Implementation of ESMP is to be supervised by CMWSSB/PMC and be periodically reported to TNUIFSL. During implementation, ESIA is to be updated to incorporate consultation details and to reflect any changes in the project scope, sites etc. and it be submitted to TNUIFSL.

CHAPTER-1 Introduction and Background

Chennai City, capital of Tamil Nadu, has been expanded recently from 176 sq.km. to 426 sq.km by annexing the 42 adjacent local bodies which included 9 Municipalities, 8 Town Panchayats and 25 Village Panchayats as per TamilNadu Government order vide G.O (MS) No.256, MA &WS (Election) Dept. dt.26.12.2009. As directed in the G.O., the administration of the Greater Chennai Corporation came in to effect from 20.10.2011.

The administration of the Greater Chennai Corporationcomprised of 200 wards. The Population of Greater Chennai Corporationwas 6.7 million in the year 2011. CMWSSB is a statutory body which provides water supply and sewerage infrastructure facilities to the residents of Chennai City as well as Chennai Metropolitan Area in a phased manner. Accordingly, CMWSSB is already implementing water supply schemes / Under Ground Sewerage Schemes in some of the local bodies in Chennai Metropolitan Area under funds from TNUDP, JNNURM, CMCDM, etc.

As there were a number of local bodies (erstwhile) which were devoid of holistic infrastructure facilities both in water supply and sewerage system in the Greater Chennai Corporation. It became the priority for the Board to cover the implementation of water supply schemes / Under Ground Sewage Schemes in the newly annexed 42 local bodies either by improving the existing water supply and sewerage facilities or by providing new water supply and sewerage facilities. Accordingly, the project area now taken up for consideration confined to providing comprehensive underground sewerage scheme to Puzhal, Kathirvedu-left out streets, Mathur, Vadaperumbakkam, Theeyambakkam (hereafter called as Project area) of Greater Chennai Corporation.

1.1 Status of Water supply Scheme in 42 Added areas

CMWSSB has commissioned comprehensive Water Supply Schemes to 31 areas namely viz. Thiruvottriyur, Kathivakkam, Ambattur, Valasaravakkam, Nolambur, Maduravoyal, Karambakkam, Porur, Meenabakkam, Nandambakkam, Alandur, UllagaramPuzthivakkam, Injambakkam, Karapakkam, Sholinganallur, Kottivakkam, Palavakkam, Perungudi, Mugalivakkam, Pallikaranai, Mathur, Vadaperumbakkam and Theeyambakkam, Surapet, Puzhal, Puthagaram, Kathirvedu, Jalladampettai, Edayanchavadi, Sadayankuppam and Kadapakkam.

Presently Water Supply Scheme work on 9 areas are under progress viz. Manali, Chinnasekkadu, Madhavaram, Nerkundram, Ramapuram, Manapakkam, Okkium-Thoraipakkam, Madipakkam and Uthandi.

Announcement was made by the Hon'ble Minister (Municipal Administration) on floor of Legislative Assembly on 24.08.2021 while moving the demand of Municipal Administration and Water Supply Department, that water supply schemes will be taken up in the remaining 2 newly added areas (Neelankarai and Semmenchery) of Chennai City. Accordingly, work order has been issued to Semmenchery water supply scheme and tender has been invited for Neelankarai WSS.

1.2 Status ofUnderground Sewerage Scheme in 42Added Areas

CMWSSB has commissioned comprehensive Underground Sewerage Scheme to 17 areas viz. Thiruvottiyur, Kathivakkam, Valasarawakkam, Madhavaram, Kathirvedu, Surapattu, Puthagaram, Nolambur, Madhuravoyal, Porur, Meenambakkam, Alandur, Ullagaram-. Puzthuthivakkam, Karapakkam, Sholinganallur, Perungudi and Ambattur.

Presently, Underground Sewerage Scheme works are in progress in 10 areas viz. Ramapuram, Mugalivakkam, Pallikaranai, Nerkundram, Manali, Chinnasekkadu, Karambakkam, Manapakkam, Madipakkam and Nandambakkam.

Announcement was made by the Hon'ble Minister (Municipal Administration) on floor of Legislative Assembly on 24.08.2021 while moving the demand of Municipal Administration and Water Supply Department that Underground Sewerage Scheme to 17 areas ULBs viz. Mathur, Vadaperumbakkam, Theeyambakkam, Puzhal, Nanadambakkam, Kottivakkam, Palavakkam, Madipakkam, Jalladampettai, Neelankarai, OkkiyamThoraipakkam, Injambakkam, Uthandi and Semmencheri including Left out streets of Madhavaram will be taken up for the 17 newly added areas.

Accordingly, the Detailed Project Reports for the above works were prepared and posed for availing funds from the funding agencies namely TUFIDCO&TNUIFSL. After appraisal, the Government accorded administrative approval for implementation of Underground Sewerage Scheme to the project area at a cost of Rs.575.18 Cr under AMRUT 2.0 and MIDF (Metropolitan Infrastructure Development Fund) and the work has been taken up for implementation. Further, the Government accorded administrative approval for the implementation of Underground Sewerage Scheme to the project area at a cost of Rs.316.35 Cr with part funding under AMRUT 2.0. However, the Detailed Project Report for the above work is under appraisal for availing the balance funds from the external funding agencies (Kfw) for implementation of the above scheme for which this Environmental and Social Impact Assessment Report (ESIA) has been prepared. Hence, the work will be taken up for implementation after sanction of funds.

Also, for the balance 15 newly added areas, the Detailed Project Reports for providing Underground Sewerage Scheme of Chennai City, namely Kottivakkam, Palavakkam, Neelankarai, Injambakkam, Uthandi, Vadaperumbakkam, Theeyambakkam, Puzhal, Mathur, Edayanchavadi, Sadayankuppam, Kadapakkam, Semmenchery and for the left out areas of Madhavaram has been appraised for availing part funds under AMRUT 2.0 and administrative Sanction from the Government of Tamil Nadu obtained. Hence, the work will be taken up for implementation after obtaining funds from AMRUT 2.0 and from any of the external funding agencies.

For Kottivakkam, Palavakkam, Neelankarai, Uthandi, Semmenchery, Injambakkam & Jalladampettai, the Detailed Project Report has been appraised for availing funds under AMRUT 2.0 &Singara Chennai 2.0. For Left out areas of Madhavaram .Edayanchavadi, Sadayankuppam, Kadapakkam, the Detailed Project Report has been appraised for availing funds under AMRUT 2.0 & KfW. Accordingly, tender has been invited for Kottivakkam, Palavakkam, Neelankarai, Uthandi, Semmenchery, Jalladampettai, Injambakkam, Left out areas of Madhavaram .Edayanchavadi, Sadayankuppam, Kadapakkam, UGSS. Now, this Detailed Project Report comprising of providing collection system, pumping main, construction of pumping stations with allied works has been prepared for "Providing Underground Sewerage Scheme to Vadaperumbakkam-Theeyambakkam (D-17 / Area – II), Mathur (D-19 / Area – II)

&Puzhal (D-22 & 23 / Area – III) “which falls in the newly added areas of Expanded Chennai City.

1.3 UGSS to Puzhal, Mathur, Vadaperumbakkam & Theeyambakkam

DPRs for Underground Sewerage Scheme to 17 areas ULBs viz. Mathur, Vadaperumbakkam, Theeyambakkam, Puzhal, Nanadambakkam, Kottivakkam, Palavakkam, Madipakkam, Jalladampettai, Neelankarai, OkkiyamThoraipakkam, Injambakkam, Uthandi, Semmencheri, Edayanchavadi, Sadayankuppam, and Kadapakkam and Left out streets of Madhavaram are revised adopting Base year population as 2025 & Ultimate year population as 2055.

This proposal for providing Underground Sewerage Scheme Vadaperumbakkam-Theeyambakkam (D-17/Area - II), Mathur(D-19/ Area - II), Puzhal(D-22&23 / Area - III)&left out streets of kathirvedu (D-25/Area-III) which comprises of providing Sewerage Collection System, Pumping station including compound wall & allied Electrical works, Pumping Main etc. The Project area falls in the newly added areas of Expanded Chennai City.

1.3.1 Objective

The main objective of this project is to provide Underground Sewerage Scheme to Puzhal, kathirvedu (leftout streets) Mathur, Vadaperumbakkam&Theeyambakkamareain Chennai City in line with the Master Plan prepared for CMWSSB.

The Detailed Project Report comprises of Preparation of detailed designs, drawings & cost estimates for providing Underground Sewerage Scheme to the project area. On obtaining funds for implementation of the above scheme, the detailed bid documents for implementationof Underground Sewerage Scheme in the project area shall be prepared.
The Detailed Project Report also includes preparation of Environmental and Social Impact Assessments Report (ESIA). Accordingly, this report has been prepared tonarrate the Environmental and social issues emerging during the implementation of the above scheme and also the management and mitigation plans for sorting the same.

1.3.2 Brief description of study area

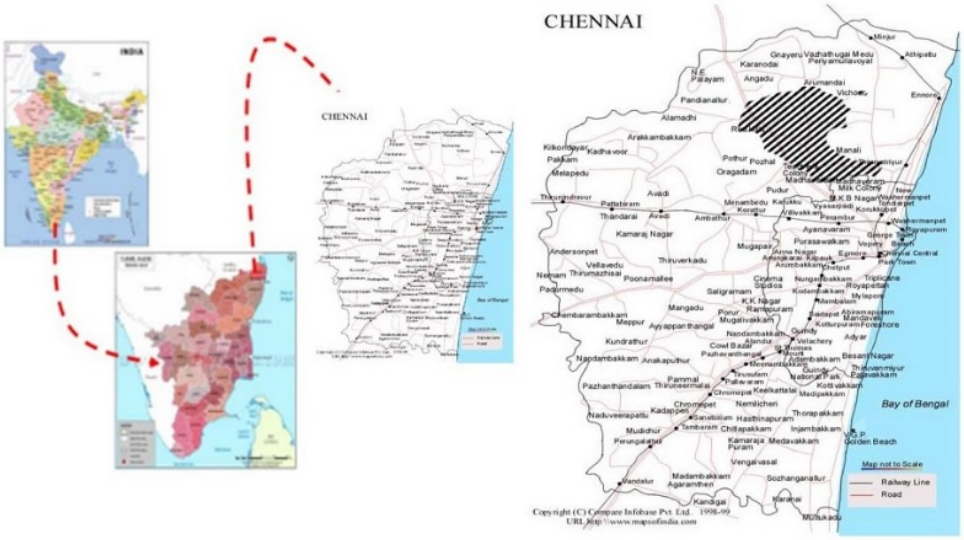


Figure 1 location representation of project area

1.3.3 Study Area – Puzhal, Mathur, Vadaperumbakkam & Theeyambakkam

Puzhal, Mathur, Vadaperumbakkam, Theeyambakkam is a Northside of residential town in Chennai district in the Indian state of Tamil Nadu.

Puzhal is a Northwestern residential town in Chennai district in the Indian state of Tamil Nadu. Puzhal is located on the banks of PuzhalLake.Puzhal, an erstwhile town Panchayat distributed among division 22 and 23 of Madhavaram Zone III of Greater Chennai city Corporation and is located in Ponneri Taluk of Thiruvallur district. Redhills Lake, one of the two major rain-fed reservoirs from where water is supplied to Chennai City is located in Puzhal. NH-5 the Grand northern trunk road connecting Chennai with Guntur is passing through the town and Central jail of Chennai is also located in Puzhal.

Mathur is one among the 42 local bodies added in the expanded area of Chennai city, erstwhile a village panchayat in Ponneri Taluk of Thiruvallur District is now assigned as Division- 19 of Manali Zone II in Chennai Corporation constituted under Madhavaram assembly and North Chennai Parliamentary constituency. Total geographical area is about 2.977 Sq. Km and total length of streets is about 53kms and number of assesses are 6886. As per the 2011 census, total population was 27674 and projected as 36769, 46515 and 56260 for the years 2025, 2040 and 2055 respectively, including MMDA housing colony built by Tamilnadu Housing Board during the year 2000.

Vadaperumbakkam (including Chettimedu) &Theeyambakkam (including Ariyalur and Kossapur) is one among the 42 local bodies in the annexed areas of expanded Chennai city of erstwhile Village panchayat in Tehsil of Madhavaram in Thiruvallur District. Now, it is assigned as Division 17 of Manali Zone II of expanded Greater Chennai Corporation. The geographical area of Vadaperumbakkam is 2.32 Sq. Km (Including Chettimedu) sharing its boundary with Theeyambakkam having the geographical area of about 4.35 Sq.Km(including Ariyalur and Kossapur). The total geographical area of 6.67 Sq. Km is located in the north west of the Chennai city at a distance of about 25kms from Central Railway Station with number of assesses as 1320.

1. Mathur

2. Theeyambakkam&Vadaperumbakkam

3. Puzhal&Kathirvedu

Figure 2: Image of project area

1.3.4 Land use

In the proposed land use map prepared by CMAfor Project area (Puzhal, Mathur, Vadaperumbakkam & Theeyambakkam) for the year 2026, (55%) has been earmarked for residential, and the rest is distributed among Institutional, Industry and Water body.

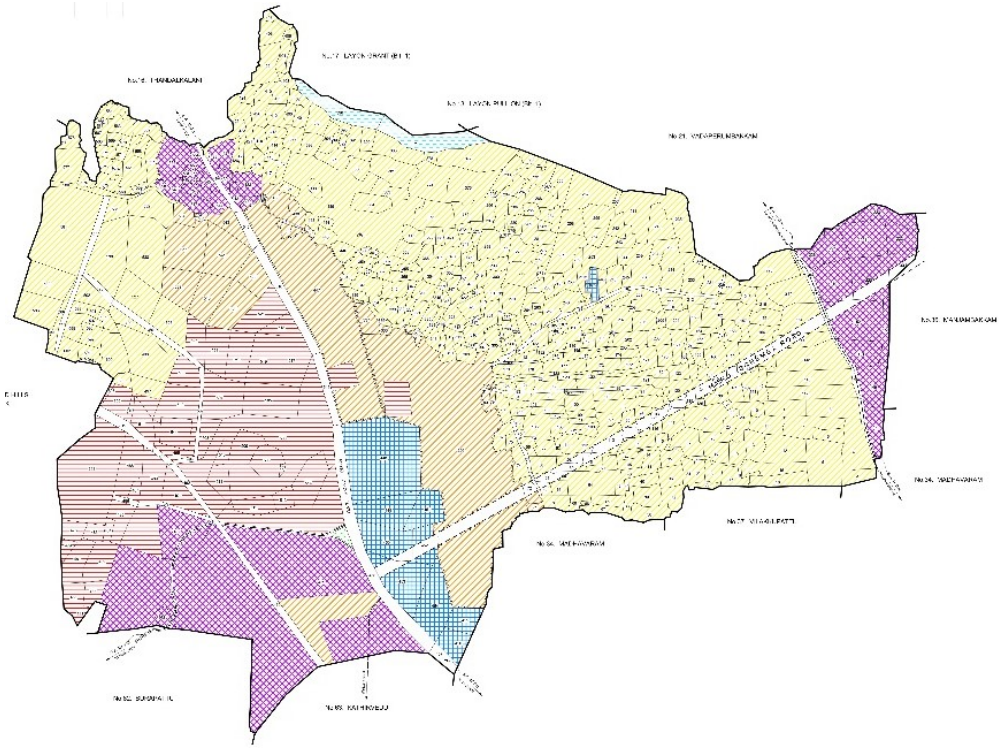


Figure 3: Land Use Map of Project Area – Puzhal

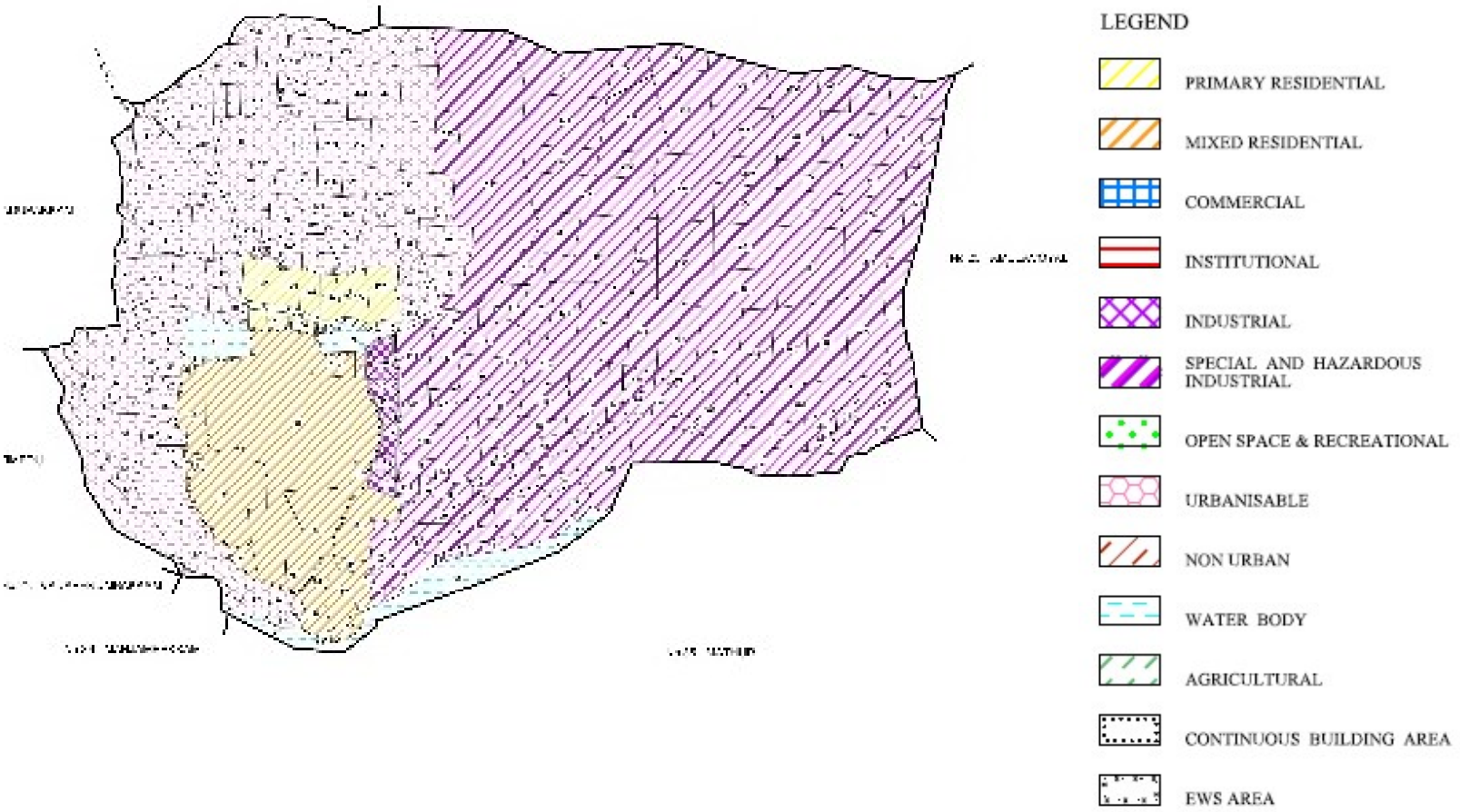


Figure 4: Land Use Map of Project Area - Kosppur

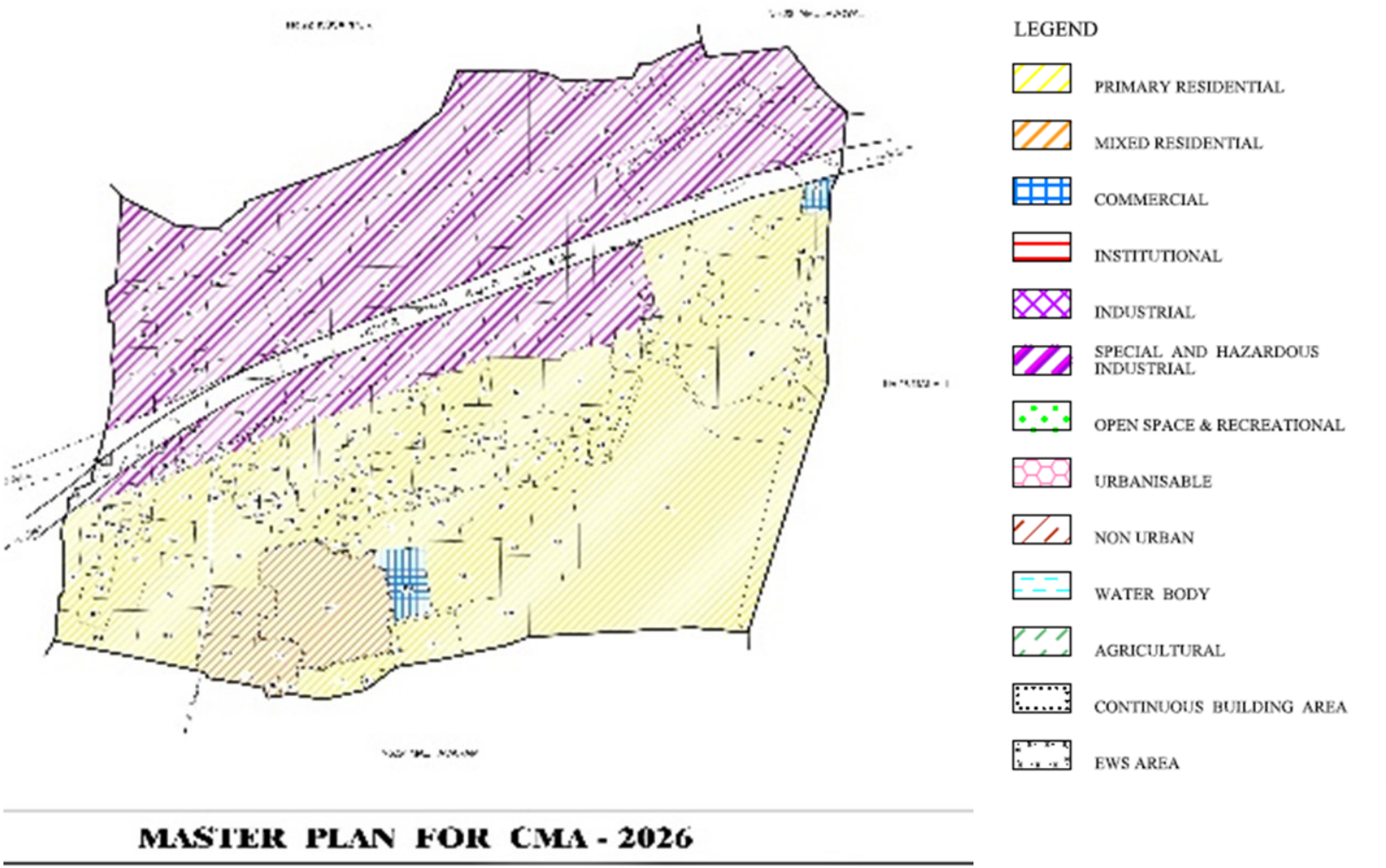


Figure 5: land use map of Project Area - Mathur

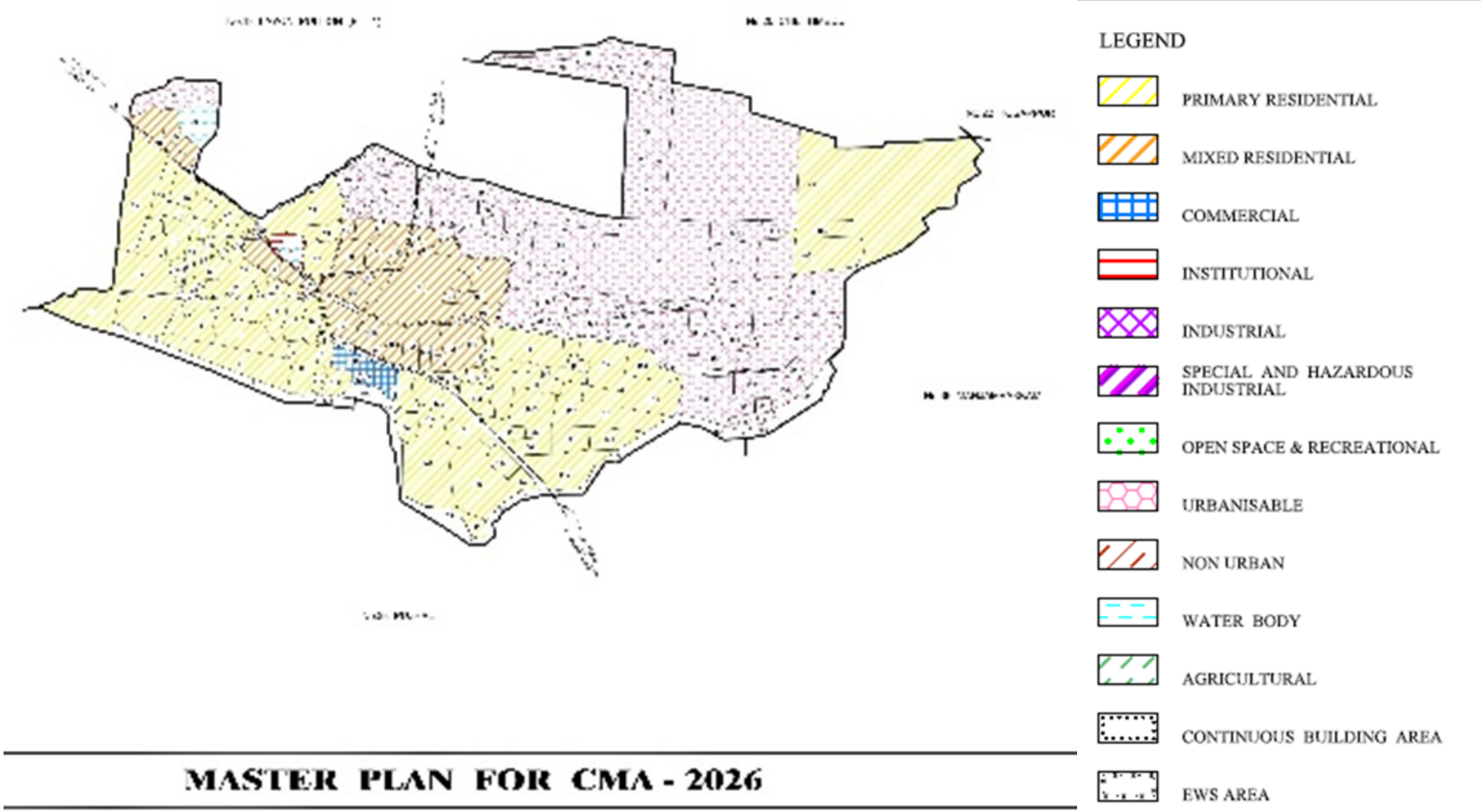


Figure 6: land use map of Project Area - Vadaperumbakkam

1.3.5 Solid waste management and Strom water drains in study area

Domestic Solid waste collected from door to door is emptied into bins placed at the road junctions. Waste collected in the bins are further emptied by mechanized carrier vehicles provided with lifting, unloading and compressing arrangement which arrives at regular intervals.

Most of the streets are provided with storm water drains. Drains are covered with RCC slabs provided with Machine hole covers at regular intervals. Due to milder slopes, the solid wastes / thrashes thrown into drains frequently clog the drains and overflows during the rainy season.

1.3.6 Existing Water Supply

A part of the Mathur area comprised of MMDA Colony layout is already provided with protected water supply system with CMWSSB source, having its headworks located at MMDA II Main Road. The source of water supply to this Headworks is from the existing 600mm dia DI transmission main originating from Madhavaram booster and laid up to Manali Booster along the Kamaraj Nagar Main Road transporting water from 300MLD Water Treatment Plant. The headworks comprises an existing UGT cum OHT cum pump house as a combined structure. The capacity of the UGT is 2.1 ML. The OHT is of capacity 1.05 ML with 15m staging height. The distribution system comprises of CI pipes ranging from 100mm to 350mm dia for a length of about 24.50km. The number of HSCs are 5053 nos.

For the rest of the areas of Mathur, the work of providing comprehensive water supply scheme has been completed for a length of 24.95 Km. The Scheme is designed to supply 150LPCD with minimum residual pressure of 12mts. Source of water is from 300MLD Water treatment plant at Red Hills.

The work of providing comprehensive water supply scheme for Vadaperumbakkam and Theeyambakkam area has been completed. The Scheme was designed to supply 150LPCD with minimum residual pressure of 12mts. Source of water is from 300MLD Water treatment plant at Red Hills.

The work of providing omprehensive water supply scheme for Puzhal is under implementation and yet to be commissioned. The Scheme is designed to supply 150LPCD withminimum residual pressure of 12mts. Source of water is from 300MLD Water treatment plant atRed Hills.

The work of providing comprehensive water supply scheme for Kathirvedu is underimplementation and yet to be commissioned. The Scheme is designed to supply 150LPCD withminimum residual pressure of 12mts. Source of water is from 300MLD Water treatment plant atRed Hills.

1.3.7 Existing Sewerage facilities

Kathirvedu area is provided with underground sewerage system for a length of about 32Km and the scheme was commissioned during the year 2018 in which, a small layout was left out. Hence, now UGSS for the left-out portions of Kathirvedu is included in the proposed project area for an estimatedstreet length of 6 Km.

1.3.8 Proposed sewerage facilities

The Proposed project involves providing Underground Sewerage Scheme to the project area comprising of laying of Collection System including House Service Connections, construction of Pumping Stations / Lift Stations to collect and pump the sewage via pumping main to a downstream pumping station and for onward disposal into the Sewage Treatment Plant for treatment. The length of streets available in the project area is 183.384Km.

1.4 Need for the project

The Proposed Underground Sewerage Scheme in the project area is very much needed for the following reasons

- The individual houses are provided with septic tanks. Most of the households are provided with water borne latrine facilities.
- These latrines are either having septic tanks or holding tanks and the sewage is collected periodically in tankers and disposed in safe disposal site.
- Also, the sullage water from some houses are directly let into open roadside drains, which find their ways to the nearest low-lying areas within these areas. This leads to stagnation, unsanitary conditions and mosquito breeding.
- The practice followed these areas is to collect the sludge from the septic tank of each household on demand in Lorries.
- For Systematic and scientific way of collection and disposal of sewage from household and thereby improve the ground water quality.

CHAPTER-2 Description of the Project

2.1 Details of the Project (Project Area)

Providing Collection System for a length of 183.384 Km including 18581 No. of House Service Connections, construction of 10 Sub Pumping Stations, 2 Lift Stations and 9 Roadside Lift Stations collect and pump the sewage to a downstream pumping station and further onward disposal into STP for treatment. Proposed project components are

Table 2: Detailed sub-project components

Sl. No	Component	Description
1.	Proposed Sewer Length Material Sewer diameter (mm)	183.384Km DWC/CI 250mm - 750mm
2.	No. of Machine holes	7087 Nos
3.	Pumping main length (proposed in Km) / Material / Size	30.57km/CI/150mm to 1000mm dia
4.	Number of Pumping Station (10 nos. of pumping stations)	1. VDP/SPS-01 - Samuel Nagar Burial Ground, Vadaperumbakkam 2. VDP/SPS-02 - Perumal Koil Street, Vadaperumbakkam. 3. CTM/SPS-01 - Chettimedu – Mariamman Koil Street. 4. KSP/SPS-01 - Kosappur Main Road. 5. PZ/SPS-01 - Kannappa Swamy Nagar 26th Street 6. PZSPS-02 - Dhanalakshmi Nagar 2nd Street 7. PZ/SPS-03 - Balaji Nagar 3rd Main Road. 8. MT/SPS-01 - Manali Kosappur Road, near Kamarajar Salai. 9. MT/SPS-02 - Bharathi Nagar 3rd street. 10. MT/SPS-03 - MMDA 3rd Main Road.
5.	Number of Lift Station (11 no. of lift stations / roadside lift stations)	1. ARY/LS-01 - Perumal Koil Street 2. ARY/LS-02 - Periyar Nagar 3. TY/LS-01 - Pillayar Koil Street, Theeyambakkam 4. VDP/LS-01 - Madhavaram Redhills Road 5. VDP/LS-02 - Annai Nagar, Vadaperumbakkam 6. KSP/LS-01 - SendrambakkamKosappur Road 7. PZ/LS-01 - Service Road of Grant Northern Trunk (GNT) Road. 8. PZ/LS-01 - Abinandha Street, Vegetarian Nagar. 9. PZ/LS-03 - Madhavaram Redhills Road. 10. KTV/LS-01 - Gangadharan Street, near GCC Park.

		11. MT/LS-01 - Manali Kosappur Road, near Kamarajar Salai
6.	Sewage Treatment Plant (Existing)	1. Kodungaiyur STP - Total installed capacity of 350 MLD is adequate to handle sewage generation of 37.99MLD
7.	No. House Service Connections	18581 Nos
8.	Quantity to be collected (MLD)	Ultimate Average flow of 37.99MLD (Total of Proposed).

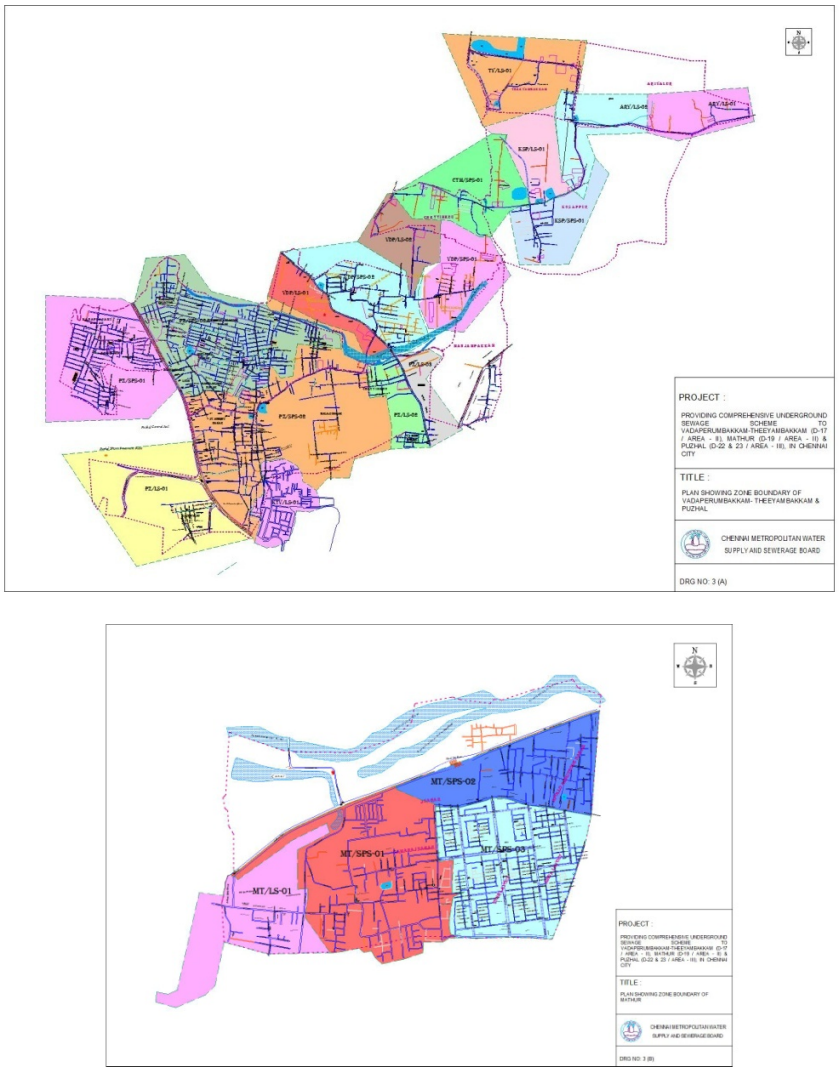


Figure 7 Collection System with zone boundary of Project area

S.NO	LOCATION	LS/SPS
1.	Samuel Nagar Burial Ground	VDP/SPS-01
2.	Perumal Koil Street	VDP/SPS-02
3.	Mariammankovil street, Chettimedu.	CTM/SPS-01
4.	Perumal Koil Street, Manali Kosappur Road	KSP/SPS-01
5.	Kannappa Swamy Nagar 26th Street	PZ/SPS-01
6.	Dhanalakshmi Nagar 2nd Street	PZSPS-02
7.	Balaji Nagar 3rd Main Road (Opp. To Taluk Office)	PZ/SPS-03
8.	Manali Kosappur Road	MT/SPS-01
9.	Bharathi Nagar 3rd Street	MT/SPS-02
10.	MMDA 3rd Main Road	MT/SPS-03
11.	Perumal Koil Street	ARY/LS-01
12.	Perumal koil Street, Periyar Nagar	ARY/LS-02
13.	Pillayar Koil Street	TY/LS-01
14.	Madhavaram Redhills Road	VDP/LS-01
15.	Annai Nagar	VDP/LS-02
16.	SendrambakkamKosappur Road	KSP/LS-01
17.	Service Road of Grant Northern Trunk (GNT)Road, near to Bus stop	PZ/LS-01
18.	Abinandha Street, Vegetarian Nagar	PZ/LS-02
19.	Madhavaram Redhills Road (Opp. To JK Mahal)	PZ/LS-03
20.	Gangadharan Street, near GCC Park	KTV/LS-01
21.	Manali Kosappur Road	MT/LS-01

Table 3: Name of the Collection system locations

Table 4: Population Projection

Based on Population density method to be calculated

SL NO	NAME OF THE ULB	DESIGN YEAR		
		2025	2040	2055
1.	Puzhal	52894	91640	158766
2.	Kathirvedu	12428	21110	35857
3.	Vadaperumbakkam-Theeyambakkam	28262	52871	77565
4.	Mathur	36769	46515	56260
	Total	**130353**	**212136**	**328448**

While estimating the flow in sewers 80% of 150 LPCD of water supplied and infiltration at the rate of 250L/D/MH for project area (Puzhal, Kathirvedu [left out streets], Mathur, Vadaperumbakkam, Theeyambakkam) has been adopted.

2.1.1 Collection System of Project area

Proposed UGSS project involves laying of sewerage collection system planned mostly at Mid of the roadway, construction of Machine holes at every 30mts interval. Machine holes are of three types, RCC precast Machine holes from 1.0m to 2.5m and RCC cast in situ Machine holes for the depth beyond 3m.

Table 5: Details of Collection System

Pipe Size (Dia. In mm) DWC PIPELINE	Length of pipe (m)	%
250	173341	94.52
300	2990	1.63
400	3087	1.68
500	1325	0.72
600	340	0.19
Total	**181083**	98.74
Pipe Size (Dia. In mm) CI PIPELINE	**Length of pipe (m)**	**%**
250	505	0.28
300	35	0.02
400	360	0.20
500	127	0.07
700	890	0.49
750	384	0.21
Total	**2301**	**1.26**
Total network length	**183.384**	**100**

Table 6: Details of Machine holes (Depth wise in m)

MH Type	Total No.	%
Brick Work using SRC		
1.0	2111	29.79
1.5	2022	28.53
Pre cast		
1	181	2.55
1.5	251	3.54
2	927	13.08
2.5	607	8.56
RCC cast in-situ Manholes		
3	398	5.62
3.5	251	3.54
4	187	2.64
4.5	118	1.67
5	21	0.30
5.5	11	0.16
6	2	0.03
Total	**7087**	**100**

2.1.2 Pumping station and Pumping mains

Lift station

Basically, Lift Station are the bigger sized RCC well fitted with two no. of Submersible pumps, which will pump the sewage received here through CI Pumping mains either to elevated Machine holes in other zone or to the pumping stations. Lift Station (Suction well) are totally buried within the ground, covered with RCC cover slab with openings for operation and maintenance, cover slabs are designed for maximum wheel loads expected in those roads. Hence, vehicles are allowed freely to run over these LS and will not be a hurdle for traffic. To control pump operations, a kiosk would be erected on side of footpaths, hence there will not be any superstructure in lift Stations.

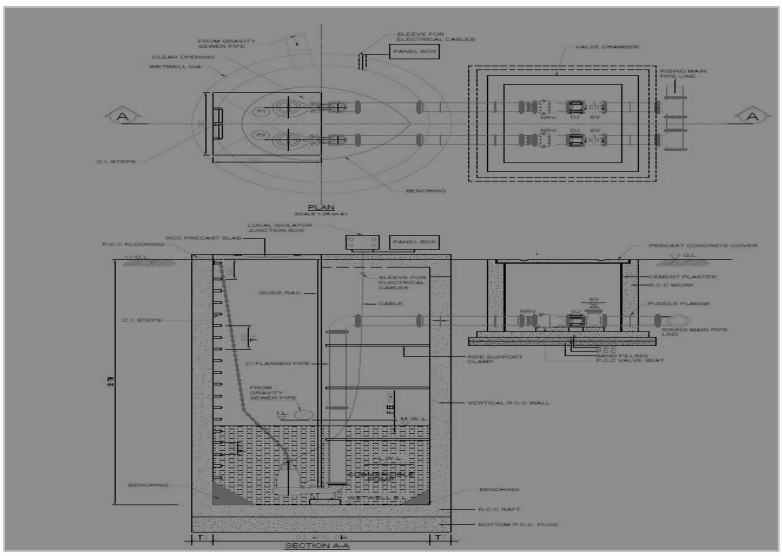


Figure 8: General layout of lift station

Sewage Pumping Station

Pre identified government sites, which would not require land acquisition are preferred for locating pumping stations. Full-fledged sewage pumping station includes, Screen cum grit well, fitted with manually operated screen with provision for grit collection and grit pumps. Suction well would be the next component which will receive sewage from screen cum grit well, 3 non clog submersible sewage pumps would be functioning in and convey sewage to collection system of next zone or if it is a terminal station, pumping to annexed STP.

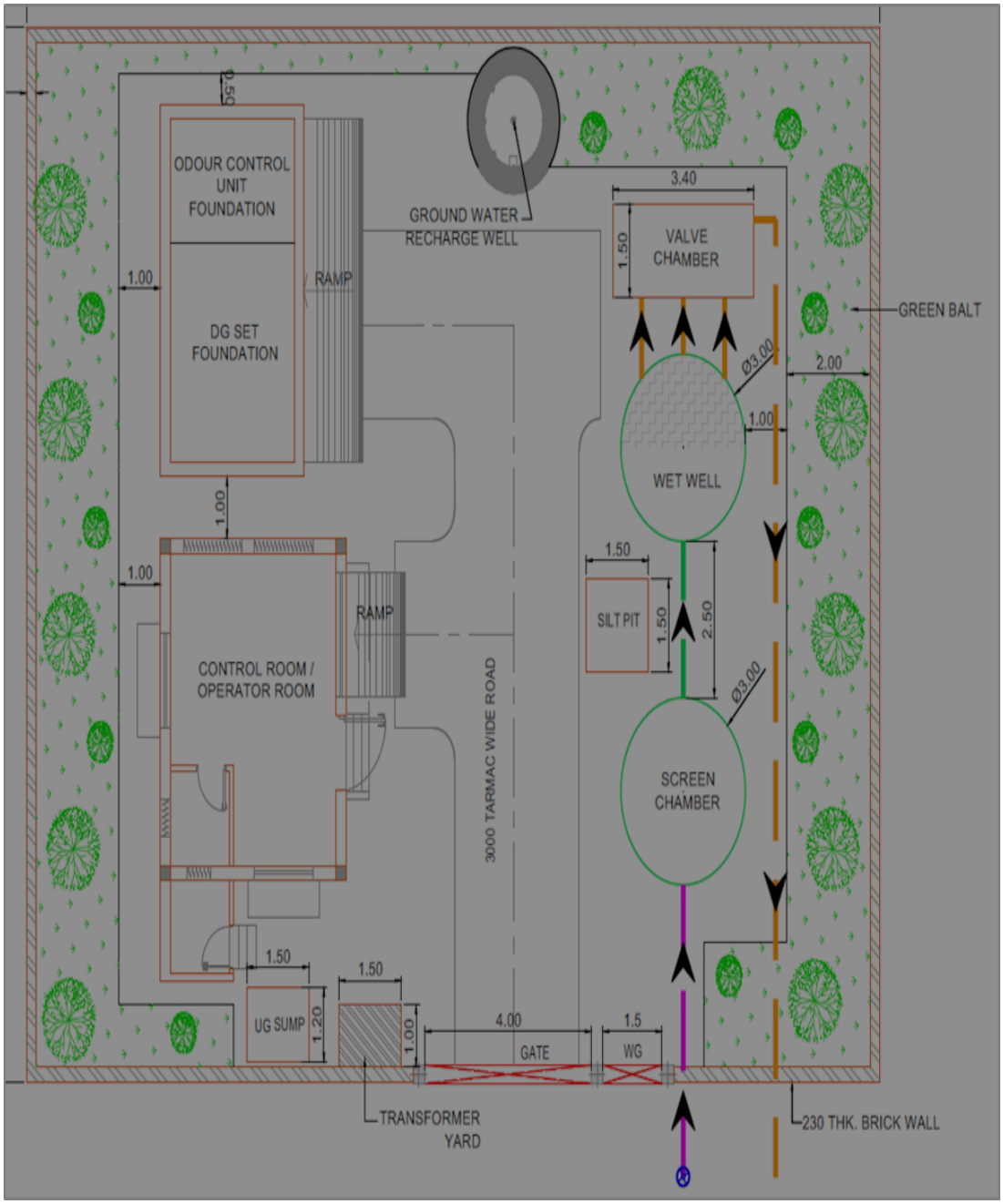


Figure 9: General Layout of pumping station

(iv)Pumping main

Cast iron Pumping mains are the carriers of sewage to final destiny and pumping mains will be laid on shoulders at a depth of 1.5mts to 2.0m for a length of 30.57 Km

Table 7: Details of Pump stations & Pumping main

Sl. No	LS/SPS	Name of Location	Peak Flow 2055 (MLD)	Depth/Dia of suction well (m)	Dia/ Length of PM (mm/m)	PM passing through streets
VADAPERUMBAKKAM - THEEYAMBAKKAM						
1.	VDP/SPS-01	Samuel Nagar Burial Ground	9.80	7.41/5.0	350/1410	Samuel Nagar, Burial Ground
2.	VDP/SPS-02	Perumal Koil Street	8.19	8.13/5.0	350/1500	Samuel Nagar Burial Ground Road.
3.	CTM/SPS-01	Mariammankovil street, Chettimedu.	13.21	7.57/6.0	450/1110	Kosappur Andarkuppam Road.
4.	KSP/SPS-01	Perumal Koil Street, Manali Kosappur Road	31.66	9.23/8.0	600/1400	Manali Kosappur Road.
5.	ARY/LS-01	Perumal Koil Street	6.32 (Inclusive of Kadapakkam flow – 3.34MLD)	7.43/2.5	300/1620	Kosappur – Andarkuppam Road.
6.	ARY/LS-02	Perumal koil Street, Periyar Nagar	12.71	7.27/4.00	450/1465	AndarkuppamRedhills Road
7.	TY/LS-01	Pillayar Koil Street	3.66	7.40/2.5	250/1460	Vichoor road, Andarkuppam-Redhills Road, Perumal Koil Street, Periyar Nagar
8.	VDP/LS-01	Madhavaram Redhills Road	1.20	6.79/2.5	150/30	Madhavaram Redhills Road.
9.	VDP/LS-02	Annai Nagar	1.80	5.26/2.5	150/805	Annai Nagar of Vadaperumbakkam
10.	KSP/LS-01	Sendrambakkam Kosappur Road	0.73	6.40/2.50	150/90	KosappurAndarkuppam Road
PUZHAL & KATHIRVEDU						
11.	PZ/SPS-01	Kannappa Swamy Nagar 26th Street	11.47	7.95/6.0	400/2430	Thiruneelakandar 2nd Street.
12.	PZSPS-02	Dhanalakshmi Nagar 2nd Street	28.11	7.71/8.0	600/2050	Balaji Nagar 3ed Manin Road.

13.	PZ/SPS-03	Balaji Nagar 3rd Main Road (Opp. To Taluk Office)	50.96	8.20/8.0	800/4240	Madhavaram – Redhills Road and 100ft Road.
14.	PZ/LS-01	Service Road of Grant Northern Trunk (GNT)Road, near to Bus stop	4.39	4.39/2.5	250/160	Near Taluk office
15.	PZ/LS-02	Abinandha Street, Vegetarian Nagar	2.78	6.12/2.5	200/330	Vegetarian Nagar Main Road
16.	PZ/LS-03	Madhavaram Redhills Road (Opp. To JK Mahal)	1.13	5.20/2.5	150/450	Madhavaram Redhills Road and crossing near Krishna Nagar Main Road
17.	KTV/LS-01	Gangadharan Street, near GCC Park	2.48	7.19/2.5	200/750	Ottivadai Street.
		MATHUR				
18.	MT/SPS-01	Manali Kosappur Road	89.20	10.01/8.0	1000/6570	Nehruji Nagar 35th street, Ponniammankovil street, Kamarajar salai, Velu Street.
19.	MT/SPS-02	Bharathi Nagar 3rd Street	3.19	7.36/3.5	250/1380	China Mathur Road.
20.	MT/SPS-03	MMDA 3rd Main Road	10.37	7.14/5.0	400/1100	MMDA 1st Cross Street, Madhavaram Milk Colony Road.
21.	MT/LS-01	Manali Kosappur Road	1.89	6.94/2.5	150/220	Manali Kosappur Road

Figure 10:Location of lift Stations and Pumping Station

2.1.3 Infrastructure (PS/LS) sites

Based on the sites allotted by the erstwhile local body and presently owned by Corporation of Chennai, zoning of sewerage system has been formulated by CMWSSB covering the project area as given below in Table 8.

Table 8 Location & size of land required for construction of pumping stations

SL. No.	Location	LS / SPS	Coordinates	Location of Pumping Station	Survey No.	Classification	Ownership	Extent of land required (Sq. m)	Existing Land use on site	Remarks
	VADAPERUMBAKKAM - THEEYAMBAKKAM									
1	Lift Stations	ARY / LS-01	13°11'26.3"N 80°15'03.8"E	Perumal Koil Street	-	-	GCC	16 Sq.m	Existing OHT site	Road side
2	Lift Stations	ARY / LS-02	13°11'28.8"N 80°14'18.6"E	Perumal koil Street, Periyar Nagar	-	-	CMWSSB	80 Sq.m	Existing filter bed	Under CMWSSB posse

S L. N o.	Loca tion	LS / SPS	Coordi nates	Location of Pumping Station	Surv ey No.	Classifi cation	Owner ship	Exte nt of land requi red (Sq. m)	Exist ing Land use on site	Rema rks
									site	ssion
3	Lift Statio ns	TY / LS-01	13°11'4 0.8"N 80°13'5 7.2"E	Pillayar Koil Street	-	-	GCC	16 Sq.m	Vaca nt land	Road side
4	Lift Statio ns	VDP / LS-01	13°10'3 0.9"N 80°12'5 5.0"E	Madhavaram Redhills Road	21	Grama natham	CMWS SB	45 Sq.m	Existi ng Bore well cum OHT site	Under CMW SSB posse ssion
5	Lift Statio ns	VDP / LS-02	13°10'5 3.5"N 80°13'2 2.6"E	Annai Nagar	-	-	GCC	16 Sq.m	Vaca nt land	Road side
6	Sub pump ing Statio n	VDP / SPS-01	13°10'3 9.3"N 80°13'3 4.5"E	Samuel Nagar Burial Ground	201/ 33	Burial Ground	GCC	624 Sq.m	Buria l grou nd	NOC obtain ed from GCC
7	Sub pump ing Statio n	VDP / SPS-02	13°10'3 3.3"N 80°13'0 4.8"E	Perumal Koil Street	96/1	Grama natham – Govt. Poramb oke	Reven ue	806 Sq.m	Vaca nt land	GO (Ms) No.26 7, dt. 17.07. 2015 obtain ed from Reven ue Dept
8	Sub pump ing Statio n	CTM / SPS-01	13°10'5 1.8"N 80°13'4 5.7"E	Mariamman Koil Street, Chettimedu	19	Meikkal	Reven ue	676 Sq.m	Vaca nt land	Enter upon permis sion obtain ed from Reven ue Dept
9	Lift Statio ns	KSP / LS-01	13°10'5 5.9"N 80°14'0	Sendrambakka mKosappur Road	-	-	GCC	16 Sq.m	Vaca nt land	Road side

S L. N o.	Loca tion	LS / SPS	Coordi nates	Location of Pumping Station	Surv ey No.	Classifi cation	Owner ship	Exte nt of land requi red (Sq. m)	Exist ing Land use on site	Rema rks
			5.2"E							
1 0	Sub pump ing Statio n	KSP / SPS-01	13°11'2 3.0"N 80°14'1 9.0"E	Perumal Koil Street, Manali Kosappur Road	165	Grama natham	CMWS SB	378 Sq.m	Existi ng OHT site	Under CMW SSB posse ssion
	PUZHAL & KATHIRVEDU									
1 1	Lift Statio ns	PZ / LS-01	13°09'0 7.3"N 80°12'3 4.3"E	Service Road of Grant Northern Trunk (GNT)Road, near to Bus stop	-	-	GCC	16 Sq.m	Vaca nt land	Road side
1 2	Lift Statio ns	PZ / LS-02	13°09'5 0.1"N 80°12'5 9.4"E	Abinandha Street, Vegetarian Nagar	-	-	GCC	16 Sq.m	Vaca nt land	Road side
1 3	Lift Statio ns	PZ / LS-03	13°10'0 0.2"N 80°13'2 4.5"E	Madhavaram Redhills Road (Opp. To JK Mahal)	-	-	GCC	16 Sq.m	Vaca nt land	Road side
1 4	Lift Statio ns	KTV / LS-01	13°09'2 9.7"N 80°12'3 4.6"E	Gangadharan Street, near GCC Park	-	-	GCC	16 Sq.m	Vaca nt land	Road side
1 5	Sub pump ing Statio n	PZ / SPS-01	13°10'1 7.6"N 80°11'4 3.4"E	Kannappa Swamy Nagar 26th Street	443/ 2A2	-	CMWS SB	960 Sq.m	Existi ng OHT site	Under CMW SSB posse ssion
1 6	Sub pump ing Statio n	PZ / SPS-02	13°10'1 5.7"N 80°12'3 6.5"E	Dhanalakshmi Nagar 2nd Street	279	Kuttai	Reven ue	990 Sq.m	Vaca nt land	Letter for Land acquis ition has been sent to Reven ue Dept
1 7	Sub pump ing Statio	PZ / SPS-03	13°09'5 0.1"N 80°12'5 9.4"E	Balaji Nagar 3rdMain Road (Opp. To Taluk Office)	120	Panchar	Reven ue	750 Sq.m	Vaca nt land	Enter upon permis sion

S L. N o.	Loca tion	LS / SPS	Coordi nates	Location of Pumping Station	Surv ey No.	Classifi cation	Owner ship	Exte nt of land requi red (Sq. m)	Exist ing Land use on site	Rema rks
	n									obtain ed from Reven ue Dept
	MATHUR									
1 8	Lift Statio ns	MT / LS-01	13°10'0 5.5"N 80°14'1 0.8"E	Manali Kosappur Road	-	-	GCC	16 Sq.m	Vaca nt land	Road side
1 9	Sub pump ing Statio n	MT / SPS-01	13°09'4 8.3"N 80°14'4 2.4"E	Manali Kosappur Road	136/ 2A1 (Part)	-	CPCL layout	375 Sq.m	OHT site	Under CMW SSB posse ssion
2 0	Sub pump ing Statio n	MT / SPS-02	13°10'4 0.2"N 80°15'0 6.5"E	Bharathi Nagar 3rd Street	68	-	CMWS SB	40 x 40 m	Vaca nt land	Under CMW SSB posse ssion
2 1	Sub pump ing Statio n	MT / SPS-03	13°10'0 2.9"N 80°15'0 0.4"E	MMDA 3rd Main Road	LP, S&S, MM DA-6/90	-	CMWS SB	31 x 25 m	Existi ng SPS site	Under CMW SSB posse ssion

2.2 Kodungaiyur STP

The total capacity of STP is 350MLD and its sub divided into to two 120 MLD and 110 MLD as its function. The sub project use of 110 MLD of sewage and the treatment process is based on activated sludge process with anaerobic sludge digestion and biogas utilization by means of a power plant based on gas engine (capacity 1,317 KVA). After commissioning in 2006, M/s. WABAG Ltd., assumed responsibility for operations & maintenance of the plant for over a period of 12 years. It is thelargest plant of its kind in India and the most energy efficient one among the 9 STPs in Chennai – achieving 98% self-sufficiency in terms of power consumption.

One of the largest Power Neutral Plant of India and achieves 98% self-sufficiency in terms of power consumption. Enables reuse of treated wastewater to reduce the burden on freshwater-relevant especially in a city like Chennai which depends on groundwater. Supplies 21 MLD of Treated Sewage to nearby Chennai Petro Chemicals Limited & 5 MLD of treated Sewage to Manali Petro Chemicals for industrial uses. 84 MLD treated wastewater routed to nearby Buckingham canal reducing environment pollution. Silt generated from Inlet chamber is being used to raise the entire low lying area of the plant.

Figure 11: Location of existing Sewage Treatment Plant at Kodungaiyur

The sewage generated from Project area for the Intermediate year 2040 and ultimate year 2055 is 25.11 MLD & 37.99MLD respectively and is proposed to be discharged into the existing STP at Kodungaiyur.

The capacity of Kodungaiyur STP including present and under construction capacities will handle the designed flow from this project.

2.2.1Associated Facilities

Adequacy

The Kodungaiyur STP campus has 2 STPs. They are 80 MLD capacity and 110 MLD capacity STP. The construction of two new STPs with the capacity of 120 MLD each shall be commissioned in June 2023. The existing 2 numbers of 80 MLD will be de-functioned after the commissioning of the new 120 MLD STPs. The total capacity of all the STPs is 350 MLD which is adequate to take the capacity of 16.93 MLD sewage generated from the proposed project area.

Performance

The existing STP with the technology of Activated Sludge Processing at Kodungaiyur has the total capacity of 270 MLD (2 numbers of 80 MLD and one 110 MLD). The current flow of sewage being received is 230 MLD. The ongoing construction of new STP with SBR technology will replace the existing 80 MLD STP to meet the latest discharge norms of TNPCB. The rehabilitation of 110 MLD from activated sludge processing to MBBR is going on and will be completed by Dec. of 2023.

Regulatory compliance

- Kodungaiyur STP: TNPCB is checking the discharged treated water periodically. As per TNPCB observations the threshold limits of discharge norms as required by TNPCB/Central Pollution Control Board (CPCB) within the prescribed limits. The STP are functioning properly and the treated effluent is discharged as per TNPCB norms.
- Currently, the digested sludge is then fed into mechanical centrifuge. The dewatered sludge cakes is then collected and disposed inside the STP premises for land filling.

2.2.3 Recycle and Reuse of Waste Water

- Water reuse accomplishes three fundamental functions:

    - ✓ Treated wastewater is used as a water resource for beneficial purposes,
    - ✓ Treated effluent is kept out of streams, lakes, etc, reducing the pollution of surface and ground water
    - ✓ Protects public health.

- Water recycling and reusing treated wastewater for beneficial purposes such as agricultural and landscape irrigation, industrial processes, toilet flushing, and replenishing water reservoirs (ground water recharge) offers resource and financial savings. Wastewater treatment can be tailored to meet the water quality requirements of a planned reuse. The use of waste water at decentralized sites reduces the amount of potable water required for other uses and applications.

- The present inflow of sewage received, treated and discharged from Chennai City is 600 MLD (average), out of which 23 MLD of secondary treated water is supplied for Industrial purposes commencing from the year 1993 and 0.23 MLD is supplied to GCC & TNRDC for landscaping and gardening purposes.

- Further, 2 Nos of Tertiary Treatment and Reverse Osmosis Plant (TTRO plants) each of 45 MLD capacity at Koyambedu and Kodungaiyur are commissioned. Currently average of 41 MLD are supplied to theIndustries.

- After careful consideration, the GoTN issued in principle approval vide G.O No 131 (MS) MAWS Dt.10.12.2018 for two proposals of each 10 MLD capacity for recycle and recharge of tertiary treated water TTUF from Nesapakkam STP and Perungudi STP to Porur and Perungudi lakes.

- The Tertiary Treated Ultra Filtration (TTUF) in Nesapakkam has been completed and the trial operations have begun.

2.2.4 Climate Resilience

Energy Efficiency

- To optimize the power consumption, the Variable Frequency Drive (VFD) for pumps have been proposed in all 10 No of SPS.

- Around 30-40% of energy consumption can be reduced by adopting VFD starter instead of conventional starter. Comparison of conventional starters vs VFD starter and energy saving calculation is attached in Annexure 6

- LED lamps are proposed to be used in all SPS.

Emission Reduction

- DG sets provided in the project are as per standards for emission as prescribed by pollution control board
- To reduce noise pollution DG sets are provided with acoustic enclosure.

Flood

- The city has been highly vulnerable to extreme weather and erratic rainfall, including periodic droughts and floods.

- Finished Floor Level (FFL) in all SPS has been fixed above the Maximum Flood Level (MFL) occurred during 2015 and marked visibly in wall.

- One dewatering pumping would be kept on a platform above the MFL for pumping water from the pump pit.

- This project envisages the construction ofPipe carrying bridge across Kosasthalaiyar River. NOC will be obtained from the concerned departmentand terms & conditions stipulated by the department will be complied with conditions given by the Public Works Department without hindrance to the flow obstruction during flood and cleaning of waterways.

CHAPTER-3 Legal and Regulatory Framework

In this section, the prevailing key National, State level laws, rules, policies, Acts, notifications pertaining to environmental, climate change and social aspects have been reviewed for their applicability to the proposed UGSS to Puzhal & Kathirvedu (left out streets) , Mathur, Vadaperumbakkam, Theeyambakkam and provided in the following table.

Table 9: National and State Regulations on Environmental, Climate Change and Social aspects

Sl. No.	Acts/ Rules/ Regulations	Description	Relevance to sub-project
1.	Wildlife Protection Act, 1972	This Act seeks to protect wildlife, by creating protected areas and controlling trade in wildlife products. Project activities that cross over into protected area regimes then requisite permission must be obtained.	Not Applicable.
2.	Water (Prevention And Control of Pollution) Act, 1974 and Tamil Nadu Water (Prevention And Control of Pollution) Rules, 1974	These laws seek to control pollution of water and enhance the quality of water. Under this law, it is mandatory to obtain consent for discharge of effluents and pay consent fees to Tamil Nadu State Pollution Control Board (TNPCB) for any municipal projects causing water pollution.	Applicable. Activities involving emission of pollutants like establishing batch mixing plants require consent from TNPCB.
3.	The Water (Prevention And Control of Pollution) Cess Act, 1977	This Act provides for levy and collection of a cess by local authorities on water consumed by persons or industries to augment resources for Pollution Control Boards.	Provisions are applicable.
4.	Forest (Conservation) Act, 1980	Forest (Conservation) Act, 1980 was enacted to halt rapid deforestation and governments cannot de-reserve forest land or direct that it be used for non-forest purposes.	Not Applicable. None of the project attracts the provisions.
5.	Air (Prevention and Control of Pollution) Act 1981 and Tamil Nadu Air (Prevention of Control of Pollution) Rules 1983	These laws address the prevention and control of air pollution. Under section 21 of this Act, it is mandatory to obtain consent from Pollution Control Board to establish or operate any industrial operation.	Applicable. Activities involving emission of pollutants like establishing batch mixing plants require consent from TNPCB.
6.	Environment (Protection) Act, 1986	Popularly known as EP Act, it is an umbrella legislation that	Applicable.

Sl. No.	Acts/ Rules/ Regulations	Description	Relevance to sub-project
		supplements existing environmental regulations. This law essentially links pollution and natural resource issues.	
7.	Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 (MSIHC Rules, 1989)	These rules aim at providing control for the generation, storage and import of hazardous chemicals. According to these rules, the user of hazardous chemicals has to follow procedures as stipulated in the rules to prevent and control hazards from such chemicals and to ensure safety and permission has to be obtained from the authority concerned for such activity. The list of chemicals and threshold limits of handling falling under the purview of these rules is provided in the schedule to the rules.	Applicable. Hazardous chemicals if any stored/used for the project attracts the provisions.
8.	Hazardous and Other Wastes Management Rules, 2016	This law addresses handling of hazardous and other wastes that fall under specified schedules and necessitates authorisation for such facilities from State Pollution Control Board. Projects attracting these rules will have to follow the guidelines for handling and disposal of hazardous wastes. Measures include storage on a paved surface in a designated area with adequate secondary containment, with adequate labelling and before it is disposed to TNPCB approved vendor.	Applicable. During the construction and during operation, wastes and used oils will be generated which shall be stored and disposed as per the requirements of the rules.
9.	Public Liability Insurance Act, 1991	This act provides for providing immediate relief to the persons affected by accident occurring while handling any hazardous substance and for matters connected therewith.	Applicable.
10.	Bio Medical Waste Management Rules, 2016	This notification by MoEF & CC lays down the method of collection of hospital waste, its transportation and disposal based on scientific methods.	Not applicable.

Sl. No.	**Acts/ Rules/ Regulations**	**Description**	**Relevance to sub-project**
11.	Fly Ash Notification, 2021	This notification necessitates use of fly ash for various construction activities like road laying, road and flyover embankments, shoreline protection structures in coastal districts, building construction projects etc within 300 km from the lignite or coal based thermal power plants.	Not Applicable.
12.	Solid waste Management Rules 2016	This notification by Ministry of Environment and Forest lays down the methods of handling Municipal Solid Waste and its scientific disposal. Establishing a facility for disposal requires authorisation from State Pollution Control Board.	Applicable. Solid wastes from the construction/ labour camps are to be handled in compliance with the provisions of the rules.
13.	The Noise Pollution (Regulation and Control) Rules, 2000	The ambient noise quality standards for different areas/zones namely industrial, commercial, residential or silence areas/zones are specified in the Schedule of these rules. An area comprising not less than 100 metres around hospitals, educational institutions and courts may be declared as silence area/zone as per these rules.	Provisions are applicable. The noise levels (during construction and during operation of pumping stations) shall not exceed the ambient air quality standards in respect of noise as specified in the Schedule.
14.	EIA Notification, dt 2006 (S.O.1533(E), dt.14/09/2006) and subsequent amendments	The notification specifies that prior environmental clearance is required for the projects listed in the schedule of the notification before any construction work, or preparation of land by the project management except for securing the land, is started on the project or activity. The Schedule of the notification lists eight broad categories of projects that require prior environmental clearance.	Not Applicable.
15.	Wetlands (Conservation and Management) Rules, 2017	The rules list the wetlands that needs to be protected like those covered under Ramsar Convention, those in UNESCO heritage site, those which are ecologically sensitive etc.	Not Applicable. There are no such wetlands within the project area.
16.	The National Green Tribunal Act, 2010	This act provides for establishment of National Green Tribunal for effective and expeditious disposal	Provisions are applicable.

Sl. No.	Acts/ Rules/ Regulations	Description	Relevance to sub-project
		of cases relating to environmental protection and conservation of forests and other natural resources including enforcement of any legal right to environment and giving relief and compensation for damages to persons and property and for matters connected therewith or incidental. The National Green Tribunal established under this act is a specialized body equipped with the necessary expertise to handle environmental disputes involving multi-disciplinary issues. The Tribunal shall not be bound by the procedure laid down under the Code of Civil Procedure, 1908, but shall be guided by principles of natural justice.	
17.	E-Waste (Management and Handling) Rules, 2016	The rules prescribe procedures for manufacture, collection, dismantling, recycling, and disposal of electronic wastes and requires authorisation of the State Pollution Control Board for the same.	Not applicable.
18.	Plastic waste (Management &handling) Rules 2016	This rules provides for collection, segregation, processing, treatment and disposal of the plastic waste in an environmentally sound manner, restriction on thickness of plastic sheet or like, prohibition on identified use, extended producer responsibility, marking and labelling requirement, registration of manufacturer, producer, importer, brand owner and plastic waste processor, reducing the plastic waste generation.	Not applicable.
19.	Prohibition of Employment as Manual Scavengers ‘and their Rehabilitation Act 2013	This act prohibits construction of insanitary latrines and employment or engaging of manual scavenger for the purpose of manual scavenging. No person, local authority or any agency shall, from such date as notified by the State Government (which shall not be	Provisions are applicable.

Sl. No.	Acts/ Rules/ Regulations	Description	Relevance to sub-project
		later than one year from the date of commencement of this Act), engage or employ, either directly or indirectly, any person for hazardous cleaning of a sewer or a septic tank.	
20.	National Action Plan on Climate Change	India is faced with the challenge of sustaining its rapid economic growth while dealing with the global threat of climate change.	Provisions are applicable for relevant projects.
21.	Energy Conservation Act, 2001	Aims to reduce specific energy consumption in different sectors and sets up a specialized Bureau of Energy Efficiency to institutionalize energy efficiency measures, monitoring, and measurement at plant and macro-levels.	Provisions are applicable for relevant projects.
22.	Energy Conservation Building Code (ECBC)	The Energy Conservation Act 2001 that was passed by the Indian Parliament empowered the Central Government to prescribe an Energy Conservation Building Code (ECBC). This code applies to new commercial buildings with a connected load of 100 kW & more or contract demand of 120 kVA or more; Introduces passive design features such as daylight requirements and shading provisions; Introduces provisions of installing Renewable Energy Systems; Sets minimum energy efficiency standards for design and construction; Encourages energy efficient design or retrofit of buildings .	Not Applicable.

Sl. No.	Acts/ Rules/ Regulations	Description	Relevance to sub-project
23.	The Ancient Monument and Archaeological Sites and Remains (Amendment and Validation) Act 2010	The Rules designate areas within a radius of 100 m and 200 m from the “protected property/ monument/ area” as “prohibited area” and “regulated area” respectively. Hence, no permission for construction of any public projects or any other nature shall be granted in the prohibited areas of the protected monument and protected area In respect of regulated area, the competent authority may grant permission for construction, reconstruction, repair and renovation based on recommendation of the National Monument Authority duly taking note of heritage bye-laws, which shall be prepared in respect of each protected monument and protected areas.	Not relevant. However, in case of chance finds, provisions are applicable.
24.	The Right to Fair Compensation and transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (LARR)	The Act provides for enhanced compensation and assistances measures and adopts a more consultative and participatory approach in dealing with the Project Affected Persons. This act came into effect on 1 January 2014 and the Land Acquisition Act, 1894 stands repealed. The Act lays down procedures for estimating fair compensation of the affected families (and not just the titleholders) due to land acquisition, rehabilitation and resettlement. The Act is notified by the GoTN on 21 September 2017 (G.O. Ms. No. 298, Revenue & Disaster Management (LA-I(1), 20th September 2017).	Provisions of this Act is relevant to this project.
25.	The Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006	It grants legal recognition to the rights of traditional forest dwelling communities.	Not applicable

Sl. No.	Acts/ Rules/ Regulations	Description	Relevance to sub-project
26.	The Child Labour (Prohibition and Regulation) Amendment Act, 2016. The Child Labour (Prohibition and Regulation) Act,1986	No child below 14 years of age will be employed or permitted to work in any of the occupations set forth in the Act's Part A of the Schedule or in any workshop wherein any of the processes set forth in Part B of the Schedule. Child can help his family or family enterprise, which is other than any hazardous occupations or processes set forth in the Schedule, after his school hours or during vacations.	Applicable.
27.	The Occupational Safety, Health And Working Conditions Code, 2020	This code consolidates and amends the laws regulating the Occupational safety and health and working conditions of the persons employed in an establishment. The Act replaces 13 old central labour laws like The Factories Act, 1948, The Building and other Construction Workers Act, 1996, The Mines Act, 1952, The Inter-State Migrant Workmen Act, 1979, etc	Applicable. Stipulations of the code are to be complied with during construction.
28.	Code on Wages, 2019	The Code on Wages seeks to regulate wages & bonus payments in all employments. The code subsumes four existing acts namely, The Equal Remuneration Act, 1976, The Minimum Wages Act, 1948, The Payment of Bonus Act, 1965, The Payment of Wages Act, 1936.	Applicable. Stipulations of the code are to be complied with during construction.
29.	Workmen Compensation Act, 1923.	The Act provides for compensation by the employer to their workmen in case of injury by accident arising out of and during employment.	Applicable.
30.	Coastal Regulation Zone (CRZ) Notification, 2019	This notification under Environment (Protection) Act, 1986 supplements the law on site clearance by declaring certain zones as CRZ and regulates activities in these zones. Projects attracting this notification shall obtain CRZ clearance for implementation from the authority as required.	Applicable.Asectionoftheproject alignment fallsundertheCRZpurview. Hence CRZ Clearanceistobeobtained prior to startof work in the area.

Sl. No.	Acts/ Rules/ Regulations	Description	Relevance to sub-project
	State Regulations		
31.	Chennai Metropolitan Area Ground water (Regulation) Amendment Act, 2002	This amendment to the original act was made to impose provision of rainwater harvesting in every building either private or government to augment ground water storage in such manner as may be prescribed. The act also mentions that water bodies, including ponds, lakes, tanks and the like, whether public or private should be used only for the purpose of storage of water and not for any other purposes. These provisions are also included in the Panchayats Act and the Municipal Act.	Provisions are applicable
32.	The Tamil Nadu Preservation of Private Forest Act, 1949	Guidelines for extraction of trees from non-forest area stipulates that permission for tree cutting shall be taken from State Forest department	Applicable.
33.	The Tamil Nadu Hill Areas (Preservation of Trees) Act, 1955	This Act regulates the cutting of trees and cultivation of land in hill areas of Tamil Nadu, (Coonoor, Kodaikanal, Kotagiri, Ootacamund, Yercaud). Any tree cutting in these areas requires permission from the Committee under this Act.	Not Applicable.
34.	The Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, 2014 and Rules 2015 notified by GOTN.	The Street Vendors Act came into force on March 5, 2014, and seeks to protect the livelihoods of street vendors while regulating street vending. The Act recognizes street vendors of different types including mobile (moving) vendors, stationary (vending from a particular place), natural markets (spaces where buyers and sellers traditionally congregate), vendors with temporary built-up structures, hawkers, peddlers and squatters. It provides for regulation of street vendors, defines the rights and duties of street vendors and requires definition of designated vending zones, issue of certificates of vending and identity cards to	Applicable if the project components are involved in the designated vending zones.

Sl. No.	Acts/ Rules/ Regulations	Description	Relevance to sub-project
		street vendors, and proposes vending fees and maintenance charges. Under the Act, each state government is required to define the public purpose for which a street vendor may be evicted and the manner of relocation, manner of giving notice, and provides for a dispute resolution mechanism. As per the Act, planning and regulation of street vending is to be undertaken at town level by the Town Vending Committee. The Act also provides for social audit of the activities of the Town Vending Committee. This act that specifically aims to protect the rights of urban street vendors and to regulate street vending activities. It provides for Survey of street vendors and protection from eviction or relocation; issuance of certificate for vending; provides for rights and obligations of street vendors; development of street vending plans; organizing of capacity building programmes to enable the street vendors to exercise the rights contemplated under this Act; undertake research, education and training programmes to advance knowledge and understanding of the role of the informal sector in the economy, in general and the street vendors, in particular and to raise awareness.	
35.	State Green Committee/District Green Committee	To consider the cutting of trees in public places and public offices. Ref G.O.(Ms).no.38 dated 02.07.2021 of the Environmental Climate Change and Forest (FR.13)Department, Government of Tamil Nadu	Applicable. Wherever tree cutting is envisaged, permission to be obtained.
36.	Occupational, Safety, Health and Working Conditions (Tamil Nadu) Rules 2022.	This draft rules notified on 11.04.2022	Applicable. Stipulations of the code are to be complied with during construction.

Sl. No.	Acts/ Rules/ Regulations	Description	Relevance to sub-project
37.	Code on Wages (Tamil Nadu) Rules, 2022	This draft rules notified on 11.04.2022	Applicable. Stipulations of the code are to be complied with during construction.
	Climate change		
38.	National action plan on climate change (30.06.2008) TNSAPCC, 31.03.2015	India is faced with the challenge of sustaining its rapid economic growth while dealing with the global threat of climate change. India, in 2008, has set up National Action plan on climate change (NAPCC) which outlined policies aimed at sustainable growth and dealing with climate change concerns effectively. NAPCC outlines eight national missions to address various adaptation and mitigation measures pertaining to Solar Energy, Enhanced Energy Efficiency, Sustainable Habitat, Water, Sustaining Himalayan Ecosystem, Green India, Sustaining Agriculture, Strategic Knowledge on Climate Change.	Provisions are applicable.
39.	Energy Conservation Act, 2001	Aims to reduce specific energy consumption in different sectors, and sets up a specialized Bureau of Energy Efficiency to institutionalize energy efficiency measures, monitoring, and measurement at plant and macro-levels.	Provisions applicable.
40.	Energy conservation building code:	The Energy Conservation Act 2001 that was passed by the Indian Parliament, empowered the Central Government to prescribe an Energy Conservation Building Code (ECBC). ECBC was launched in 2007 on a voluntary basis by the Bureau of Energy Efficiency (BEE and was revised in 2017. ECBC sets minimum energy efficiency standards for design and construction	Applicable.

Sl. No.	Acts/ Rules/ Regulations	Description	Relevance to sub-project
		encouraging energy efficient design or retrofit of buildings without constraining the building function, comfort, health, or the productivity of the occupants and appropriate regard for economic considerations. Mandatory Scope Covers commercial Buildings having their Connected Load of 100kW and above or contract demand 120kVA and above and is ECBC is recommended for all new buildings and additions to existing buildings with the total load exceeding 200KW or 120kVA.	
Safeguard Policies - Multilateral Funding Agencies			
41.	KFW's Sustainability Guideline (SG) Assessment and Management of Environmental, Social and Climate Aspects: Principles and Procedures, February 2022	The SG of KfW describes principles and procedures to assess the environmental, social and climate impacts during the preparation of FC measures financed by KfW. Objective of the guidelines is to define a common binding framework to incorporate environmental, social and climate standards into the planning, appraisal, implementation, and monitoring of FC measures and to enhance transparency, predictability and accountability in the decision-making processes of the internal environmental and social due diligence (ESDD) and climate mainstreaming.According to KFW's SG,World Bank Environmental and Social Standards (1-10) outlined in the World Bank Environmental and Social Framework (ESF) general and sector-specific ESHS guidelines& ILO standards are applicable and are to be complied with.	Applicable for the sub-project and compliance to be ensured during implementation.

Sl. No.	Acts/ Rules/ Regulations	Description	Relevance to sub-project
42.	The World Bank's ESF, 2018	The World Bank's Environmental and Social Framework (ESF) sets the World Bank's commitment to sustainable development through a Bank policy and a set of Environmental and Social standards that are designed to support borrowers projects, with the aim of ending extreme poverty and promoting shared prosperity. The ESF is the key E&S risk management tool which guides the borrowers to identify, assess, mitigate and report on project E&S risks, impacts and mitigation measures ant the effectiveness of their implementation. As per the guiding principles of the ESF, all projects funded by the World Bank require the borrowers to – (a) achieve compliance with all applicable federal/national, state and local laws and regulations related to environmental and social matters; and (b) meet the requirements of the Environmental and Social Standards (ESS) outlined in the World Bank's Environmental and Social Framework (ESF).	The project is evaluated against the E&S Standards and National Government Regulations are followed. ESS standards applicable to the project have been provided in Chapter 7 Table7.1 in this report. Accordingly, this ESIA & ESMP with SEP and GRM has been prepared. LMP/WMP is to be prepared by the prospective contractor prior to start of works.

3.1 Clearances/Permissions

3.1.1 Clearance to be obtained by CMWSSB

Sl No	Proposed activity	Statutory authority	Applicable legislation	Status
1.	Highway crossings including Trenchless Technology for laying of pipes.	GNT Road, NH, SH, TPP Highways.	National Highways Rules 1957.	To be applied
2.	Electrical and Electronic Connections for pumping stations/ lift stations	TNEB	Tamil Nadu Electricity Supply Code (as amended up to 31-12-2009)	To be applied

3.	Traffic diversion for Construction of collection system, Machine holes, roadside lift stations, pumping mains etc.,	Deputy Commissioner of Police Traffic Chennai	MoRTH 112 SP 55 of IRC codes	To be applied
4.	Delineation of land for construction of pumping stations.	District collector	Tamil Nadu Town and Country Planning Act, 1971 (Tamil Nadu Act 35 of 1972),	NOC obtained for all sites except PZ/SPS-02 (Refer Table 8)
5.	Laying of collection system, Pumping main, construction of Machine holes, Lift stations, pumping stations in CRZ zone	Tamil Nadu State Coastal Zone Management Authority (TNSCZMA)	Coastal regulation zone Notification 2011	Applicable
6.	Pipe Carrying Bridge construction across Kosasthalaiyar River	Public Works Department		Initiated by CMWSSB

3.1.2. Clearance to be obtained by the Contractor

Sl. no.	Construction Activity	Statutory Authority	Statute under which clearance is required	Implementation	Supervision
1	Labour Licence and all other statutory work permits including Contract Labour& Interstate Migrant Worker License (if any)	- The Contract Labour (Regulations & Abolition) Act, 1970 - The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996	Tamil Nadu Labour Department	Contractor	CMWSSB
2	Workmen compensation Insurance / Accident Insurance, EPF and ESIC (as applicable)	Tamil Nadu Labour welfare Fund Act	Tamil Nadu Labour Department	Contractor	CMWSSB
3	Hot mix plants, Crushers and Batching plants	Tamil Nadu Pollution Control Board (TNPCB)	Consent to establish And consent to operate under Air Act, 1981	Contractor	CMWSSB
4	Discharges from construction activities	TNPCB	Consent to establish and consent to operate under Water Act, 1974	Contractor	CMWSSB

Sl. no.	Construction Activity	Statutory Authority	Statute under which clearance is required	Implementation	Supervision
5	Sand mining, quarries and borrow areas	Department of Geology and mining, Government of Tamil Nadu	Contractor to obtain material from the existing Government licensed mines/quarries, Contractor will require prior approval of PIU for obtaining material from a particularsource.PIU to review and approve only existing licensed mines	Contractor	CMWSSB
6	Ground water extraction	Tamil Nadu Groundwater Development and Management Act 2000	CMWSSB	Contractor	CMWSSB
7	Temporary traffic diversion measures	MoRTH 112 SP 55of IRC codes	Traffic Police Chennai	Contractor	CMWSSB

CHAPTER – 4 Environmental and Social Baseline

This chapter presents the baseline data required to understand the environmental, ecological attributes and socio-economic characteristics of the study area, the pipeline route. The baseline includes climate, meteorology, topography, geology, hydrology, drainage, rainfall, land usage, water, air, noise, soil, flora, fauna and social profile of local population. The study was conducted along the stretch of sewage water pipeline traversing through urban areas of Puzhal and kathirvedu (Left our streets), Mathur, Vadaperumbakkam, Theeyambakkam (refered as study area) of Chennai Corporation, Tamilnadu state (referred as study area). The objective is to comprehend the current environmental conditions and Socio-Economic status of people which would help in comparing and assessing the impacts on E&S aspects caused by the project in pre-construction, construction and operation phases.

4.1 Methodology

The Baseline has been collected from the primary and secondary sources and E&S screening of all the project sites and alignments.

The desk review of the available documentation and reports of this project is carried out including DPR. The survey in the study area was conducted to identify the Potential Temporary Economic Impact's type and duration of impacts, entitlements, etc in the first week of Feb 2023. Also, the additional data were collected from relevant websites, online as well as offline. Data thus collected from the primary and secondary sources- published and unpublished literature, government documents, reports, etc were reviewed.

The ground truthing undertaken on-site, verified and updated the required data. The secondary information collected from different sources include the Ministry of Environment, Forest and Climate Change (MOEF&CC), Census of India 2011, District Census Handbook, Geological Survey of India, Indian Meteorological Department, State Pollution Control Board (SPCB), Underground Water department, PWD, tourism and other relevant departments of the state and Central governments. The data sources are indicated at Table 10.

Table 10: Sources of Environmental &Social data

S.No.	Attribute	Parameter	Source of Data
1	Land use /cover	Land use patterns	Satellite Imagery
2	Geology	Rock formation and mineral profile	Geological Survey of India and project site study
3	Air, water, noise, soil	Measurement levels	TNPCB
4	Meteorology	Temperature, cloud, wind, etc.	IMD Chennai other related metrological sources
5	Ecology	Existing terrestrial flora and fauna	GCC in chennai, WRD in india
6	Socio-economic aspects	Socio-economic characteristics	Census of India, 2011; District Hand Book, survey in project area

4.2 Features of Greater Chennai Corporation

The features such as Climate, Topography, Geology, Drainage, and Vegetative cover of Tamil Nadu state, Greater Chennai Corporation is described in following sections.

4.2.1. Climate

Tamil Nadu is heavily dependent on monsoon rains, and thereby is prone to droughts when the monsoons fail. The state has distinct periods of rainfall, which are the advancing monsoon period, South-west monsoon (from June to September) with strong southwest winds, the North-east monsoon (from October to December), with dominant northeast winds, and the Dry season (from January to May).

The cumulative rainfall for the Tamilnadu subdivision for the month of March 2023 was 34.3 mm against the normal of 19.9 mm which comes under Large Excess category (72%).
Source: IMD Chennai March 2023 Report.

4.2.2. Topography

Chennai is located on the south–eastern coast of India in the north–eastern part of Tamil Nadu on a flat coastal plain known as the Eastern Coastal Plains. Its average elevation is around 6.7 metres (22 ft), and its highest point is 60 m (200 ft). Chennai is 2,184 km (1,357 mi) south of Delhi, 1,337 km (831 mi) southeast of Mumbai, and 345 km (214 mi) east of Bangalore by road. Two major rivers flow through Chennai, the Cooum River (or Koovam) through the centre and the Adyar River to the south.

Adyar and Cooum rivers are heavily polluted with effluents and waste from domestic and commercial sources, the Coumm being so heavily polluted it is regarded as the city's eyesore. A protected estuary on the Adyar forms a natural habitat for several species of birds and animals. The Buckingham Canal, 4 km (2.5 mi) inland, runs parallel to the coast, linking the two rivers. The Otteri Nullah, an east–west stream, runs through north Chennai and meets the Buckingham Canal at Basin Bridge. Several lakes of varying size are located on the western fringes of the city. Some areas of the city have the problem of excess iron content in groundwater.
Source: website-topographic map

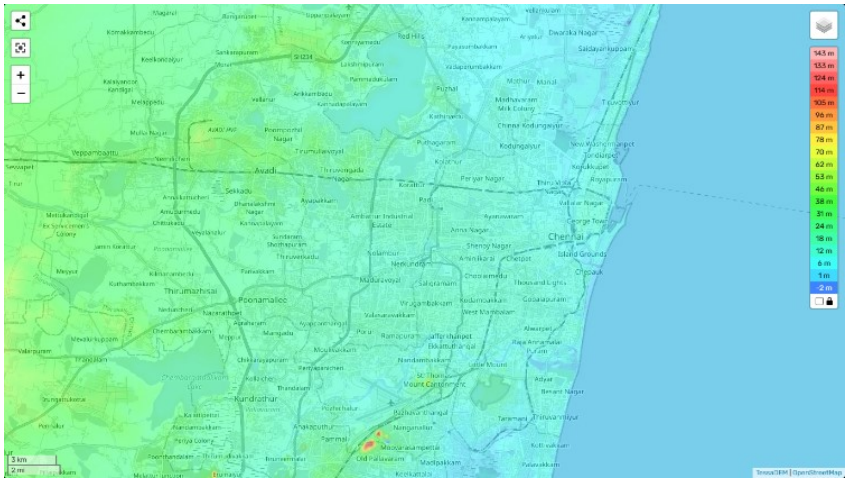


Figure 12:Topographical map of Greater Chennai Corporation

4.2.3. Geology

Chennai city and its agglomeration (Greater Chennai Corporation) are located in the Palar basin of East Coast of India. Palar basin is an intra cratonic pull apart rift basin occurring in the north eastern part of Tamil Nadu, bound by Chengalpattu basement ridge in the south and Pulicat ridge in the north. Chennai city is located at the centre of the Palar basin. The Palar basin is filled with thick upper Gondwana sediments resting on the basement charnockite and gneisses. Thus the geological formations of the Chennai area can be grouped into three units, namely (i) the Archaean/early Proterozoic crystalline rocks, (ii) Middle Jurassic to early Cretaceous, Gondwana sediments and (iii) the Quaternary (mostly Holocene to Recent) fluvio-marine deposits.

The thickness of Gondwana sediments vary from place to place in Chennai with thicknesses of 150 m in T. Nagar (southern side), 500 m in Koyambedu, 600 m in Oragadm, 750 m in Avadi and 2400 m in Arani (northern side).

Madhavaram milk colony, Manali, Tiruvottiyur, Agaram, Ayynavaram, Vallalar Nagar (Mint) have only fine to medium sand as substratum from ground level to 10 to 12 m depth. Mylapore, Koyambedu and Ramapuram areas have black clay at 10 m depth above which sand and clay is alternating up to surface level. Mogaper and Nungambakkam have clay and silty sand up to 6 m depth below which fine to medium sand is seen. Taramani and Velacherry areas have black marine clay (about 4 to 7 m thickness) above the crystalline bedrock occurring at shallow levels.
Source: JOUR.GEOL.SOC.INDIA, VOL.97, NOV. 2021 (Geology and Seismic Susceptibility of Chennai City – R. Srinivasan, Chennai).

4.2.4. Hydrology

The dug wells, filter point wells, tube wells and bore wells are the most common abstraction structures in the district. The dug wells are constructed in the alluvium as well as in hard rock areas in the city. The depth of the wells generally ranges between 10 and 15 m bgl and as shallow as 4 m bgl in Marina beach and the masonry structures are common. Some of the wells in coastal tract are tapping beach sands and are brick lined with cement plastering on the top 6 m. The deepening of structures with small diameter ring well inside the open well is commonly practiced.
Source: Central Ground Water Board, 2008, District Groundwater brochure Chennai district.

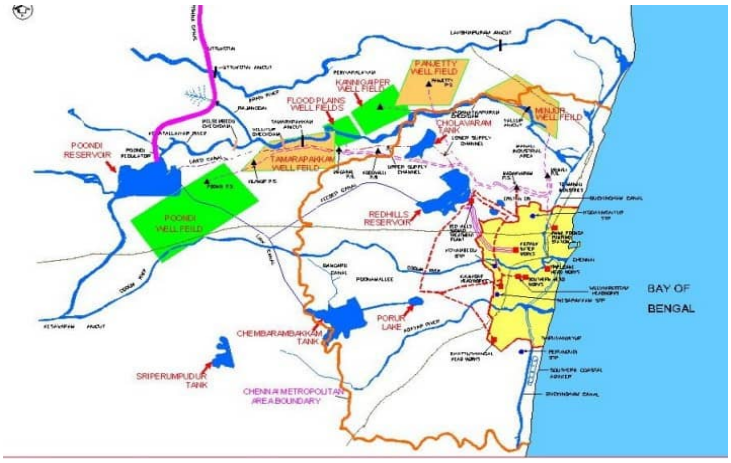


Figure 13:Hydrological map of Greater Chennai Corporation

4.2.5. Drainage

The Greater Chennai contains basin may be classified into three main regions, namely west and northwestern part of hilly region, central part as plain region and the eastern part parallel to the coast. In this basin, there are five estuaries, namely Pulicat Lake, Ennore estuary, Cooum estuary, Adayar estuary and Covelong estuary. Cooum estuary, part of which was used for navigation in earlier period now functioning as a sewage and drainage canal by the drains let into it, making it totally a polluted water body. The Buckingham canal formed along the coast had been used for navigation previously is also now become a sewage drain.

Figure 14:Drainage map of Greater Chennai Corporation

4.2.6. Forest

The Pallikaranai wetland and the Nanmangalam scrub forest. Located along the Tambaram-Velachery Main Road, the Nanmangalam Reserve Forest is among the last remaining havens of the 'Vandalur scrub', the original natural forest of this landscape.

Figure 15:Forest area map of Greater Chennai Corporation

4.3. Project Area (Puzhal & Kathirvedu (Left out streets), Mathur, Vadaperumbakkam, Theeyambakkam)

4.3.1 Climate

The climate here is tropical. In winter, there is much less rainfall than in summer. The Köppen-Geiger climate classification is Aw. In Project area, the average annual temperature is 28. °C. The rainfall here is around 993 mm per year.

Table 11: Climate Details of Greater Chennai

Year	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
2010	24.57	26.5	30.55	33.26	32.78	30.05	28.81	29.05	28.2	27.99	26.34	24.42
2011	24.15	25.81	29.33	31.74	32.33	32.23	29.79	29.12	28.5	28.08	25.63	24.37
2012	23.91	25.9	30.71	32.69	33.15	32.12	30.01	29.4	28.74	27.95	25.55	25.04
2013	25.15	27.12	29.85	33.58	33.2	29.94	29.14	28.89	28.05	27.58	26.01	24.65
2014	25.69	27.73	30.91	33.25	32.15	31.61	30.26	29.3	28.57	27.94	25.23	24.62
2015	24.37	26.5	30.7	31.69	31.33	30.72	31.7	29.55	29.06	28.36	26.27	24.85
2016	24.33	27.36	31.12	33.98	32.47	29.58	29.28	30.01	29.34	29.44	27.73	24.98
2017	25.58	26.96	31.52	33.77	34.06	31.64	30.44	28.75	28.04	27.67	26.07	24.4
2018	23.93	26.05	29.78	33.48	32.83	31.11	30.66	30.1	29.59	28.02	26.87	25.14
2019	24.65	28.79	31.88	33.75	33.48	32.62	30.19	28.76	27.76	27.45	26.85	25.25
2020	25.23	27.22	31.25	32.83	32.44	31.48	28.84	28.49	27.96	27.65	26.48	24.57
2021	24.71	24.75	29.03	32.4	32.54	31	28.97	28.82	28.13	27.9	26.28	24.77

Source: IMD Chennai 2023, (all the measurement are in degree Celsius)

4.3.2 Rainfall

The pre-monsoon rainfall is almost uniform throughout the project area. The project area is mainly depending on the seasonal rains, the distress conditions prevail in the event of the failure of rains. Northeast and Southwest monsoon are the major sources with 54% and 46% contribution each to the total annual rainfall.

4.3.3 Topography

Topography describes the shape and terrain of the land which provides details on the elevation and slope with reference to the mean sea level. Studying the terrain is important to manage the construction cost, minimize risks from natural hazards and minimize the impact of the proposed project on the environmental resources.The Mean Sea level of Puzhal 21m, Kathirvedu 11m, Mathur 9m, and Vadaperumbakkam & Theeyambakkam – 11m in Bay Of Bengal Sea.

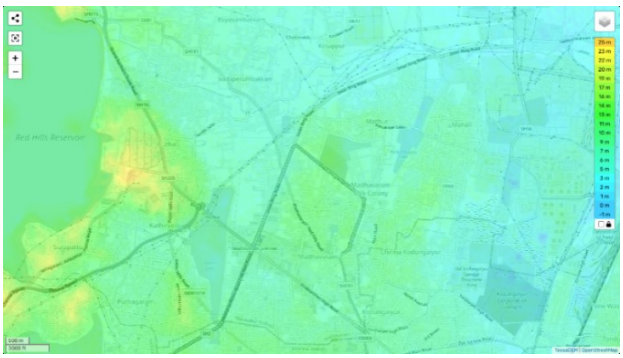


Figure 16:Topographical map of Project area

4.3.4 Relative Humidity

High relative humidity between 30 and 88 per cent prevail throughout the year. Relative humidity is maximum in the morning and minimum in the evening. Higher rates of relative humidity are observed between November and January

Table 12: Relative Humidity of Greater Chennai

Year	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
2010	80	75	67.25	66.31	66.69	71.75	74.06	76.12	79.19	80.5	86.38	83.19
2011	79.88	73.88	67.06	67.75	65.5	56.5	67.19	73.25	76.31	79.75	81.75	80.62
2012	78.38	72.81	68.12	65.69	60.44	57.06	67.81	70.31	75.38	79.12	80.62	81.44
2013	76.12	71.88	68.25	64.06	62.19	66.69	69.06	74.12	80.62	82.12	82.25	75.5
2014	71.94	66.56	60.19	62.69	68.38	64.5	64.69	71.69	77.38	80.62	81.12	82.56
2015	77.44	70.56	66.19	69	68.88	66.69	63.19	73.25	76.5	77.12	86.88	83.06
2016	76.06	73.12	66.31	64.81	66.81	71.62	72.75	70.25	72.25	68.25	69.5	76.5
2017	72.75	66.81	64.88	62.5	60.12	62.56	67.19	78.25	82.5	82.44	86.25	79.88
2018	76.06	71.88	66.88	64.12	66.69	63.94	63.62	66.56	74.12	77.69	78.56	80.25
2019	73.5	69.56	62.44	62	65.38	62.75	68.56	74.44	82.44	84.12	83	81.81
2020	78.06	69.38	62.88	65.81	69	65.38	78.25	80.06	81.38	81.31	84.5	82.12
2021	81.94	75	69.44	67.56	67.12	65.5	77.12	76.69	80.25	84	89.44	81.44

Source: IMD Chennai 2023, (all the measurement in percentage)

4.3.5 Cloud cover

Generally light clouds are observed in winter mornings. During pre-monsoon and the post-monsoon evenings the skies are either clear or lightly clouded. But in post-monsoon mornings as well as monsoon morning heavy clouds are commonly observed. And, the skies are light to moderately cloud in the evening time throughout the year.

4.3.6. Wind speed direction

The available data indicate the trend of wind speed direction during pre-monsoon, monsoon, post monsoon and winter season in a year, wind rose is given at Figure 15

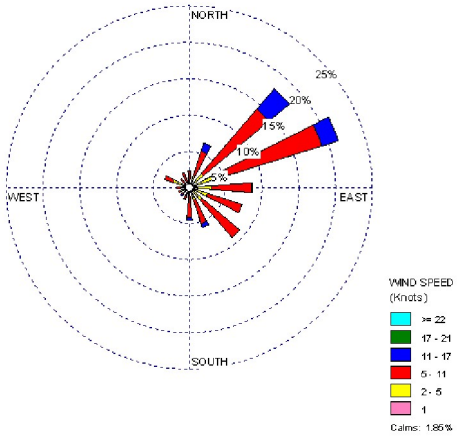


Figure 17:Windrose diagram of Greater Chennai Corporation

4.3.7 Hydrogeology

The Project Area is underlain by both sedimentary and fissured formations. The important aquifer system in the district is constituted by unconsolidated and semi-consolidated formations and weathered, fissured and fractured crystalline rocks. The hydrogeological study of the area is underlain by sedimentary and fissured formations. The important aquifer system is constituted by consolidated and semi consolidated formations of Granite, Gneisses, Charnokite and Sandstones, Conglomerate, Clay, Shale types of rocks. Ground water occurs under unconfined to semi confined and discontinuous, restricted to weathered residuum and fracture zones.

4.3.8 Ground water level

Tamil Nadu State Ground and Surface Water Resources Data Centre, WRD, Government of Tamil Nadu jointly with Central Ground Water Board (CGWB) determine the status of groundwater level for each tehsil every year and publish the findings once in four years after monitoring the important wells. The Ground Water Report, 2007 declared Project Area having 81% of long-term groundwater recharge as semi-critical area for future groundwater development.

4.3.9 Soil type

The soil analysis reveals that pH of the soil range between 8.31 to 8.76 which indicate that soil is moderately to strongly alkaline. The soil contains organic matter from 2.25% to 2.85%. The phosphorus is below detection limit and nitrogen is less in quantity.

4.3.10 Air quality

The ambient air quality monitoring was carried on 21-01-2023 at 12 locations on basis of wind direction and other metrological parameters.Samples are collected for 24 hours basis Once a week, and gaseous pollutants such as Sulphur dioxide (SO_2) and Nitrogen dioxide (NO_2). The Ambient Air Quality sampling locations of project areas comprise of Residential Category. The residential category includes residential and commercial buildings. The air quality monitoring results are interpreted as below:

Table 13: Ambient Air QualityMonitoring Stations

S.No	Location	Sample Code	Latitude and Longitude
1.	Gandhi Nagar, Mathur	AAQ - 1	13° 10' 7.2948" N80° 14' 17.5524" E
2.	Sakthi Nagar, Mathur	AAQ - 2	13° 10' 7.572" N80° 14' 26.6388" E
3.	Kamarar Nagar, Mathur	AAQ – 3	13° 10' 9.1092" N80° 14' 26.772" E
4.	Valluvar Nagar, Puzhal	AAQ – 4	13°9’15” N 80°11’50” E
5.	BharathiyarNagar, Puzhal	AAQ – 5	13°9’12” N 80°12’9” E
6.	Mettu Street, Puzhal	AAQ – 6	13° 9' 21.4632" N 80° 12' 28.9188" E
7.	Periyar Nagar, Theeyambakkam	AAQ - 7	13° 11' 32.9172'N 80° 14' 15.81"E
8.	Perumal Nagar, Theeyambakkam	AAQ - 8	13° 11' 43.7208"N 80° 14' 5.9028"E

9.	Rajiv Gandhi Nagar, Theeyambakkam.	AAQ – 9	13° 11' 53.1168"N80° 14' 6.8532" E
10.	Street no. 3, Kandasamy Nagar,Vadaperumbakkam	AAQ – 10	13° 10' 34.8132" N 80° 12' 55.4508"E
11.	Chettimedu Village, Vadaperumbakkam.	AAQ – 11	13° 11' 4.4088"N 80° 13' 25.338"E
12.	Annai Nagar, Vadaperumbakkam	AAQ - 12	13° 10' 33.9024'N80° 13' 33.0384" E

Table 14: Summary of Ambient Air Quality (µg/m3)

LOCATION	PM_{10},µg/m^3	$PM_{2.5}$,µg/m^3	SO_2,µg/m^3	NO_2,µg/m^3	CO, µg/m3
Gandhi Nagar, Mathur	56.1	19	5.18	11.3	BDL(DL:1.15)
Sakthi Nagar, Mathur	50.5	16.4	4.75	10.6	BDL(DL:1.15)
Kamaraj Nagar,	58.4	21.4	6.05	11.8	BDL(DL:1.15)
Valluvar Nagar, Puzhal	50.9	15.4	4.68	10.1	BDL(DL:1.15)
Bharathiyar Nagar, Puzhal	49.7	14.1	5.05	11.3	BDL(DL:1.15)
Mettu Street, Puzhal	51.6	15.9	4.84	10.4	BDL(DL:1.15)
Periyar Nagar, Theeyambakkam.	48.6	15.1	4.05	9	BDL(DL:1.15)
Perumal Kovil St	52.8	17	4.7	11.2	BDL(DL:1.15)
Rajiv Gandhi Nagar	50.3	16.2	4.94	11.6	BDL(DL:1.15)
St 3,Kandasamy Nagar, Vadaperumbakkam	52.4	16.1	4.05	9.6	BDL(DL:1.15)
Chettimedu Village, Vadaperumbakkam	57.6	19.6	5.45	12.3	BDL(DL:1.15)
Annai Nagar, Vadaperumbakkam	53.6	17.3	4.22	11	BDL(DL:1.15)
CPCBSTANDARD	**100**	**60**	**80**	**80**	**2**

All concentration of Pollutants are well within the available limits as per NAAQ standards.

Figure 18:Photos of Ambient Air Quality Monitoring

4.3.11 Noise Environment

The Ambient Noise quality monitoring was carried on 21-01-2023 at 12locations. The Results are as Follows

Table 15: Ambient Noise Monitoring Stations

S.No	Location	Sample Code	Latitude and Longitude
1.	Gandhi Nagar, Mathur	N-1	13° 10' 7.2948" N 80° 14' 17.5524" E
2.	Sakthi Nagar, Mathur	N-2	13° 10' 7.572" N 80° 14' 26.6388" E
3.	Kamarar Nagar, Mathur	N-3	13° 10' 9.1092" N 80° 14' 26.772" E
4.	Valluvar Nagar, Puzhal	N-4	13°9'15" N 80°11'50" E
5.	BharathiyarNagar,Puzhal	N-5	13°9'12" N 80°12'9" E
6.	Mettu Street, Puzhal	N-6	13° 9' 21.4632" N 80° 12' 28.9188" E
7.	Periyar Nagar, Theeyambakkam	N-7	13° 11' 32.9172'N 80° 14' 15.81"E
8.	Perumal Nagar, Theeyambakkam	N-8	13° 11' 43.7208"N 80° 14' 5.9028"E
9.	Rajiv Gandhi Nagar,	N-9	13° 11' 53.1168"N

	Theeyambakkam.		80° 14' 6.8532" E
10.	Street no. 3, Kandasamy Nagar, Vadaperumbakkam	N-10	13° 10' 34.8132" N 80° 12' 55.4508"E
11.	Chettimedu Village, Vadaperudmbakkam.	N-11	13° 11' 4.4088"N 80° 13' 25.338"E
12.	Annai Nagar, Vadaperumbakkam	N-12	13° 10' 33.9024'N 80° 13' 33.0384" E

Table 16: Summary of Ambient noise level measurement

S.No	Parameters	N-1	N-2	N-3	N-4	N-5	N-6	N-7	N-8	N-9	N-10	N-11	N-12
1	LDay {dB(A)}	58.1	61.4	57.4	55.8	52.8	57.3	51.2	53.5	58.1	59.3	57.1	62.4
2	LNight {dB(A)}	54.5	58.2	53.8	51.4	49.6	53.7	46.8	49.3	54.7	55.6	54.3	58.4
3	Avg {dB(A)}	56.05	59.75	55.6	53.6	51.2	55.55	49	51.4	56.4	57.45	55.7	60.4

The noise level survey conducted by the TNPCB reveals that noise level exceeded the limits mostly in commercial areas, mainly due to vehicular movement.

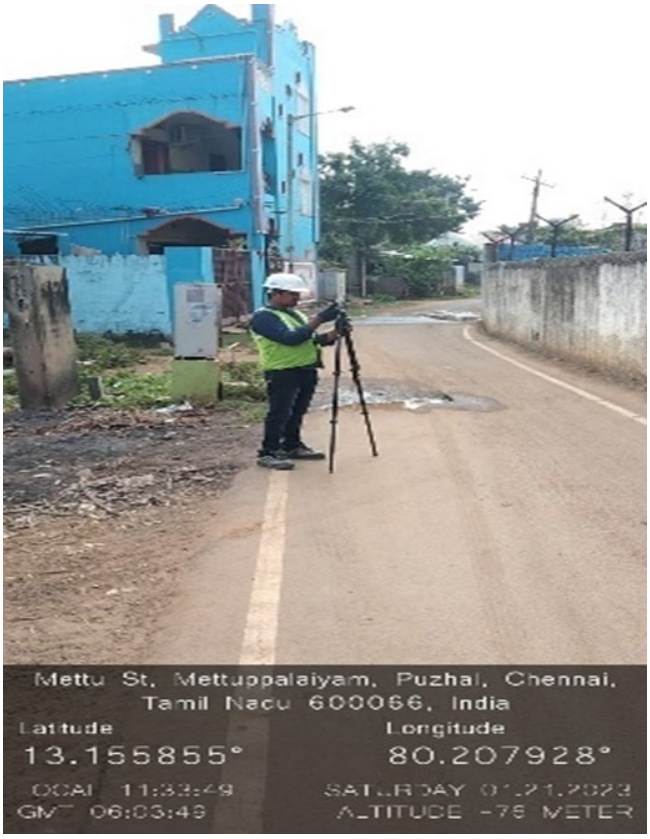


Figure 19:Photos of Ambient noise level measurement

4.3.12 Soil Quality monitoring

The Soil quality monitoring was carried on 21-01-2023 at 12locations.The Results are as Follows

Table 17: Soil Monitoring Stations

S.No	Location	Sample Code	Latitude and Longitude
1.	Gandhi Nagar, Mathur	S-1	13° 10' 7.2948" N 80° 14' 17.5524" E
2.	Sakthi Nagar, Mathur	S-2	13° 10' 7.572" N 80° 14' 26.6388" E
3.	Kamarar Nagar, Mathur	S-3	13° 10' 9.1092" N 80° 14' 26.772" E
4.	Valluvar Nagar, Puzhal	S-4	13°9'15" N 80°11'50" E
5.	BharathiyarNagar,Puzhal	S-5	13°9'12" N 80°12'9" E
6.	Mettu Street, Puzhal	S-6	13° 9' 21.4632" N 80° 12' 28.9188" E
7.	Periyar Nagar, Theeyambakkam	S-7	13° 11' 32.9172'N 80° 14' 15.81"E
8.	Perumal Nagar, Theeyambakkam	S-8	13° 11' 43.7208"N 80° 14' 5.9028"E
9.	Rajiv Gandhi Nagar, Theeyambakkam.	S-9	13° 11' 53.1168"N 80° 14' 6.8532" E
10.	Street no. 3, Kandasamy Nagar, Vadaperumbakkam	S-10	13° 10' 34.8132" N 80° 12' 55.4508"E
11.	Chettimedu Village, Vadaperumbakkam.	S-11	13° 11' 4.4088"N 80° 13' 25.338"E
12.	Annai Nagar, Vadaperumbakkam	S-12	13° 10' 33.9024'N 80° 13' 33.0384" E

Table 18: Summary of Soil Environment

S.No	Parameters	Test Method	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	S-10	S-11	S-12
1	pH @ 25°C	IS 2720 Part -26	8.67	8.86	8.74	8.62	8.73	8.8	8.67	8.86	8.74	8.76	8.7	8.83
2	Electrical ConductivitymS/cm	IS 14767 (2000)	316	364	422	376	405	342	316	364	422	428	350	394
3	Total Kjheldal Nitrogen as N, %	IS 14684	0.018	0.021	0.017	0.016	0.02	0.022	0.018	0.021	0.017	0.021	0.025	0.024
4	Total Phosphorus as P, meq /100g	IS 10158	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL(<0.1)	BDL (<0.1)	BDL (<0.1)
5	Soluble Potassium as K, meq /100g	FAO Chapter 3	0.98	1.04	1.05	1.02	1	0.98	0.98	1.04	1.05	1.01	1	1.02
6	Exchangeable Calcium, meq/100g	FAO Chapter 3	7.5	8.6	6.9	8.4	7.6	7.9	7.5	8.6	6.9	7.2	6.6	6.4
7	Exchangeable Magnesium, meq /100g	FAO Chapter 3	3.9	4.5	3.3	4.8	4.5	4.1	3.9	4.5	3.3	3.8	3.2	3.5
8	Exchangeable Sodium, meq /100g	FAO Chapter 3	1.8	1.82	1.76	1.65	1.57	1.62	1.8	1.82	1.76	1.84	1.78	1.71
9	Organic Matter, %	2720 Part - 22	1.2	1.18	1.17	1.06	1.21	1.14	1.2	1.18	1.17	0.98	1.14	1.04

10	**Texture Classification**	Robison Pipette Method	**Sandy**	**Sandy**	**Sandy**	**Sandy**	**Sandy**	**Sandy**	**Sandy**	**Sandy**	**Sandy**	**Sandy**	**Sandy**	**Sandy**
11	**Sand, %**		**60.9**	**63.4**	**61.4**	**52.8**	**56**	**50.9**	**60.9**	**63.4**	**61.4**	**63.9**	**65.1**	**61.9**
12	**Clay, %**		**24**	**18.9**	**19.1**	**20.6**	**23.1**	**24**	**24**	**18.9**	**19.1**	**15.2**	**22.2**	**24.4**
13	**Slit, %**		**15.1**	**17.7**	**19.5**	**26.6**	**20.9**	**25.1**	**15.1**	**17.7**	**19.5**	**15.9**	**12.7**	**13.7**

All the soil parameters are falling within the concentration limits of compost in SWM Rules,2016 and Hazardous waste (management & handling) Rule, 1989 and its amendments.

Figure 20:Photos of Soil sampling

4.3.13 Ground water quality

The Ground Water quality monitoring was carried on 21-01-2023 at 12locations.The Results are as Follows

Table 19: The Ground Water Monitoring Stations

S.No	Location	Sample Code	Latitude and Longitude
1.	Gandhi Nagar, Mathur	N-1	13° 10' 7.2948" N 80° 14' 17.5524" E
2.	Sakthi Nagar, Mathur	N-2	13° 10' 7.572" N 80° 14' 26.6388" E
3.	Kamarar Nagar, Mathur	N-3	13° 10' 9.1092" N 80° 14' 26.772" E
4.	Valluvar Nagar, Puzhal	N-4	13°9'15" N 80°11'50" E
5.	BharathiyarNagar, Puzhal	N-5	13°9'12" N 80°12'9" E
6.	Mettu Street, Puzhal	N-6	13° 9' 21.4632" N 80° 12' 28.9188" E
7.	Periyar Nagar, Theeyambakkam	N-7	13° 11' 32.9172'N 80° 14' 15.81"E
8.	Perumal Nagar, Theeyambakkam	N-8	13° 11' 43.7208"N 80° 14' 5.9028"E
9.	Rajiv Gandhi Nagar, Theeyambakkam.	N-9	13° 11' 53.1168"N 80° 14' 6.8532" E
10.	Street no. 3, Kandasamy Nagar, Vadaperumbakkam	N-10	13° 10' 34.8132" N 80° 12' 55.4508"E
11.	Chettimedu Village, Vadaperumbakkam.	N-11	13° 11' 4.4088"N 80° 13' 25.338"E
12.	Annai Nagar, Vadaperumbakkam	N-12	13° 10' 33.9024'N 80° 13' 33.0384" E

Table 20: Summary of Ground Water Sample Analysis

S.No.	PARAMETERS	UNIT	TEST METHOD	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6	GW-7	GW-8	GW-9	GW-10	GW-11	GW-12	PERMISSIBLE LIMIT AS PER IS10500-2012
1	pH @ 25°C	--	IS 3025-Part 11	7.68	7.42	7.31	6.59	7.61	6.94	7.36	7.05	6.94	6.59	7.61	6.94	6.5-8.5
2	Iron as Fe	mg/l	IS 3025-Part 53	0.16	0.06	0.08	0.11	0.09	0.13	0.16	0.12	0.08	0.11	0.09	0.13	0.3
3	Chlorine Residual	mg/l	IS 3025-Part 26	BDL (<0.2)	BDL (<0.2)	BDL (<0.2)	BDL (<0.2)	BDL (<0.2)	BDL (<0.2)	BDL (<0.2)	BDL (<0.2)	BDL (<0.2)	BDL (<0.2)	BDL (<0.2)	BDL (<0.2)	1.0
4	Total Chromium	mg/l	IS 3025-Part 52	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	--
5	Hexavalent Chromium Cr6+	mg/l	IS 3025-Part 52	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	BDL (<0.5)	--
6	Total Dissolved Solids (TDS)	mg/l	IS 3025-Part 16	520	486	628	810	1140	726	490	420	476	740	480	410	2000
7	Total Suspended solids (TSS)	mg/l	IS 3025 part-17	BDL (<1.0)	BDL (<1.0)	BDL (<1.0)	2.0	BDL (<1.0)	BDL (<1.0)	2.0	BDL (<1.0)	BDL (<1.0)	2.0	BDL (<1.0)	BDL (<1.0)	--
8	Chemical Oxygen Demand	mg/l	IS 3025-part 58	BDL (<4.0)	BDL (<4.0)	BDL (<4.0)	BDL (<4.0)	BDL (<4.0)	BDL (<4.0)	BDL (<4.0)	BDL (<4.0)	BDL (<4.0)	BDL (<4.0)	BDL (<4.0)	BDL (<4.0)	--
9	BOD @27°C for 3 days	mg/l	IS 3025-Part 44	BDL (<2.0)	BDL (<2.0)	BDL (<2.0)	BDL (<2.0)	BDL (<2.0)	BDL (<2.0)	BDL (<2.0)	BDL (<2.0)	BDL(<2.0)	BDL(<2.0)	BDL(<2.0)	BDL(<2.0)	--
10	Calcium as Ca	mg/l	IS 3025-Part 40	40	36	49	49	62	51	44	36.8	40	80	38.0	29	200

11	Cyanide	mg/l	APHA-23rd Edn:2017	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	0.05
12	Cadmium	mg/l	APHA-23rd Edn:2017	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	0.003
13	Nickel	mg/l	IS 3025 Part 53	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	0.02
14	Copper	mg/l	IS 3025 Part 42	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	1.5
15	Lead	mg/l	IS 3025 Part 47	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	0.01
16	Zinc	mg/l	IS 3025-Part 49	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	BDL(<0.5)	15
17	Total Phosphorous as PO4	mg/l	IS 3025 Part 31	0.38	0.34	0.58	0.72	0.91	0.64	0.68	0.83	0.72	0.91	0.57	0.68	--	
18	Total Kjeldhal Nitrogen (TKN)	mg/l	IS 3025-Part 34	BDL(<1.0)	BDL (<1.0)	BDL (<1.0)	BDL (<1.0)	BDL (<1.0)	BDL (<1.0)	BDL (<1.0)	BDL (<1.0)	BDL (<1.0)	BDL (<1.0)	BDL (<1.0)	BDL (<1.0)	BDL (<1.0)	--
19	Ammonia as NH3	mg/l	IS 3025-Part 34	BDL(<0.1)	BDL(<0.1)	BDL(<0.1)	BDL(<0.1)	0.16	BDL(<0.1)	BDL(<0.1)	0.16	BDL(<0.1)	BDL(<0.1)	0.16	BDL(<0.1)	--	
20	Dissolved Oxygen	mg/l	IS 3025-Part 38	7.2	7.4	7.1	6.9	7.0	7.0	6.9	7.0	7.0	6.9	7.0	7.0	--	
21	Chloride as Cl	mg/l	IS 3025-Part 32	196	180	212	262	384	240	160	142	164	232	142	102	1000	
22	Sulphate as SO4	mg/l	APHA-23rd Edn:2017	30	27	36	46.0	72.0	41	45	32	49	46.0	72.0	41	400	

23	Total Hardness as CaCO3	mg /l	IS 3025-Part 21	212	200	262	290	348	272	208	172	186	240	158	172	600
24	Total Alkalinity as CaCO3	mg /l	IS 3025 part-23	184	162	230	282	316	250	192	160	170	202	116	142	600

The baseline status of ground water quality has been established through sampling and analysis of various water quality parameters as part of the environmental monitoring conducted by the Consultants. At eight locations water samples were collected and analyzed for various parameters. The sampling locations were selected based on existing land use and nature of water sensitive locations. Water quality results were compared with BIS water quality standards.

The values of pH in the water samples collected from study area ranges from 7.25 to 7.46 for ground water. The observed values of pH are within permissible limits of BIS 10500.The values of Turbidity for ground water samples are within permissible limit which ranges from 1-3 NTU.Total alkalinity for all ground water samples is found within permissible limit. The observations is concluded that most of the parameters are above acceptable limit of BIS 10500:2012 standards. Hence ground water is not suitable for drinking purpose.

Figure 21:Photos of Ground Water Sample Collection

4.3.14. Surface Water Quality

The Surface Water quality monitoring was carried on 21-01-2023 at 4locations.The Results are as Follows.

Table 21: The Surface Water Monitoring Stations

S.No	Location	Sample Code	Latitude and Longitude
1.	Omakulam Lake, Mathur	SW-1	13° 10' 11.424'' N 80° 14' 28.356'' E
2.	Puzhal lake	SW-2	13°09'35.8"N 80°11'07.7"E
3.	Ariyalur Pond	SW-3	13° 11' 33.396'' N 80° 14' 41.136'' E
4.	Vadaperumbakkam Pond	SW-4	13° 10' 34.032'' N 80° 12' 53.352'' E

Table 22: Summary of Surface Water Sample Analysis

S. No.	PARAMETERS	UNIT	TEST METHOD	Result for SW-1	Result for SW-2	Result for SW-3	Result for SW-4	PERMISSIBLE LIMIT AS PER IS 10500-2012
1	Taste	--	IS3025-Part5	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
2	Odour	--	IS3025-Part5	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	Colour	Hazen	IS3025-Part4	15	15	20.0	10	15
4	Turbidity	NTU	IS 3025-Part10	10.6	10.6	7.61	7.26	5.0
5	pH@ 25°C	--	IS3025-Part11	7.39	7.39	893	561	6.5-8.5
6	Conductivity@ 25°C	uS/cm	IS 3025-Part14	730	730	6.9	6.8	--
7	Dissolved Oxygen	mg/l	IS3025-Part44	6.9	6.9	BDL (DL:2.0)	BDL (DL:2.0)	--
8	BOD@27°C for3 days	mg/l	IS3025-Part44	BDL (<2.0)	BDL (<2.0)	482	292	--
9	Total Dissolved Solids (TDS)	mg/l	IS3025-Part16	460	460	BDL (DL:1.0)	BDL (DL:1.0)	2000
10	Total Suspended Solids (TSS)	mg/l	IS3025-Part17	42	42	BDL (DL:1.0)	BDL (DL:1.0)	200
11	Total Alkalinity as $CaCO_3$	mg/l	IS 3025-Part 23	84	84	148	114	600
12	Total Hardness as	mg/l	IS 3025-Part 23	94.0	94.0	130	88.0	600

	$CaCO_3$							
13	Chloride as Cl	mg/l	IS 3025-Part 32	72	72	37.0	22.0	1000
14	Sulphate as SO_4	mg/l	APHA-23rd Edn-2017	22.0	22.0	2.28	1.70	400
15	Nitrate as NO_3	mg/l	APHA-23rd Edn-2017	1.72	1.72	BDL (DL:1.0)	BDL (DL:1.0)	45
16	Ammonia as N	mg/l	APHA-23rd Edn-2017	0.12	0.12	0.24	0.16	0.5
17	Fluorides as F	mg/l	APHA-23rd Edn-2017	0.23	0.23	0.29	0.31	1.0
18	Calcium as Ca	mg/l	IS 3025-Part 40	20	20	30.0	25.2	200
19	Magnesium as Mg	mg/l	IS 3025-Part 46	10.6	10.6	17.5	12.2	100
20	Potassium as K	mg/l	IS 3025-Part 45	7	7	BDL (DL:0.2)	BDL (DL:0.2)	--
21	Barium as Ba	mg/l	IS 3025-Part 24	BDL (<0.01)	BDL (<0.01)	0.24	0.16	0.7
22	Aluminium as Al	mg/l	APHA-23rd Edn-2017	BDL (<0.1)	BDL (<0.1)	BDL (DL:0.5)	BDL (DL:0.5)	0.2
23	Cadmium as Cd	mg/l	IS 3025-Part 41	BDL (<0.01)	BDL (<0.01)	BDL (DL:0.1)	BDL (DL:0.1)	--
24	Zinc as Zn	mg/l	IS 3025-Part 49	BDL (<0.05)	BDL (<0.05)	BDL(DL:0.1)	BDL(DL:0.1)	5.0
25	Selenium as Sc	mg/l	APHA-23rd Edn-2017	BDL (<0.01)	BDL (<0.01)	BDL (DL:0.1)	BDL (DL:0.1)	0.01
26	Arsenic as As	mg/l	IS 3025-Part 37	BDL (<0.05)	BDL (<0.05)	48.1	46.8	--
27	Mercury as Hg	mg/l	IS 3025-Part 48	BDL (<0.01)	BDL (<0.01)	1.24	1.05	--
28	Cyanide (as CN)	mg/l	APHA-23rd Edn-2017	BDL (<0.05)	BDL (<0.05)	120	50	0.05
29	Phenolic Compounds (as C6H5OH)	mg/l	IS 3025-Part 43	BDL (<0.01)	BDL (<0.01)	Agreeable	Agreeable	0.001
30	Anionic Surfactants as MBAS	mg/l	APHA-23rd Edn-2017	BDL (<0.05)	BDL (<0.05)	Agreeable	Agreeable	1.0
31	Pesticides		APHA-23rd Edn-2017	Absent	Absent	20.0	10	Absent
32	Copper	mg/l	IS 3025-Part 42	BDL (<0.01)	BDL (<0.01)	7.61	7.26	0.05
33	Iron as Fe	mg/l	IS 3025-Part 53	BDL(<0.01)	BDL(<0.01)	893	561	0.3
34	Manganese as Mn	mg/l	IS 3025-Part 59	BDL (<0.5)	BDL (<0.5)	6.9	6.8	0.3
35	Boron as B	mg/l	IS 3025-Part 57	BDL (<0.05)	BDL (<0.05)	BDL(DL:2.0)	BDL(DL:2.0)	1.0
36	Lead as Pb	mg/l	IS 3025-Part 47	BDL (<0.01)	BDL (<0.01)	482	292	--
37	Chromium Cr6+	mg/l	IS 3025-Part 52	BDL (<0.1)	BDL (<0.1)	BDL(DL:1.0)	BDL(DL:1.0)	--
38	Total Coliforms	MPN/100ml	IS 1622:1981	80	80	BDL(DL:1.0)	BDL(DL:1.0)	Absent/100ml
39	E.coli	MPN/100ml	IS 1622:1981	50	50	148	114	Absent/100ml

The values of pH in the water samples collected from study area ranges from 6.26 to 7.41 for surface water.Calcium concentration is varying between 52-672 mg/l for surface water samples. For surface water samples at all location concentration of Magnesium is not above the permissible limit. Faecal coliform is high in Surface water. Presence of coliform in all samples shows contamination of water in region.

4.4 Noise Sensitive Receptors

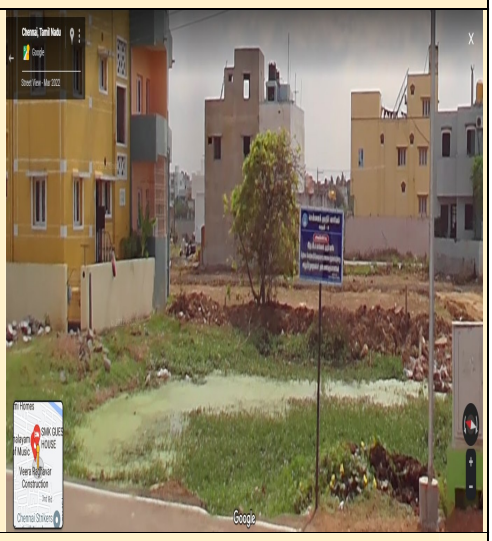
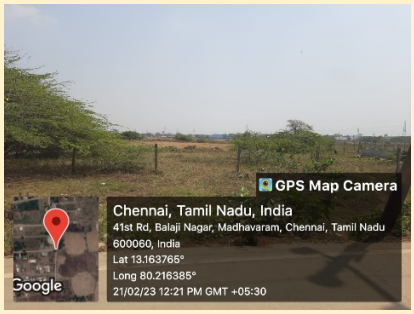
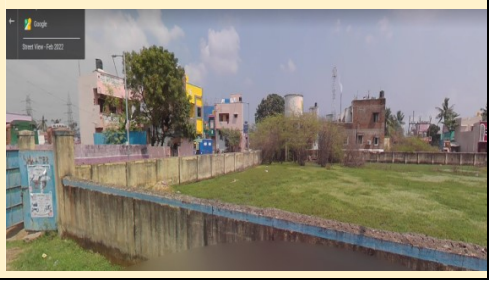
The receptor of noise will be close to the construction site areas, offices, religious structures, market area and other public areas for which special mitigation measures will be taken care of during construction phase by providing proper noise barrier / acoustic and other sources close to the sensitive noise receptors.

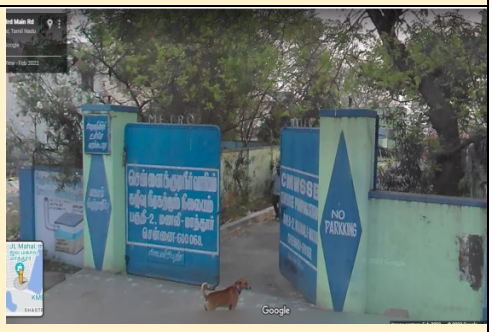
4.5 Site specific Environmental features

Table 23: Site Specific Environmental Features

Sl. No	Infrastructure	SPS/LS	Location and Environmental Feature	Site Photograph
1.	Sub Pumping Station	VDP/SPS-01	**Samuel Nagar Burial ground** - This sub pumping station is proposed at burial ground, Vadaperumbakkam belongs to GCC. No trees are present within the site. The odour control mechanism, compound wall on all the four sides, planting creepers, tree plantation provisions are proposed.	
2.	Sub Pumping Station	VDP/SPS-02	**Perumal Koil Street** – This sub pumping station is proposed near Perumal temple in Vadaperumbakkam. No tree is present in the site. The SPS site is surrounded by Residential buildings on one side and Greater Chennai Corporation Park on the other side with the road access from Vadaperumbakkam Main Road & Puzhal Union Road. The odour control mechanism, compound wall on all the four sides, planting creepers and tree plantation provisions are proposed.	

3.	Sub Pumping Station	CTM/SPS-01	**Mariamman Koil Street** - This sub pumping station is proposed near GCC solid waste segregation site in Chettimedu. No tree is present in the site. The odour control mechanism, compound wall on all the four sides, planting creepers and tree plantation provisions are proposed.	
4.	Sub Pumping Station	KSP/SPS-01	**Manali Kosappur Road** - Existing OHT has been proposed to be dismantled after commissioning of the ongoing comprehensive WSS in Vadaperumbakkam-Theeyambakkam. No tree is present within the site. The SPS site is surrounded by Residential buildings.The odour controlmechanism, compound wall on all the four sides, planting creepers and tree plantation provisions are proposed.	
5.	Sub Pumping Station	PZ/SPS-01	**Kannappa Swamy Nagar 26th Street** - Existing OHT has been proposed to be dismantled after commissioning of the ongoing comprehensive WSS in Puzhal. No tree is present within the site. The SPS site is surrounded by Residential buildings.The odour controlmechanism, compound wall on all the four sides, planting creepers and tree plantation provisions are	

			proposed.	
6.	Sub Pumping Station	PZ/SPS-02	**Dhanalakshmi Nagar 2nd Street** - This proposed sub pumping station is surrounded by residential buildings. The odour controlmechanism, compound wall on all the four sides, planting creepers and tree plantation provisions are proposed.	
7.	Sub Pumping Station	PZ/SPS-03	**Balaji Nagar 3rd Main Road** – The SPS site is located in the habituated area surrounded by Residential buildings & vacant land on another side. The odour controlmechanism, compound wall on all the four sides, planting creepers and tree plantation provisions are proposed.	
8.	Sub Pumping Station	MT/SPS-01	**Manali – Kosappur Road** - The pumping station site is located in the habituated area surrounded by Residential buildings. No tree is present within the site. The odour control mechanism, compound wall on all the four sides, planting creepers and tree plantation provisions are proposed.	
9.	Sub Pumping Station	MT/SPS-02	**Bharathi Nagar 3rd Street** - The SPS site is located in the habituated area surrounded by Residential buildings with road access from Kamarajar Salai & Manali Express Highway. No tree is present within the site. The odour controlmechanism,	

			compound wall on all the four sides, planting creepers and tree plantation provisions are proposed.	
10.	Sub Pumping Station	MT/SPS-03	**MMDA 3rd Main Road** - The existing sewage pumping station is located in the habituated area surronded by residential buildings with road access from Kamarajar Salai. Dismantling of existing well structure is envisaged but may be decided during implementation. No tree is present within the site. The odour controlmechanism, compound wall on all the four sides, planting creepers and tree plantation provisions are proposed.	
11.	Lift Station	ARY/LS-02	**Perumal Koil Street, Periyar Nagar** – Existing site of borewell Filter bed without any trees. This site is surrounded by Residential buildings & vast vacant areas with road access from Andarkuppam Kosappur Road. The compound wall on all the four sides planting creepers and tree plantation provisions are proposed.	
12.	Lift Station	VDP/LS-01	**Madhavaram Redhills Road** - Existing CMWSSB OHT site without any trees. This site is located in the habituated area surrounded by Residential buildings on both sides, road access from Madhavaram Redhills State Highway. The compound wall on all the four sides are proposed.	

13.	Lift Stations	ARY/LS-01 TY/LS-01 VDP/LS-02 KSP/LS-01 MT/LS-01 KTV/LS-01 PZ/LS-01 PZ/LS-02 PZ/LS-03	In addition to the 10 sewage pumping stations& 2 lift stations proposed in available sites, 9 nos. of lift stations are proposed on road side, Diameter of road side lift stations are restricted to 2.5mts Lift station has been proposed as buried below the road surface, provided with two sewage submersible pumps to lift sewage and pump to nearest higher Machine holes/lift stations. A kiosk with panel will be erected at the side of road for pumps operation.	
14.	Collection system		Collection gravity system is the pipeline network that receives the sewage from the house service connections and conveys to the pumping station. Machine holes will be constructed at the centre of the road and Pipelines will be laid connecting the Machine Holes, for the roads wider than 60ft rider mains have been proposed to avoid frequent crossings.	
15.	Pumping mains		Pumping mains of varying diameter have been proposed to convey the sewage collected at the lift stations or pumping stations to the network of next zone or to the STP through CI pipelines. Pumping mains will be laid on shoulder / footpaths of the roads. Care has been taken considering the available widths while selecting the alignment of roads.	
16.	Pipe Carrying Bridge		It is proposed to construct pipe carrying bridge across Kosasthaliyar River for a length of 150mm for disposal of ewage from KSP/SPS-01 to Suction well in Mathur-MT/SPS-01. Necessary permission/clearance from	

			PWD will be obtained before execution of work.	

All the above sites except the site for PZ/SPS-02 (Puzhal) are free from encumbrances and owned by Government agencies/departments. The land records are provided in Annexure 3.No Objection for constructing pumping stations on Roadside are already obtained and letter received from Greater Chennai Corporation (GCC) is provided in Annexure 3.The pumping main will be laid within the Right of Way of the roads belongs to Greater Chennai Corporation, State Highways and National Highway.

4.6 Socio-economic profile of Project Area

The female work participation out of total female population was 23.46 % in the district in 2011. The female participation rate varies among the blocks ranging from 15.51 % in Puzhal to 44.70 % in Tiruvalangadu.In primary sector the proportion of workers employed had declined from 22.4 % in 2001 to 21.4% in 2011 the overall worker population had increased by 55.8 %; yet the number of cultivators reduced by 5.5% and net sown area reduced by 10.46%.The majority of people work in daily wages.

4.6.1 Connectivity

The private and public transportation by roadway the way to connect the other area to Puzhal. The Chennai bus route no 157M operated by MTC, Chennai.Mathur, Vadaperumbakkam, Theeyambakkam area connected with NH and SH Roads.

Chennai city bus route no 58A operated by MTC (Metropolitan Transport Corporation, Chennai). MTC is the company that operates the public bus service in Chennai and runs multiple number of city buses between Redhills Bus Terminus and Broadway everyday.

4.6.2 Economy

Economy of sub -Project Areain Greater Chennai Corporation is largely dependent on industrial work. About 50% of the total work forces of this district are engaged in the industrial sector.

4.6.3 Social Structure

Puzhal is a Town Panchayat city in district of Thiruvallur, Tamil Nadu. The Puzhal city is divided into 18 wards for which elections are held every 5 years. The Puzhal Town Panchayat has population of 31,665 of which 16,810 are males while 14,855 are females as per report released by Census India 2011.Population of Children with age of 0-6 is 3363 which is 10.62 % of total population of Puzhal (TP). In Puzhal Town Panchayat, Female Sex Ratio is of 884 against state average of 996. Moreover Child Sex Ratio in Puzhal is around 910 compared to Tamil Nadu state average of 943. Literacy rate of Puzhal city is 88.90 % higher than state average of 80.09 %. In Puzhal, Male literacy is around 91.24 % while female literacy rate is 86.24 %. Puzhal (TP) of Thiruvallur has substantial population of Schedule Caste. Schedule Caste (SC) constitutes 33.72 % while Schedule Tribe (ST) were 0.17 % of total population in Puzhal (TP).

Mathur is a Census Town city in district of Thiruvallur, Tamil Nadu. The Mathur Census Town has population of 27,674 of which 14,081 are males while 13,593 are females as per report released by Census India 2011.Population of Children with age of 0-6 is 2980 which is 10.77 % of total population of Mathur (CT). In Mathur Census Town, Female Sex Ratio is of 965 against

state average of 996. Moreover Child Sex Ratio in Mathur is around 854 compared to Tamil Nadu state average of 943. Literacy rate of Mathur city is 90.12 % higher than state average of 80.09 %. In Mathur, Male literacy is around 94.72 % while female literacy rate is 85.43 %.Schedule Caste (SC) constitutes 16.57 % while Schedule Tribe (ST) were 0.13 % of total population in Mathur (CT).

In Vadaperumbakkam village, The Total Polutation as per 2011 census of India 1682.In Male and Female Population 859 and 853.Most of the villagers are from Schedule Caste (SC). Schedule Caste (SC) constitutes (1280 persons)76.10 % while Schedule Tribe (ST) were (1 person) 0.06 % of total population in Vadaperumbakkam village.

4.6.4 Literacy Level

Literacy rate of is 88.90% higher than state average of 80.09%. In Project area, male literacy is around 91.24% while female literacy rate is 86.24%.

4.6.5 Occupational pattern

Out of total population, 12,899 were engaged in work or business activity. Of this 9,810 were males while 3,089 were females. In census survey, worker is defined as person who does business, job, service, and cultivator and labour activity. Of total 12899 working population, 79.22 % were engaged in Main Work while 20.78 % of totalworkers were engaged in Marginal Work.

In Vadaperumbakkam village out of total population, 586 were engaged in work activities. 73.72 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 26.28 % were involved in Marginal activity providing livelihood for less than 6 months. Of 586 workers engaged in Main Work, 13 were cultivators (owner or co-owner) while 12 were Agricultural laborer.

Out of total population, 10,160 were engaged in work or business activity. Of this 8,369 were males while 1,791 were females. In census survey, worker is defined as person who does business, job, service, and cultivator and labour activity. Of total 10160 working population, 79.83 % were engaged in Main Work while 20.17 % of total workers were engaged in Marginal Work.

CHAPTER-5 Potential Environmental and Social Impacts and Mitigation Measures

This section identifies and assesses the potential changes in the environmentand social aspects that could be expected from the proposed project. The impacts have been predicted for the proposed activities assuming that the impact due to the existing activities has already been covered under base line environmental monitoring and continue to remains same till the operation of the project. The proposed project activities would create impact on the environment in two distinct phases i.e., construction and operation phases. Impacts are identified, predicted and evaluated based on the analysis of the information collected from following

- Project information (as discussed in Chapter-2) and
- Baseline information and site visits of the study area (as discussed in Chapter-4)

This section also describes mitigation measures, which have been suggested for the adverse impacts likely to be caused due to activities of both construction and operation phases of the project. The identification of likely impacts during construction and operational phases of the proposed project has been done based on likely activities having their impact on one or another environmental parameters. The details of the activities and their impacts have been worked out in the following sections.

5.1 Identification of likely impacts

Every activity and operation has either adverse or beneficial impacts on the environment. The environmental and social impact identification has been done based on proposed project activities. Potential environmental and socialimpacts of the proposed infrastructure components are presented in this section. Mitigation measures to minimize / mitigate negative impacts, if any, are recommended along with the agency responsible for implementation. Monitoring actions to be conducted during the implementation phase is also recommended to reduce the impact.

Screening of potential environmental and social impacts are categorized into four categories considering subproject phases: location impacts and design impacts (pre-construction phase), construction phase impacts and operations and maintenance phase impacts.

(i) Location impacts include impacts associated with site selection and includeloss of on-site biophysical array and encroachment either directly or indirectly onadjacent environments. It also includes impacts on people who will lose theirlivelihood or any other structures by the development of that site.

(ii) Design impacts include impacts arising from Investment Program designincluding technology used, scale of operation/throughput, waste production, discharge specifications, pollution sources and ancillary services.

(iii) Construction impacts include impacts caused by site clearing, earthworks,machinery, vehicles, workers, occupational health and safety. Construction site impacts include erosion, dust,noise, traffic congestion and waste production.

(iv) O&M impacts include impacts arising from the operation and maintenanceactivities of the infrastructure facility. These include routine management ofoperational waste streams, and occupational health and safety issues.

This section of the ESIA reviews possible project-related impacts, in order to identify Issues requiring further attention and screen out issues of no relevance. The Environmental and Social Screening formats are provided in the Annexure 1

In the case of this project most of the individual elements involve simple construction and operation, so impacts will be mainly localized and not greatly significant negative impacts associated with sewage facilities such as odour are already considered in the design and siting, most of the predicted impacts are associated with the construction process, and are produced because that process is invasive, involving excavation and earth movements; and being mostly located in an urban area, will not cause direct impact on biodiversity values.

The project will be in properties held by the local government and access to the project location is through public rights-of-way and existing roads hence, land acquisition and encroachment on private property will not occur.

5.1.1 Design & Location impacts

Sewer system – collection and conveyance

The sewerage system is designed as a separate system of sewage collection (i.e. caters only to wastewater). Existing surface road side drains in the project area cater to collection and conveyance of runoff during rains. The underground gravity sewers will carry sewage from households to the nearest lifting or pumping station, onwards to next sewer zone or to terminal sewage pumping station from where the sewage is pumped to the existing STP.

Sewer system will cater to domestic wastewater - grey water (from kitchen and bath areas) plus black water (toilet waste/excreta), and every household outlet carrying the wastewater will be connected to the sewer network. To maximize the benefits as intended, CMWSSB will ensure that all existing septic tanks are phased out by bypassing the inlet and connecting the toilet discharge from each house directly to sewerage system.

Accumulation of silt in sewers in areas of low over time, overflows, blockages, power outages, harmful working conditions for the workers cleaning sewers etc. are some of the issues that are taken into consideration during the sewer system design. Measures such as the following are included in sewer system design to ensure that the system provides the benefits as intended:

- Limit the sewer depth to 4.5mts, so that O&M of the system will be easy.
- Sewers shall be laid away from water supply lines and drains (at least 1 m), if not possible, sewer lines shall be laid below the water lines.
- In all cases, the sewer line should be laid deeper than the water pipeline (the difference between top of the sewer and bottom of water pipeline should be at least 300 mm);
- In unavoidable cases, where sewers are to be laid close to storm water drains, appropriate pipe material (that has no or least infiltration risk) shall be selected (DWC &CI pipes adopted)

- For shallower sewers and especially in narrow roads, wherever possible use small inspection chambers in lieu of Machine holes.
- Design Machine holes covers to withstand anticipated loads and ensure that the covers can be readily replaced if broken to minimize silt/garbage entry.
- Ensure sufficient hydraulic capacity to accommodate peak flows and adequate slope in gravity mains to prevent buildup of solids and hydrogen sulfide generation.

5.1.2 Sewage Pumping Stations and Lift Stations

Sewage Pump Station will also perform same function as sewage lift stations but cater to much larger area or sewage flow, and will also have several components, and occupy comparatively larger area.At these pumping or lifting stations, the operation involves accumulation of incoming sewage in the suction well and then pumping out as the sewage level reaches the designed pumping depth. The water level in the well rises up before the pumping cycle starts and as the pumping is performed the water level goes down registering its lowest depth at the end of pumping of cycle. This cycle of rising and lowering will continue throughout the day and night. However, the duration between successive pumping cycles will significantly vary depending on the sewage generation. During morning and evening peak hours, sewage will accumulate quickly, and pumping frequency will be high. The sewage retention time in the suction well therefore varies throughout the day, with very high retention periods during the nights and mid-days.

5.1.3 Odour from Pumping Stations

In the suction wells, the sewage emits gases, which accumulated in the air above water surface. The gas may include odorous compounds like hydrogen sulfides (H_2S), amines, fatty acids, aldehydes, ketones and other volatile organic compounds (VOCs). As the water level rises before the pumping cycle, it physically displaces the air, along with the odorous gas compounds. H_2S is the most dominant odor causing compound and therefore can cause nuisance to nearby area. When sewage becomes stagnant, H_2S is generated in the anaerobic conditions. The quantum of H_2S generation depend on quantity of accumulated sewage and sewage retention time that create anaerobic conditions. Both increase in quantity of sewage accumulation and retention time will increase the H_2S generation. Since most of the pumping stations are located in residential areas, it is propose to have tall compound wall with creepers, climbers, fragrance flower plants and green belt around the unit as an environmental safeguard. In addition, odour control mechanism are proposed in all the pumping stations, depending on size of the well and quantum of sewage, system is designed and proposed in BOQ, also maximum of 10m distance between sensitive receptors like residence, schools, hospitals etc., from the unit is kept as guiding factor.

5.1.4 Pumping station wells

Therefore proposal to develop green buffer zone around the facility with a combination of tall and densely growing trees in multi rows as per the land availability to control odour and also act as visual shield, and improve aesthetical appearance and mechanical odour control measures are proposed.Since human intervention is involved and safety shall be primary and critical consideration, additional protection by way of a metaled grating / grill work shall be provided over the sections (or full cross section if required) where workers will stand / work for inspection and repair/O and M purposes.

Provision of passive gas ventilation arrangement by providing a take-off vent from top of well by positioning vent in such a way that cover slab fitment / movement / drawl if required for maintenance purposes is not compromised.Height of vent to be provided appropriately and a minimum 2 m above the lintel level (top level) of window(s) / passageways / doors in the nearby adjoining buildings.Submersible sewage pumps of suitable rating, minimum submergencerequirements, open impeller with cutting-tearing arrangement and high strength-corrosion resistant heavy duty construction shall be proposed.

In locations / cases where sewage flow in the present to intermediate design stage is envisaged to be low, position of the submersible pumps and design of the collection well floor by providing necessary side benching / sloped flooring to allow for higher submergence during low flow shall be made to ensure regular pump operation and avoid sewage stagnation beyond the permissible limit.

Diesel Generators shall be provided for all pump stations with space for control room. In cases of lift Station (road-side or road-center type structures with only provision of kerb-side kiosk), an electrical cut-out provision shall be made for connecting an Emergency Mobile / Skid Mounted Diesel Generator for pumping out during long period of electricity supply interruption.Develop standard operating procedures / operational manual for O&M of lifting and pump stations; this shall include measures for emerge situations.Provide training to the staff in SOPs and emergency procedures.Top Covered Lifting stations are located on side of wider roads, and diameter is limited to 2.5mts, wherever government land is available diameter criteria is relaxed.

5.1.5 Noise from pumping operations

Operation of pumps and motors and diesel generators is a major source of noise. As the pumping and lifting stations are located in the residential areas, with few located very close to the houses, noise generated from lifting / pump stations can have continuous negative impacts on the surrounding population. High inside noise levels can affect the health of operators and staff at the facilities, and therefore, noise levels needs to be maintained within and outside the plant at acceptable levels.Procure good quality latest technology high pressure pumps that guarantee controlled noise at a level of around 80 dB(A) at a distance of 1 m.

Use appropriate building materials and construction techniques for pump houses which can absorb sound rather than reflect noise, use acoustic enclosures – manufacturer specified, for all pumps, motors. Procure only Central Pollution Control Board (CPCB) approved generators to meet air emission and noise level requirements. Provide sound mufflers for ventilators in the plant rooms; and sound proof doors. Provide ear plugs designated for noise reduction to workers.

5.1.6 Energy Efficiency

Project area is mostly plain and gently sloping ground, it is therefore not technically feasible or economical to design a completely gravity system to collect sewage from individual houses and transfer the same the STP. It necessitated provision of lifting and pumping stations, which are optimized to the extent possible to minimize the overall pumping. In the current design, sewage will be collected from the houses via sewer network and conveyed by gravity to the lifting station. Lifting stations are designed just to lift the sewage to higher level and deliver it to a nearby sewer Machine holes on the higher elevation, from there it can flow again by gravity, rather than pumping directly to a pumping station. This optimized the energy consumption.

To optimize the power consumption, the hydraulic design shall follow optimal approach and the following also considered in design and selection of pumping systems. According to Manual for the Development of Municipal Energy Efficiency Projects in India (jointly developed by Bureau of Energy Efficiency (BEE) and International Finance Corporation in 2008), energy savings, at minimum, of 25% to 40% is possible with appropriate measures. The followingmeasures have been considered and incorporated into the subproject designs wherever possible:

- Using low-noise and energy efficient pumping systems
- Efficient Pumping system operation
- Installation of Variable Frequency Drives (VFDs)

5.1.7 Utilities

Telephone lines, electric poles and wires, water lines, drains, if exists within the proposed project locations may require to be shifted. Some of the proposed sites are within OHT compound, small pump houses and old buildings. Since CMWSSB implementing comprehensive water supply system in all the added areas these existing structures will be defunct hence shall be removed. Existing structures do not involve any hazardous material (chemical) and shall be managed in compliance with C&D waste management rules, in coordination with GCC.

Provision is made in BOQ for dismantling of these structures. All the selected project sites are vacant and unused government lands, there are no notable existing utilities. Sewer lines are proposed mid of ways wherever road width is more than 18m and Rider mains are proposed on other sides. In such cases, the work may require shifting of utilities on the shoulder. To mitigate the adverse impacts due to relocation of the utilities, the contractor, in collaboration with the CMWSSB will

- Identify the locations and operators of these utilities to prevent unnecessary disruption of services during construction phase; and
- Instruct construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of service.

5.1.8 Site Selection of Construction Work Camps, Stockpile Areas, Storage Areas, and Disposal Areas

Priority is to locate these near the project location, but it shall be at least 100m away from residential areas, groundwater wells and surface water bodies. However, if it is deemed necessary to locate elsewhere, sites to be considered will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems.

Residential areas will not be considered for setting up construction camps to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution, dust, noise etc. It is also intended to prevent any social conflicts, shortages of amenities, and crime). Extreme care will be taken to avoid disposals near forest areas, water bodies, or its nearby areas.The contractor will prepare Waste Management Plan prior to construction and submit to CMWSSB.

5.1.9 Site Selection of Sources of Materials

Significant quantities of coarse aggregate and fine aggregate will be required for construction works. Contractor should procure these materials only from the licensed quarries with valid permits.Contractor should, to the maximum extent possible, procure material from existing quarries. It will be the main contractor's responsibility to verify the suitability and legal status of all material sources and to obtain the approval of Department of Geology and Mining and local revenue administration, as required.The record should be maintained and made available for verification by CMWSSB as and when required.

5.1.10 Social and Cultural Resources – Chance Finds

Any work involving ground disturbance can uncover and damage archaeological and historical remains. For this project, excavation will occur in project sites for foundations, laying pipelines, and for construction of underground structures at pumping/lifting stations. In the project site there are no archeologically or historically recognized sites or places close to project sites or within the project area. However in case of such finds are recognized during excavation, all necessary measures are to be taken to ensure they are protected and conserved.

Construction contractors to follow these measures in conducting any excavation work.

- Create awareness among the workers, supervisors and engineers about the chance finds during excavation work.
- Stop work immediately to allow further investigation if any finds are suspected.
- Inform State Archaeological Department if a find is suspected, and taking any action they require to ensure its removal or protection in situ.

5.2 Construction impacts

Main civil works in the subproject include laying of sewer lines and construction of sewage pumping and lifting stations at the identified sites. Sewage pumping and lifting stations works will be confined to sites, and construction will include general activities like site clearance, excavation for foundations, and creation of concrete structures will be one of the major construction activities for this project, as many of the subproject components will be fixed to concrete plinths and most will be housed in buildings with at least some concrete structural elements. Most such structures will be constructed from reinforced concrete (RC), where steel reinforcing rods and bars are placed and attached by hand to create an interior skeleton for the foundations, walls, columns, plinths, etc, and heavy-duty metal and timber/plywood formwork is bolted around the outside to build a mould into which pre-mixed concrete is poured.

Once the concrete has set, the formwork is removed, and the concrete surface is finished by masons by hand if necessary. Some buildings, such as the pump station, facilities, etc., may be constructed from brick work, in which case this work will be done using standard house-building techniques. Since these works are confined to the boundary of identified sites, there is no direct or significant interference of construction work with the surrounding land use. However, construction dust, noise, use of local roads for transportation of construction material, waste, labour camps etc., will have negative impacts, which needs to be avoided or mitigated properly.

Sewers will be laid along almost all the roads. Lateral sewers collect sewage from households provided with house service connections (proposed in this project) will be laid in all streets and roads, the larger sewers that collect sewage from tertiary sewers and convey to pumping

stations will be laid mostly on wider main roads. For all the Highways and Major road crossings, trenchless technology will be adopted.

Open cut trenching method of sewer laying involves trench excavation in the road, placing sewers in the trench, jointing and testing, and refilling with the excavated soil. Pipelines proposed are of two types, DWC (Double wall corrugated) , upto 4.5mt depth and diameter up to 600mm diameter and CI (Cast iron) pipes of Beyond 600mm diameter, and depth more than 4.5mts irrespective of diameter CI pipes are considered.

Earth work excavation will be undertaken by machine (backhoe excavator) and include danger lighting and using sight rails and barricades. The work will also be supplemented manually where there is no proper working area (e.g. very narrow streets) for the backhouse excavators. As trenches are deep (up to 5.5 m), there is risk of collapse of trenches and/or damage to surrounding buildings, safety risk to pedestrians and traffic. Necessary precautions such as bracing / shoring in the trench will be provided for The normal working hours will be 8 hours daily, the total duration of each stage depends on the soil condition and other local features. Excavated soil will be used for refilling the trench after placing the sewer and therefore residual soil after pipe laying and refilling is not significant and needs to be disposed safely.

Although sewer laying work involves quite simple techniques of civil work, the invasive nature of excavation in the urban area where there are a variety of human activities, will result in impacts to the environment and sensitive receptors such as residents, businesses, and the community in general. These anticipated impacts are temporary and for short duration, however, needs to be mitigated.

UGSS proposed under this area is well developed urban pockets of Chennai. All are busy and packed, hence Contract Company needs to take all site safety, Environmental safe guard measures strictly also PPE (Personnel protective equipment) to all who are at site shall be provided.
Anticipated impacts during the construction phase are discussed below along with appropriate mitigation measures to avoid, minimize or mitigate those impacts to acceptable levels.

5.2.1 Source of Materials

Significant amount of sand and coarse aggregate will be required for this project, which will be sourced from quarries. Quarries inevitably cause extensive physical changes; as construction materials are excavated from the ground, leaving large cavities, or levelling hillsides, etc. The physical damage caused by quarries is controlled by allowing them to operate within specific limited areas only, so the damage is restricted in extent and not allowed to spread indiscriminately.Contractor should, to the maximum extent possible, procure material from existing quarries. It will be the main contractor’s responsibility to verify the suitability and legal status of all material sources and to obtain the approval of Department of Geology and Mining and local revenue administration, as required. The record should be maintained and made available for verification by CMWSSB as and when required.

The construction contractor will be required to:

- Obtain construction materials only from government approved quarries with prior approval of PIU.
- PIU to review, and ensure that proposed quarry sources have all necessary clearances/ permissions in place prior to approval.
- Contractor to submit to PIU on a monthly basis documentation on material obtained from each source (quarry/ borrow pit).

No new borrow areas, quarries etc., and shall be developed for the project.

5.2.2 Air Quality

Construction work, especially from earthwork activities, coupled with dry and windy working conditions, material and debris transport, and works along the public roads carrying significant traffic and has high potential to generate dust in an air.

Significant quantities of earthwork will be conducted in the subproject, spread all over the project area. Also, emissions from construction vehicles, equipment, and machinery used for excavation and construction will induce impacts on the air quality. Anticipated impacts include dust and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons. Dust generation from construction work in individual and confined work sites lifting and pumping stations etc., will be mainly during the initial construction phase of earth work, as the site is confined, dust can be effectively controlled with common measures. Dust generation will be significant during sewer laying along the roads. Increase in dust/ particulate matter in ambient air is detrimental and may have adverse impacts on people and environment. To mitigate the impacts, construction contractors will be required to ensure followings for all construction works:

- Provide a dust screen (6 m high) around the construction sites of pumping and lifting stations, provide 2 m high barricades for the sewer works.
- Damp down the soil and any stockpiled material on site by water sprinkling. (Water sprinkled 3-4 times a day - before the start of work, 1-2 times in between, and at the end of the day). when working in the roads there should permanently be one person responsible for directing when water sprinkling needs to take place to stop the dust moving
- Reduce the need to sprinkle water by stabilizing surface soils where loaders, support equipment and vehicles will operate by using water and maintain surface soils in a stabilized condition.
- Apply water prior to levelling or any other earth moving activity to keep the soil moist throughout the process.
- Cover the soil stocked at the sites with tarpaulins and surround by dust screens.
- Control access to work area, prevent unnecessary movement of vehicle, public trespassing into work areas; limiting soil disturbance will minimize dust generation
- Use tarpaulins to cover the loose material (soil, sand, aggregate etc.,) when transported by open trucks.
- Control dust generation while unloading the loose material (particularly aggregate, sand, soil) at the site by sprinkling water and unloading inside the barricaded area; minimize the drop height when moving the excavated soil
- Clean wheels and undercarriage of haul trucks prior to leaving construction site
- Ensure that all the construction equipment, machinery is fitted with pollution control devises, which are operating correctly, and have a valid pollution under control (PUC) certificate.
- No vehicles or plant to be left idling at site generators to be at placed maximum distance from properties

5.2.3 For Sewer works

- Barricade the construction area using hard barricades (of 2 m height) on both sides.
- Initiate site clearance and excavation work only after barricading of the site is done.

- Confine all the material, excavated soil, debris, equipment, machinery (excavators, cranes etc.,) to the barricaded area.
- Limit the stocking of excavated material at the site; remove the excess soil from the site immediately to the designated disposal area.
- Undertake the work section wise: a 500 m section should be demarcated and barricaded; open up several such sections at a time, but care shall be taken to locate such sections in different zones.
- Conduct work sequentially - excavation, sewer laying, backfilling; testing section-wise (for a minimum length as possible) so that backfilling, stabilization of soil can be done.
- Remove the excavated soil of first section to the disposal site as the work progresses sequentially, by the time second section is excavated, the first section will be ready for back filling, use the freshly excavated soil for back filling, this will avoid stocking of material, and minimize the dust.
- Backfilled trench at any completed section after removal of barricading will be the main source of dust pollution. The traffic, pedestrian movement and wind will generate dust from backfilled section. Road restoration shall be undertaken immediately after successful testing of the section.

5.2.4 Immediate Road restoration after refilling the trench

Excavation and refilling activities disturb the top soil, and under the influence of wind, traffic, pedestrians, and other activities etc., produces dust. There is large potential to generate significant quantities of dust after refilling the trench, and prior to road relaying. It is a common practice not to restore the road immediately after refilling the trench so as to allow sufficient time for the refilled material to stabilize naturally. Given the dry and windy conditions, and heavy traffic and other activities along the roads, the refilled trenches with loose top soil along the roads will generate maximum dust, and create very unhealthy conditions. Moreover, as the barricades/dust screens will removed after the trench is refilled, there will be absolutely nothing to control the dust generation.

Dust control activities like wetting of top soil will not be effective given the site conditions. It is therefore necessary to restore/relay the road surface immediately or take suitable steps to arrest the dust. Soil consolidation technique shall be used so that road can be restored immediately. Immediately consolidate the backfilled soil and restore the road surface, if immediate road restoration is not possible, provide a layer of plain cement concrete (PCC) of suitable mix on the backfilled trench so that dust generation, erosion is arrested and it will also provide a smooth riding surface for the traffic until the road is properly restored. Backfilled trench without any road restoration is a major source of dust.

5.2.5 Surface Water Quality

Run-off from stockpiled materials and chemicals from fuels and lubricants during construction works can contaminate water quality of the receiving water bodies and streams/rivers. Project area receives rainfall in southwest and northeast monsoon seasons, between June/July to November/December. In the project area, on adjacent side in Puzhal Lake is present. Though impact will be temporary but needs to be mitigated and hence Construction contractor to ensure to implement necessary mitigation measures.

All earthworks be conducted during the dry season to prevent the problem of soil/silt run-off during rains.

- Avoid stockpiling of earth fill especially during the monsoon season; unless covered by tarpaulins or plastic sheet, do not stock earth/material close to water bodies (at least100 m)
- Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, only designated disposal areas shall be used.
- Install temporary silt traps, oil traps or sedimentation basins along the drainage leading to the water bodies;
- Place storage areas (with impermeable surface) for fuels and lubricants away from any drainage leading to water bodies, these should be at least 100 m away from water bodies and groundwater wells.
- Store fuel, construction chemicals etc., on an impervious floor, also avoid spillage by careful handling; provide spill collection sets for effective spill management.
- Dispose any wastes generated by construction activities in designated sites and conduct surface quality inspection according to the Environmental & Social Management Plan (ESMP).

5.2.6 Surface and Groundwater Quality

Another physical impact that is often associated with excavation is the effect on drainage and the local water table if groundwater and surface water collect in the voids. In this direction contractor needs to take following measures

- As far as possible control the entry of runoff from upper areas into the excavated pits, and work area by creation of temporary drains or bunds around the periphery of work area.
- Pump out the water collected in the pits / excavations to a temporary sedimentation pond dispose of only clarified water into drainage channels/streams after sedimentation in the temporary ponds.
- Avoid oil spillages, keep mechanical equipment and automobiles in good condition
- Consider safety aspects related to pit collapse due to accumulation of water.

5.2.7 Generation of Construction Wastes

Solid wastes generated from the construction activities are excess excavated earth (spoils), discarded construction materials, cement bags, wood, steel, oils, fuels, empty containers and other similar items. Domestic solid wastes may also be generated from the workers' camp. Improper waste management could cause odour and vermin problems, pollution and flow obstruction of nearby watercourses could negatively impact the landscape. The following mitigation measures to minimize impacts from waste generation shall be implemented by the contractor,

- Prepare and implement a Construction Waste (Spoils) Management Plan.
- As far as possible utilize the debris and excess soil in construction purpose, for example for raising the ground level or construction of access roads etc.
- Avoid stockpiling any excess spoils at the site for long time. Excess excavated soils should be disposed off to approved designated areas immediately.
- If disposal is required, the site shall be selected preferably from barren, infertile lands , sites should located away from residential areas, forests, water bodies and any other sensitive land uses.
- Domestic solid wastes should be properly segregated in biodegradable and non-biodegradable for collection and disposal to designated solid waste disposal site; create a compost pit (with impermeable bottom and sides) at workers camp sites for disposal of biodegradable waste; non-biodegradable / recyclable material shall be collected separately and sold in the local recycling material market.

- Residual and hazardous wastes such as oils, fuels, and lubricants shall be disposed off via licensed (by TNPCB) third parties.
- Prohibit burning of construction and/or domestic waste.
- Ensure that wastes are not haphazardly thrown in and around the project site, provide proper collection bins, and create awareness to use the dust bins, recycle waste material where possible.
- Conduct site clearance and restoration to original condition after the completion of construction work. PIU to ensure that site is properly restored prior to issuing of construction completion certificate.

5.2.8 Noise and Vibration Levels

All pumping stations, lifting stations and sewers are located within the town area. Sewer lines are spread over entire project area. All these sites are located within habitations, where there are houses, schools and hospitals, religious places and businesses. The sensitive receptors are the general population in these areas. Increase in noise level may be caused by excavation, particularly breaking of cement concrete or bitumen roads for laying of sewers, operation of construction equipment, and the transportation of equipment, materials and people. Vibration generated from construction activity, for instance from the use of pneumatic drills, will have impact on nearby buildings. Trenches deeper than 2-3 m require removal of rocks (soft to hard), will generate heavy noise and vibration. This impact is negative short-term, and reversible by mitigation measures, hence the construction contractor needs to ensures followings.

1. Plan activities in consultation with PIU so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance, especially near schools and other sensitive receptors.
2. Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and use portable acoustic street barriers to minimize sound impact to surrounding sensitive receptor.
3. Maintain maximum sound levels not exceeding 70 decibels (dBA) when measured at a distance of 10 m or more from the vehicle/s.
4. Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity; if any building at risk, structural survey be completed prior to work, to provide baseline in case any issues from vibration, and if building is structurally unsound that measures taken to avoid any further damage.
5. Horns should not be used unless it is necessary to warn other road users or animals.
6. Consult local communities in advance of the work to identify and address key issues, and avoid working at sensitive times, such as nights, religious and cultural festivals.

5.2.9 Accessibility and Traffic Disruptions

Excavation along and across the roads for laying of sewers, hauling of construction materials and operation of equipment on-site will cause traffic problems. Sewers are proposed along all the main roads and streets such as Puzhal – Red hills highways road, Madhavaram to puzhal highways road.All of the above roads are the arterial roads connecting Chennai from south to north. These roads also centers of commercial activities. There are internal important roads within the project area connecting different parts of city. As the sewer lines are proposed to be laid within the road carriage way, it will disrupt the traffic in one-traffic lane. In the narrower roads, sewers will be laid in the center of the road, and therefore during the work traffic movement will be mostly disrupted.Works related to all the remaining components (lifting and pumping stations) will be confined to the selected sites, therefore there is no direct interference of these works with the traffic and accessibility.

The impacts due to vehicular movement and construction machinery can be minimized by using the designated routes for movement of heavy vehicles and machinery to avoid the soil compaction in areas other than the site. The transportation of construction material will be generally supplied in night when the traffic is minimum. Indicative traffic management plan given below will be updated prior to the diversion of traffic where required for the construction activities.

Hauling of construction material, equipment, construction waste, etc., to and from the work site may increase the road traffic on local roads. This will further inconvenience the local community and road users. Potential impact is negative but short term and reversible by mitigation measures.

5.2.9.1 For Excavation

1. Prepare a sewer work implementation plan and undertake the work accordingly, ensure that for each road where the work is being undertaken there is an alternative road for the traffic diversion, take up the work in sequential way so that public inconvenience is minimal, Plan the sewer work in coordination with the traffic police, provide temporary diversions, where necessary with clear signage and effectively communicate with general public.

2. Avoiding conducting work in all roads in a colony at one go, it will render all roads unusable due to excavations at the same time, creating large scale inconvenience. Undertake the work section wise: a section should be demarcated and barricaded; open up several such sections at a time, but care shall be taken to locate such sections in different zones. Confine work areas in the road carriageway to the minimum possible extent, all the activities, including material and waste/surplus soil stocking should be confined to this area. Proper barricading should be provided, avoid material/surplus soil stocking in congested areas take action to immediately removed from site/ or brought to the as and when required.

3. Limit the width of trench excavation as much as possible by adopting best construction practices, adopt vertical cutting approach with proper shoring and bracing, this is especially to be practiced in narrow roads and deeper sewers, if they deep trenches are excavated with slopes, the roads may render completely unusable during the construction period. Leave spaces for access between mounds of soil to maintain access to the houses / properties, access to any house or property shall not be blocked completely, alternative arrangements, at least to maintain pedestrian access at all times to be provided.

4. Provide pedestrian access in all the locations; provide wooden/metal planks with safety rails over the open trenches at each house to maintain the access. Inform the affected local population in advance about the work schedule a week before, and a day before start of work. Plan and execute the work in such a way that the period of disturbance/ loss of access is minimum. Keep the site free from all unnecessary obstructions.

5. Necessary care to be taken during excavation to protect all the property connections (water, gas, electrical, telecom, septic tanks etc.) to avoid inconvenience to the local residents and disruption to works.

6. Notify public by prior information notices, providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints. Provide information to the public through media newspapers and local cable television (TV) services. At work site, public information/caution boards shall be provided including contact for public complaints.

5.2.9.2 Hauling (material, waste/debris and equipment) activities

1. Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites.
2. Schedule transport and hauling activities during non-peak hours (peak hours 7 to 10 AM and 4 to 7 PM).
3. Locate entry and exit points in areas where there is low potential for traffic congestion.
4. Drive vehicles in a considerate manner.
5. Notify affected public by public information notices, providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints.

5.2.9.3 Control dust generation

1. Immediately consolidate the backfilled soil and restore the road surface, this will also avoid any business loss due to dust and access inconvenience of construction work.
2. Employee best construction practices, speed up construction work with better equipment, increase workforce, etc., in the areas with predominantly commercial, and with sensitive features like hospitals, and schools.
3. Consult businesses and institutions regarding operating hours and factoring this in work schedules.
4. Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.

5.2.9.4 Socio-Economics

Sites for all projects components are carefully selected in government owned vacant lands and therefore there is no requirement for land acquisition or any resettlement. Blocking of access to the business / livelihood activities, especially during pipeline laying along the roads, may impact the income of households. However, given the alignment of pipeline within the road carriage way, and also the measures suggested for ensuring accessibility during sewer works, notable but temporary impact is envisaged. Some shops and other premises along the roads may lose business income if the access will be impeded by excavation of trenches, the presence of heavy vehicles and machinery, etc. Access disruption to hospitals, socio cultural places etc., will inconvenience public. Implementation of the following best construction measures will avoid the disturbance reduce the inconvenience and disturbance to the public.

1. Inform all businesses and residents about the nature and duration of any work well in advance so that they can make necessary preparations.
2. Do not block any access completely. Leave spaces for access between barricades/mounds of excavated soil and other stored materials and machinery, and providing footbridges so that people can crossover open trenches.
3. Barricade the construction area and regulate movement of people and vehicles in the vicinity, and maintain the surroundings safely with proper direction boards, lighting and security personnel – people should feel safe to move around.

5.2.9.5 Occupational Health and Safety

Workers need to be mindful of the occupational hazards which can arise from working in confined areas such as trenches, working at heights, near the heavy equipment operating areas etc. Potential impacts are negative and long-term but reversible by mitigation measures. The construction contractor will be required to provide all at site with personnel protective equipment such as boots, Spectacles, Hand gloves Helmets and to follow all national, state and local labour laws. Develop and implement site-specific occupational health and safety (OHS) Plan, informed by OHS risk assessment seeking to avoid, minimize and mitigate risk, which shall include measures such as:

- Safe and documented construction procedures to be followed for all site activities.
- Ensuring all workers are provided with and use personal protective equipment.
- OHS Training for all site personnel.
- Exclude public from the work sites.
- Documentation of work-related accidents.
- Follow International Standards such as the World Bank Group's Environmental, Health and Safety Guidelines.
- Ensure that qualified first-aid is provided at all times. Equipped first-aid stations shall be easily accessible throughout the sites;
- Secure all installations from unauthorized intrusion and accident risks.
- Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers.
- Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted.
- Ensure the visibility of workers through their use of high visibility vests and other PPE when working in or walking through heavy equipment operating areas.
- Ensure moving equipment is outfitted with audible back-up alarms.
- Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate.
- Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.
- Provide supplies of potable drinking water.
- Provide clean eating areas where workers are not exposed to hazardous or noxious substances.

5.2.9.6 Community Health and Safety

- Sewers works and deep excavations along the roads and narrow streets, and hauling of equipment and vehicles have potential to create safety risks to the community. Deep excavations without any proper protection may endanger the close by buildings. Hazards posed to the public, specifically in high-pedestrian areas may include traffic accidents and vehicle collision with pedestrians. Potential impact is negative but short-term and

reversible by mitigation measures. The construction contractor needs to ensure following during execution.

- Confine work areas, prevent public access to all areas where construction works are on-going through the use of barricading and security personnel.
- Attach warning signs, blinkers to the barricading to caution the public about the hazards associated with the works, and presence of deep excavation.
- Minimize the duration of time when the sewer trench is left open through careful planning; plan the work properly from excavation to refilling and road relaying.
- Control dust pollution – implement dust control measures as suggested under air quality section.
- Ensure appropriate and safe passage for pedestrians along the work sites.
- Provide road signs and flag persons to warn of on-going trenching activities.
- Restrict construction vehicle movements to defined access roads and demarcated working areas (unless in the event of an emergency).
- Enforce strict speed limit (10 - 20 kmph) for plying on unpaved roads, construction tracks.
- Provide temporary traffic control (e.g. flagmen) and signs where necessary to improve safety and smooth traffic flow.
- Where traffic is diverted around crossings, traffic control or careful selection of the exit from the working areas will be provided with the aim of ensuring that vehicles join the road in a safe manner.
- At sensitive locations particularly where there are schools and markets close to the road, awareness of safety issues will be raised through neighborhood awareness meetings
- All drivers and equipment operators will undergo safety training.
- Maintain regularly the construction equipment and vehicles; use manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure.

5.2.9.7 Construction Camps

Contractor may require setting up construction camps – for temporary storage of construction material Pipes, cement, steel, fixtures, fuel, lubricants etc.,) and stocking of surplus soil, and may also include separate living areas for migrant workers. The contractor will however be encouraged to engage local workers as much as possible. Operation of work camps can cause temporary air, noise and water pollution, and may become a source of conflicts, and unhealthy environment if not operated properly. Potential impacts are negative but short-term and reversible by mitigation measures. The construction contractor will be required to ensure,

- Consult PIU before locating project offices, sheds, and construction plants.
- Select a camp site away from residential areas (at least 100m buffer shall be maintained) or locate the camp site within the existing facilities of City Corporation.
- Avoid tree cutting for setting up camp facilities.
- Provide a proper fencing/compound wall for camp sites. Camp site shall not be located near (100 m) water bodies, flood plains, flood prone/low lying areas, or any ecologically, socially, archeologically sensitive areas
- Separate the workers living areas and material storage areas clearly with a fencing and separate entry and exit.
- Ensure conditions of livability at work camps are maintained at the highest standards possible at all times, living quarters and construction camps shall be provided with standard materials (as far as possible to use portable ready to fit-in reusable cabins with

proper ventilation), thatched huts, and facilities constructed with materials like GI sheets, tarpaulins, etc., shall not be used as accommodation for workers.

- Camp shall be provided with proper drainage, there shall not be any water accumulation.
- Provide drinking water, water for other uses, and sanitation facilities for employees, drinking water should be regularly tested to confirm that drinking water standards are met.
- Prohibit employees from cutting of trees for firewood, contractor should provide cooking fuel (cooking gas) fire wood not allowed.
- Train employees in the storage and handling of materials which can potentially cause soil contamination
- Wastewater from the camps shall be disposed properly either into sewer system, if sewer system is not available, provide on-site sanitation with septic tank and soak pit arrangements (100 m away from surface water body or groundwater well).
- Recover used oil and lubricants and reuse or remove from the site.
- Manage solid waste according to the following preference hierarchy reuse, recycling and disposal to designated areas, provide a compost pit for bio degradable waste, and non-biodegradable / recyclable waste shall be collected and sold in local market.
- Remove all wreckage, rubbish, or temporary structures which are no longer required.
- At the completion of work, camp area shall be cleaned and restored to pre-project conditions, and submit report to PIU, PIU to review and approve camp clearance and closure of work site.

5.3 Operation and Maintenance Impacts

Operation and Maintenance of the sewerage system will be carried out by CMWSSB O&M wing. Operation will involve collection and conveyance of wastewater from houses to nearest lifting /pumping stations, operation of lifting / pumping stations to pump accumulated sewage main pumping stations, operation of main pumping stations to pump accumulated sewage to STP. Proposed project does not involve new STP and annexed with STPs already under operation. Sewage sludge contains harmful substances such as bacteria and pathogens, and nutrients like nitrogen, phosphates. Improper handling and disposal of the sludge will have adverse impacts on health and environment however a proper sludge management is already happening in existing STPs.

5.3.1 Quality of Raw Sewage

As mentioned earlier, one of the critical aspects in STP operation is change in raw sewage characteristics at inlet of STP may affect the process and output quality. The system is designed for municipal wastewater, which does not include industrial effluent. Characteristics of industrial effluent widely vary depending on the type of industry, and therefore disposal of effluent into sewers may greatly vary the inlet quality at STP, and will upset process and affect the efficiency, hence industrial effluents must not be allowed to system. Following measures are to be implemented:

- No wastewater from industrial premises (including domestic wastewater) shall be allowed to dispose into municipal sewers.
- Monitor regularly and ensure that there is no illegal discharge through Machine holes or inspection chambers; conduct public awareness programs; in coordination with TNPCB

5.3.2 Odour and Noise from Sewage lifting and pumping stations

Various measures are such as green belt, high compound wall with climbers, so that air cant entrap in atmosphere, fragrant flower plants with land scaping and Mechanical type of

odourcontrol proposals are included in the design of these facilities giving utmost importance to odour and noise.

Therefore it is anticipated there will not be any significant generation of odour or noise that will impact the surrounding households. Following measures are to be implemented during the operation:

- Strictly follow standard operating procedures/operational manual for operation and maintenance of lifting and pump stations.
- Ensure that operating staff is properly trained, and have clear understanding of odor issues vis a vis its relation with operational practices.
- Ensure that pumping cycles are properly followed; and there is no buildup of sewage beyond design volume in the wells.
- Conduct H2S monitoring (periodically at pumping stations and lifting stations).

5.3.3 Sewer network

During the system design life (15/30 years for mechanical/civil components) it shall not require major repairs or refurbishments and should operate with little maintenance beyond routine actions required to keep the equipment in working order. The stability and integrity of the system will be monitored periodically to detect any problems and allow remedial action if required. Any repairs will be small-scale involving manual, temporary, and short-term works involving regular checking and recording of performance for signs of deterioration, servicing and replacement of parts.

There are also certain environmental risks from the operation of the sewer system, most notably from leaking sewer pipes as untreated fecal material can damage human health and contaminate both soil and groundwater. It will be imperative therefore that the operating agency establishes a procedure to routinely check the operation and integrity of the sewers, and to implement rapid and effective repairs where necessary. There is an occupation health risk to workers engaged in sewer maintenance activities. Following measures should be followed:

- Regular cleaning of grit chambers and sewer lines to remove grease, grit, and other debris that may lead to sewer backups. Cleaning should be conducted more frequently for problem areas.
- Inspection of the condition of sanitary sewer structures and identifying areas that need repair or maintenance. Items to note may include cracked/deteriorating pipes, leaking joints or seals at Machine holes; frequent line blockages, lines that generally flow at or near capacity and suspected infiltration or exfiltration.
- Monitoring of sewer flow to identify potential inflows and outflows.
- Conduct repairs on priority based on the nature and severity of the problem. Immediate clearing of blockage or repair is warranted where an over flow is occurring or for urgent problems that may cause an imminent overflow (e.g. pump station failures, sewer line ruptures, or sewer line blockages)
- Maintain records, review previous sewer maintenance records to help identify “hot spots” or areas with frequent maintenance problems and locations of potential system failure, and conduct preventative maintenance, rehabilitation, or replacement of lines as needed;
- When a spill, leak, and/or overflow occurs, keep sewage from entering the storm drain system by covering or blocking storm drain inlets or by containing and diverting the sewage away from open channels and other storm drain facilities (using sandbags, inflatable dams, etc.). Remove the sewage using vacuum equipment or use other measures to divert it back to the sanitary sewer system.

- Prohibit/prevent disposal of wastewater/effluent from industrial units in the sewers; ensure regular checking to ensure no illegal entry of industrial wastewater into sewers
- Develop an Emergency Response System for the sewerage system leaks, burst and overflows, etc.
- Provide necessary health and safety training to the staff in sewer cleaning and maintenance
- Provide all necessary personnel protection equipment
- Do not conduct manual cleaning of sewers; for personnel engaged sewer maintenance work, there is a risk due to oxygen deficiency and harmful gaseous emissions (hydrogen sulfide, methane, etc.) provide for adequate equipment (including oxygen masks) for emergency use.

5.4 Social Impact Assessment

5.4.1 Project components and social impacts

Component wise social impacts are explained in detail in the following Table

Table 24: Project Components and Social Impacts Matrix

Area	Collection System (m)	MH (Nos)	Pumping Main(Km)	LS (Nos)	SPS (Nos)	STP
Vadaperumbakkam, Theeyambakkam, Mathur, Puzhal and Kathirvedu (Left out)	18384	7087	30.57	11	10	Kodungaiyur
Description	The collection system comprises of laying of sewer line with machine holes for every 30m. The line will be laid in the middle of the road by cutting open the black to portions.	The MHs are having provision for house service connections. Each MH will be able to connect five houses on either side	Pumping main with varying size (dia) (150mm to 1000mm) is proposed. The pumping mains will be laid in the berm of the road within the carriage width of the ROW.	ARY/LS-01 ARY/LS-02 TY/LS-01 VDP/LS-01 VDP/LS-02 KSP/LS-01 PZ/LS-01 PZ/LS-01 PZ/LS-03 KTV/LS-01 MT/LS-01	1. VDP/SPS-01 2. VDP/SPS-02 3. CTM/SPS-01 4. KSP/SPS-01 5. PZ/SPS-01 6. PZSPS-02 7. PZ/SPS-03 8. MT/SPS-01 9. MT/SPS-02 10. MT/SPS-03	It is proposed to convey the collected sewage towards main pumping station located in Mathur (MT/SPS-01) and further disposal and treatment process to be carried our at the existing 110 MLD STP located at Kodungaiyur.
Social Impacts	The sewer line will be laid in the roads under the control of	The MHs will be constructed in the middle of	The land use of the project area is mostly	The above sites are free from encumbr	The above sites are free from encumbrances and	The collected sewage is disposed into the existing STPs for

	Greater Chennai Corporation. There are 6potentialtemporary economic impact	the road. Hence there is no permanent or temporary resettlement impacts.	residential. Hence laying of pumping main is devoid of permanent and temporary resettlement impacts.	ances and permanent or temporary resettlement impacts are not envisaged	permanent or temporary resettlement impacts are not envisaged	treatment and disposal. Hence no permanent or temporary involuntary impacts.
Risk Assessment	Moderate Risk	Low Risk	Low Risk	Low Risk	Low Risk	Low Risk

5.4.1 Social Screening Survey

The social survey was carried out on 21-02-2023 to identify the potential temporary economic impacts in the project area. As per the ECSMF entitelement matrix, the potential temporary economic impacts are compensated for 7 days with notified minimum wage of Rs. 643 per day. The total of Rs.27006/- shall be given for potential temporary economic impacts.The survey alignment, data analysis, cut-off date and photographs are provided in the Annexure 9.

5.4.2 Awareness about the project

The respondents are well aware about the project, its purpose to provide sewer line connection, impacts, compensation, etc. The Potential Temporary Economic Impacts's and other stakeholders from study area were receptive for the proposed project.The stakeholder engagement plan (SEP) is given in the Annexure 7. Further, the pictures of Potential Temporary Economic Impacts identified and consultations held with them are given in Annexure9

5.5 Pumping Stations and Lift stations

Twenty one numbers of pumping stations (SPS-10 Nos. & LS-11 Nos) are proposed to pump the collected sewage to the existing STP in Kodungaiyur for this project. The details of each of the pumping station is summarised below. Typical specifications of the pumping station comprises of two wells with varying dia, interconnecting pipes, pumping arrangements, odour control mechanism, grit pits pumping room, transformer yard, inlet and outlet pipes, compound wall on all the four sides, tree plantation etc. This is confined to a single site. There is no social impacts in this site.

5.5.1 ARY/LS-01

Ariyalur village and adjacent streets are proposed to be covered under this lift station. It is a Roadside Pumping Station, proposed at an existing OHT site at Perumal Koil Street. **There is no social impact in this site.**

5.5.2 ARY/LS-02

AndarkuppamRedhills road and cross roads are the important streets covered under this lift station.There is 1 potential impact founded in MT/SPS-01.**There no social impact in this site.**

5.5.3 TY/LS-01

This sub zone covers the northwest tip of Theeyambakkam, important streets included are AndarkuppamRedhills Road, SendurkuppamKosappur Road, SendurkuppamVinchoor Road etc., TY/LS-01 is a Roadside Lift Station at the junction of SendrakuppamVichoor road and a village road towards east. **There is no social impacts in this site.**

5.5.4 VDP/LS-01

Area between Madhavaram Redhills Road and Kosasthalaiyar river like Chennathoppu, TG Swamy Nagar etc., is the catchment area for this lift station. **There is no social impact in this site.**

5.5.5 VDP/LS-02

Upcoming new layouts in vadaperumbakkam, Annai Nagar, AndrakuppamRedhills Road in vadaperumbakkam limits are covered under this subzone. **There is no social impact in this site.**

5.5.6 KSP/LS-01

SendrambakkamKosappur road and cross streets are the important streets covered under this lift station. **There is no social impact in this site.**

5.5.7 PZ/LS-01

Western part of NH 5 between Surapet Main Road and PeramburRedhills High Road in Puzhal is the catchment area for lift station PZ/LS-01. Since NH 5 profile falling from 22m at Surapet Main Road to 10 m at Mathew street junction, flow from these streets could not be transport through gravity up to proposed SPS at KS Nagar (PZ/SPS-01) in north-west part of Puzhal. Hence, a road side lift station is proposed at Mathew road junction on National highway. **There is no social impact in this site.**

5.5.8 PZ/LS-02

VS Mani Nagar, west of Madhavaram Redhills Road in Puzhal from south boundary up to Kosastalaiyar River in north is the area covered under this lift station. In view of avoiding

crossing Madhavaram Redhills Road through gravity main, road side lift station is proposed in Vegetarian Nagar. **There is no social impact in this site.**

5.5.9 PZ/LS-03

East side of Madhavaram Redhills Road between south boundary line of PuzhaluptoKosastalaiyar River is the area covered under this lift station. As in the subzone of lift station PZ/LS-02 here also, to avoid crossing of Madhavaram Redhills Road through gravity main, road side lift station is proposed opposite to JK Mahal in Madhavaram Redhills Road. **There is no social impacts in this site.**

5.5.10 KTV/LS-01

MGR Nagar in the eastern part of NH covering Madhura MettuPalayam Street, Reddy Street, Lingam Street, tiny parts of Ottravadai Street, Bajanai Koil Street &Mettu 3rd Street from Puzhal are the catchment area for this lift station. **There is no social impacts in this site.**

5.5.11 MT/LS-01

Masilamani Nagar, Kamarajar 8th street south of Kamarajar Salai are covered under this lift station. It is a road side lift station proposed at junction of Kamarajar Salai and Manali Kossapurroad.There is 2 potential social economic idendentified (Road Mariginal worker and Street vendors). **There is no social impact in this site.**

5.5.12 VDP/SPS-01

Parvatahipuram, Ponagar, Balaji Nagar etc., of Vadaperumbakkam are the important localities covered under this sewer subzone. Waste water inputs from sewer subzone VDP/SPS-02 is also added in to this pumping station. **There is no social impact in this site.**

5.5.13 VDP/SPS-02

Important areas covered under collection system of this pumping station are ThanikachalamNagar,SamuvelNagar, Sabari Nagar, etc., Pumping station is proposed at CMWSSB owned land near Perumal koil street of Vadaperumbakkam. **There is no social impact in this site.**

5.5.14 CTM/SPS-01

Kossapur revenue village, developments along AndarkuppamKosappur Road are the prominent areas covered here. Sewage inputs from subzone VDP/SPS-01 also added in this pumping station. **There is no social impact in this site.**

5.5.15 KSP/SPS-01

Sewage pumping station KSP/SPS-01 is the terminal pumping station for the sewer system of Kadapakkam (Zone-7B), Theeyambakkam (TY/LS-01, ARY/LS-01, ARY/LS-02 & KSP/LS-01) and Vadaperumbakkam (VDP/LS-01, VDP/LS-02, VDP/SPS-01, VDP/SPS-02 & CTM/SPS-01). Waste water contribution from these areas are reaching here through collection system and Pumping Mains from the pumping stations located at different parts. Pumping station KSP/SPS-01 is proposed to serve the sewer collection system mainly of AndarkuppamRedhills Road, Perumal Koil street, Periyar Nagar, KossapurAndarkuppam Road, Kosappur Main Road, etc.,. Pumping station is proposed in a CMWSSB OHT Site. **There is no social impact in this site.**

5.5.16 PZ/SPS-01

Kannappa Swamy Nagar, bounded between Alinjivakkam on North ,Central jail on south, NH 5 on east and Puzhal lake bund on west is area covered under this pumping station. Pumping station is proposed at existing OHT site in Kannappa Swamy Nagar 26th Street. **There is no social impact in this site.**

5.5.17 PZ/SPS-02

East side of NH 5 bounded between boundary line of Puzhal on North, NH 5 on West, Gandhi Main Road on South and Balaji Nagar on East is the area covered under this pumping station. Pumping station is proposed at Dhanalakshmi Nagar 2nd Street. Important areas covered are Tamilan Nagar, Shakthivel Nagar, Kannadapalaiyam, Kavangarai, Ram Nagar, Kanchi Arul Nagar, Dhanalakshmi Nagar, etc.,. Sewage inputs from subzone PZ/SPS-01 also added in this pumping station. **There is no social impact in this site.**

5.5.18 PZ/SPS-03

PZ/SPS-03 is the terminal pumping station as Puzhal is concerned. Entire waste water from Puzhal& left out streets of MGR Nagar in Kathirvedu is ultimately collected at this Pumping Station and further conveyed to Sub zone MT/SPS-01. East side of NH in Puzhal is the catchment area, important areas covered are Mettupalayam, St. Antony Nagar, Mahalakshmi Nagar, Lyon, Thirukumaran Nagar, OttraVadai Street, Balaji Nagar, etc., **There is no social impacts in this site.**

5.5.19 MT/SPS-01

MT/SPS-01 is the terminal pumping station (MPS) for entire project area which includes Theeyambakkam, Vadaperumbakkam, part of Mathur, Puzhal and left out streets of Kathirvedu. Gopalaswamy Nagar, Chinnswamy Nagar, Kamaraj Nagar, Ponniammankoil streets are the primary catchment area for this pumping station. In addition, it receives flow from 11 lift stations and 7 pumping stations placed at different locations of project area. Pumping station is proposed in CMWSSB owned OHT site for WSS in Mathur - Manali KossapurRoad.There is 1

potential economic people impact founded in MT/SPS-01.**There is no social impacts in this site.**

5.5.20 MT/SPS-02

Bharathi Nagar, Chinna Mathur are the important area covered here. Pumping station is proposed in CMWSSB owned site at Chinna Mathur. **There is no social impacts in this site**

5.5.21 MT/SPS-03

MMDA colony is the primary catchment area for this pumping station. In addition, it also caters flow from MT/SPS-02. Pumping station is proposed at existing SPS site in MMDA colony 3rdMain Road.There is 2 potential social economic people founded. **There is no social impact in this site.**

5.6 Conclusion

However, if temporary or permanent resettlement impacts are identified in addition to the potential temporary economic impacts identified, during project implementation, the implementing agency will prepare a Resettlement Plan/ update ESIA as per the updated ECSMF and compensate the ProjectAffectedPerson(PAP) based on the entitlement matrix set out in the ECSMF.

CHAPTER 6 Analysis of Alternatives

The present proposal consists of providing comprehensive sewerage system covering 183.84Km length of Collection System, which consists of 21 nos. of Sub pumping stations/Lift stations and pumping mains for a length of 30.56 Km to convey the sewage to the existing Sewage Treatment Plant in Kodungaiyur.

6.1 Technology Alternatives

A comparison of Technology alternatives to the above proposal is summarized as below:

6.1.1 Decentralised system

By this system, pockets of area (zoning) have to be considered for providing UGSS in a decentralized way, which will have the following disadvantages:

- Not cost effective.
- Environmental impact is more by considering the small area in which more number of Pumping Station and Treatment Plant has to be considered in the midst of the Residential area.
- Period of completion cannot be scheduled in a comprehensive way as each pocket (zone) will be started in a different time frame.

6.1.2 Septage Management

By this system, each household will have a separate septic tank for collection of sewage individually and it has to be decanted to the nearest Pumping Station/Treatment Plant in a definite time accordingly to cycle their individual capacity, which will have the following disadvantages against the proposal of comprehensive Sewerage System considered in this project.

The goal of:

- Eradication of open defecation cannot be achieved.
- Providing sanitation to all with the service level benchmark of 100% cannot be chieved holistically.
- Sewerage facilities on par with the erstwhile Chennai City cannot be achieved.
- Better platform for improved quality of living, development and growth of project area.
- Most importantly, every Citizen of the Nation to achieve fundamental right of access to the basic civic amenities/facilities cannot be achieved.

6.2 Infrastructure Alternatives

The sites for the construction of Pumping Station had been carefully chosen based on the availability (ownership) of land, topography for the construction of 10numbers of SPS and 11 numbers of LS considered in this proposal. It is also ascertained that the site is chosen so that Land alienation process is very less.As such, the site location chosen below is the best alternative considering all the factors including Social and Economic factors.Land details and location of sub project area is annexed in Annexure-2.

6.2.1. Land details

Table 25: Land details and location of the sub projects

S. No	Location	LS / SPS	Coordinates	Location of Pumping Station	Survey No.	Classification	Ownership	Extent of land required (Sq.m)	Existing Land use on site	Remarks
VADAPERUMBAKKAM - THEEYAMBAKKAM										
1	Lift Stations	ARY / LS-01	13°11'26.3"N 80°15'03.8"E	Perumal Koil Street	-	-	GCC	16 Sq.m	Existing OHT site	Road side
2	Lift Stations	ARY / LS-02	13°11'28.8"N 80°14'18.6"E	Perumal koil Street, Periyar Nagar	-	-	CMWSSB	80 Sq.m	Existing filter bed site	Under CMWSSB possession
3	Lift Stations	TY / LS-01	13°11'40.8"N 80°13'57.2"E	Pillayar Koil Street	-	-	GCC	16 Sq.m	Vacant land	Road side
4	Lift Stations	VDP / LS-01	13°10'30.9"N 80°12'55.0"E	Madhavaram Redhills Road	21	Grama natham	CMWSSB	45 Sq.m	Existing Borewell cum OHT site	Under CMWSSB possession
5	Lift Stations	VDP / LS-02	13°10'53.5"N 80°13'22.6"E	Annai Nagar	-	-	GCC	16 Sq.m	Vacant land	Road side
6	Sub pumping Station	VDP / SPS-01	13°10'39.3"N 80°13'34.5"E	Samuel Nagar Burial Ground	201/33	Burial Ground	GCC	624 Sq.m	Burial ground	NOC obtained from GCC
7	Sub pumping Station	VDP / SPS-02	13°10'33.3"N 80°13'04.8"E	Perumal Koil Street	96/1	Grama natham – Govt. Poramboke	Revenue	806 Sq.m	Vacant land	GO (Ms) No.267, dt. 17.07.2015 obtained from

										Revenue Dept
8	Sub pumping Station	CTM / SPS-01	13°10'51.8"N 80°13'45.7"E	Mariamman Koil Street, Chettimedu	19	Meikkal	Revenue	676 Sq.m	Vacant land	Enter upon permission obtained from Revenue Dept
9	Lift Stations	KSP / LS-01	13°10'55.9"N 80°14'05.2"E	SendrambakkamKosappur Road	-	-	GCC	16 Sq.m	Vacant land	Road side
10	Sub pumping Station	KSP / SPS-01	13°11'23.0"N 80°14'19.0"E	Perumal Koil Street, Manali Kosappur Road	165	Grama natham	CMWSSB	378 Sq.m	Existing OHT site	Under CMWSSB possession
PUZHAL & KATHIRVEDU										
11	Lift Stations	PZ / LS-01	13°09'07.3"N 80°12'34.3"E	Service Road of Grant Northern Trunk (GNT)Road, near to Bus stop	-	-	GCC	16 Sq.m	Vacant land	Road side
12	Lift Stations	PZ / LS-02	13°09'50.1"N 80°12'59.4"E	Abinandha Street, Vegetarian Nagar	-	-	GCC	16 Sq.m	Vacant land	Road side
13	Lift Stations	PZ / LS-03	13°10'00.2"N 80°13'24.5"E	Madhavaram Redhills Road (Opp. To JK Mahal)	-	-	GCC	16 Sq.m	Vacant land	Road side
14	Lift Stations	KTV / LS-01	13°09'29.7"N 80°12'34.6"E	Gangadharan Street, near GCC Park	-	-	GCC	16 Sq.m	Vacant land	Road side
15	Sub pumping Station	PZ / SPS-01	13°10'17.6"N 80°11'43.4"E	Kannappa Swamy Nagar 26th Street	443/2A2	-	CMWSSB	960 Sq.m	Existing OHT site	Under CMWSSB possession
16	Sub pumping Station	PZ / SPS-02	13°10'15.7"N 80°12'36.5"E	Dhanalakshmi Nagar 2nd Street	279	Kuttai	Revenue	990 Sq.m	Vacant land	Letter for Land acquisition has been sent to Revenue Dept
17	Sub pumping Station	PZ / SPS-03	13°09'50.1"N 80°12'59.4"E	Balaji Nagar 3rdMain Road (Opp. To Taluk Office)	120	Panchar	Revenue	750 Sq.m	Vacant land	Enter upon permission obtained from Revenue Dept
MATHUR										
18	Lift Stations	MT / LS-01	13°10'05.5"N 80°14'10.8"E	Manali Kosappur Road	-	-	GCC	16 Sq.m	Vacant land	Road side

19	Sub pumping Station	MT / SPS-01	13°09'48.3"N 80°14'42.4"E	Manali Kosappur Road	136/2A1 (Part)	-	CPCL layout	375 Sq.m	OHT site	Under CMWSSB possession
20	Sub pumping Station	MT / SPS-02	13°10'40.2"N 80°15'06.5"E	Bharathi Nagar 3rd Street	68	-	CMWSSB	40 x 40 m	Vacant land	Under CMWSSB possession
21	Sub pumping Station	MT / SPS-03	13°10'02.9"N 80°15'00.4"E	MMDA 3rd Main Road	LP, S&S, MMDA-6/90	-	CMWSSB	31 x 25 m	Existing SPS site	Under CMWSSB possession

6.3 Conclusion

On analyzing the technology alternatives and site alternatives as stated above,considering all other factors such as taking into account of sewerage facilities already provided 30 years agoin Puzhal, Mathur, Kathirvedu (left out), Vadaperumbakkam, Theeyambakkam, it can be very well concluded that providing comprehensive UGSS for Puzhal, Mathur, Kathirvedu (left out),Vadaperumbakkam, Theeyambakkam area as per above proposal is the best.

CHAPTER-7Environmental and Social Standards and Risk Classification

7.1 Applicable Environmental and Social Standards

Relevance of the 10 Environmental and Social Standards is provided below.

Environmental and Social Standards	Relevance to this project & actions
ESS1 Assessment and Management of Environmental and Social Risks and Impacts	This project involves construction of manholes, pumping stations, laying of sewer line, pumping mains, transmission mains and also involves project utility sites. There are no sensitive or protected environmental features within the project area. The impacts due to the project construction. ESS1 is relevant for this sub-project.
ESS2 Labor and Working Conditions	Labours including migrant labour, local labours according to the skill sets will be expected to be engaged. ESS2 is relevant for this project. As per ESS2, LMP is to be prepared by the contractor. The LMP will describe the findings of the ESIA, national labor policies and practices, the types of project workers that are likely to be involved, worker influx, the procedures to apply ESS2, and a grievance mechanism. ESS2 is relevant for this sub-project.
ESS3 Resource Efficiency and Pollution Prevention and Management	There will be Air, Noise, Water pollution during the implementation and which will be managed through ECSMF. ESS3 is relevant for this sub-project.
ESS4 Community Health and Safety	Risk to community health and safety is considered as minor and manageable through ESMP. During implementation pedestrian, vehicles, labour working in the trench excavation works and laying of sewer lines and appropriate safety measures will be included in the ESMP. ESS4 is relevant for this sub-project.
ESS5 Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	There is no land acquisition, restricts on land use and involuntary resettlement requirements. Sewer mains will be laid in the centre of public roads, within the road carriage way, and pumping/lifting stations will be constructed on identified government owned vacant

	lands. Temporary restrictions in movement may be there due to laying of sewer mains. There may be potential temporary economic impacts to vendors, while laying of sewer lines GRM to be in place prior to starting of the works as per updated ECSMF. ESS5 is relevant for this sub-project.
ESS6 Biodiversity Conservation and Sustainable Management of Living Natural Resources	The project caters to the developed urban area and project sites are located within the project area adjacent to developments, the project activities will not have impacts on natural habitat and biodiversity. ESS6 is not relevant to this sub-project.
ESS7 Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	ESS7 is not relevant to this sub-project.
ESS8 Cultural Heritage	The project area does not have any protected site or monuments of cultural importance. However, chance find procedures have been included as part of the ESMP for compliance during project implementation. ESS8 is not relevant to this sub-project.
ESS9 Financial Intermediaries	ESS9 is not relevant to this sub-project.
ESS10 Stakeholder Engagement and Information Disclosure	Accordingly, Stakeholder Engagement Plan is prepared and included in the ESIA. This ESS10 is applicable to the sub-project.

The relevance of Environemental Social Standards 1 to 10 of the World Bank ESF is explained in the above Table. The Subproject is likely to have numerous positive impacts on the environment and public health. No sewage treatment facility is included in the subproject as it is proposed to utilize the available capacity of existing sewage treatment plant (STP). According to technical studies, the existing STPatKodungaiyurwill be utilized for treating the sewage generated from the sub-project area and their existing capacities are also found to be adequate. Further, theSTPis functioning normally, and treating the sewage to discharge standards specified by Tamil Nadu Pollution Control Board (TNPCB).

Proper functioning of STP is critical for the sustainability of new sewer infrastructure and realization of intended purpose (removing the human waste from those areas served by the network rapidly and treated to an acceptable standard) and benefits (improved environmental conditions, public health, etc.). The above STP are equipped with inbuilt lab facilities and the quality parameters are analysed daily in addition to the quality parameters monitored by TNPCB on monthly basis. Sludge generated from STP is used to generate bio gas (methane CH4) by way of sludge digestion, which then used as fuel to generate electricity. The generated electricity is used to operate the STP. The above process reduces the carbon emissions to the

atmosphere by way of methane capture from the raw sludge. The digested sludge is then fed into mechanical centrifuge for dewatering the sludge. The dewatered sludge cakes is then collected and disposed into the corporation dump site.

In order to further improve and enhance the operation of STP, CMWSSB has taken various initiatives and appointed consultants to study the existing sludge management system at the STP, and suggest reuse options. This will further improve the efficiency of the existing sewage treatment systems. As the subproject utilizes existing STP that are functioning properly, no adverse impacts are envisaged.

CHAPTER-8 Environmental and Social Management Plan (ESMP)

8.1 Objectives

The ESMP is developed to mitigate the adverse E&S risks and impacts of sewage water line project at project area. It explains the mitigation measures, responsibility, implementation phase, monitoring method, monitoring indicators and frequency during pre-construction, construction, operation and decommissioning phases. The Contractor supervised by the PIU is mainly responsible for the implementation of plans during the project life cycle. The project specific ESMP is provided in below the Table 24.

Table 26: Environmental and Social Management Plan

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
Pre-construction phase							
1.1	Engineering design and alternative analysis	Ensure that the investigation and analysis of alternative engineering design and technologies, and the route location of the proposed sewer line network (the project) cause minimum environmental and social risk and impact during the project cycle; Ensure the activities like trenching, excavation, pipes joint welding result into minimum or no loss to	PIU/PMC, Contractor	Design/Pre-construction	Review the performance of design and technology and route decided for the project; and consult the experts and learn from the experiences gained from such projects elsewhere	Minimum E&S risk and impact; Minimum or no impact on local ecology, water bodies and forest; Minimum impact on land and livelihood of local communities ; and cost	Periodically

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		terrestrial ecosystem; and Alternatives in terms of cost effectiveness, low maintenance, minimum and area for pipeline route selected along the existing roads for the project will cause minimum E&S impact. Construction of compound wall around pumping stations, chain-link mesh above with climbers and creepers are proposed to act as screen. Tree cover (depending upon space availability) along the compound wall is proposed as they are good absorbers of Sulphur dioxide. Trees, shrubs having dense foliage with a large surface area fits requirements, because leaves absorb				effective and O&M efficient.	

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		pollutants, evergreen trees are found to be more effective, and follow mentioned species are proposed. Provide mechanical odour control equipments in the pumping stations and lifting station to mitigate odour nuisance.					
1.2	Utility relocation	Identify the common utilities to be affected such as telephone cables, electric cables, electric poles, water pipelines, public water taps, etc; and Seek prior approval and inform the concerned agencies for utilities shifting before construction starts.	PIU /PMC, Contractor/ Authority of concerned utilities	Pre construction phase	Review detailed layout plan and site inspection	Utilities shifted in time where necessary	One time
1.3	Permits and approvals	Obtain all permits and approvals required for E&S aspects during pre-construction, construction, operation and decommissioning phases. Ensure that all	PIU /PMC, Contractor	Before construction commences	Keep record of all permit, approvals and authorizations	Permits and approvals are available	One to two times

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		necessary approvals for construction to be obtained by contractor like labourlicence / labour insurance are obtained before start of construction.	Contractor				
1.4	Source of Materials	Obtain construction materials only from government approved quarries with prior approval of PIU. PIU to review, and ensure that proposed quarry sources have all necessary clearances/ permissions in place prior to approval. Contractor to submit to PIU on a monthly basis documentation on material obtained from each sources (quarry/ borrow pit) No new borrow areas, quarries etc., shall be developed for the project;	PIU /PMC, Contractor	Pre-Construction and Construction Phase	Records, approvals	Approvals available	Periodically
1.5	Material storage	Storing the pipeline fittings and associated	Contractor/ CMWSSB/ PMC	Pre- construction	Site inspection	Location and its	Semi-annually

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
	and portable office cabin	materials; Establish a suitable place for site camp at the start of the civil works, which will allow for site offices in portable cabin.				access; and Basic facilities and civic amenities.	
1.6	Labour accommodation and facilities	Identify the suitable building in terms of location, sufficient area, access, security, basic amenities, etc. Follow all relevant provisions of the Contract Labour (Regulation and Abolition) Act, 1970, IFC guidelines, the Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act,1996, ILO convention 62-Safety provisions (Building) Convention and applicable laws for rented labour accommodation;	Contractor	During Pre-construction	Visual inspection; Consultations with labour, and local communities nearby; Site inspection; Facilities made available; Type of illness and its causes; and Discussions about the level of health awareness and safety precautions taken by the workers while working on the	All the facilities available as per law and standards; Assess the satisfaction level of labourers; Cordial relation between labour and local communities ; Easy access of first-aid box with required medicine and	Everyday

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		The location, layout and basic facility provision for labour accommodation will be reviewed by the Convenor and suggestions to be communicated to the contractor prior to the construction; Maintain necessary living accommodation and ancillary facilities in functional and hygienic conditions; Provide adequate number of toilets, bathing area, kitchen, safe fuel/ LPG for cooking and uncontaminated water for drinking, cooking and washing; Prohibit employees from cutting of trees for firewood; fire wood not allowed; Labour accommodation and temporary shade			work site.	accessories at each working site, labour accommodation, labour and office to workers all the time; and Arrangement made with the Doctors at then nearest government health and medical center/ private clinic.	

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		near work sites shall provide protection from heat, rain, flooding, insects, snakes and mosquitoes. It should have adequate provisions for emergency such as fire safety, security, etc; Adequate healthcare is to be provided for the workforce; Ensure adequate water supply in all toilets and urinals; Provide separate toilets/ bathrooms for women laborers and shall be screened from those for men (marked in vernacular language. Provide first aid medical kit at labour accommodation, temporary labour shed and working site; train the labour for usage of items in injury, emergency, coordinate with nearest					

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		government and private medical centers for the medical services, display the contact number of medical doctor(s) and keep a vehicle for emergency travel all the time; As per provisions of WHO and MOHFW guidelines of Covid-19, sanitizer, soap, mask, etc. should be made available in sufficient quantity and its use by the workers mandatorily and maintain social distancing all the time; The contractor will provide garbage bins in the camps and ensure that these are regularly emptied and disposed off in co-ordination with the CMWSSB / GCC. Ensure medical tests and treatment of Covid-19 positive cases immediately; and					

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		Maintain the required data and documents at site and regularly submit the compliance report to the PIU. Contractor to prepare and submit the Labour Management Plan to the project engineer.					
1.7	Public disclosure	Ensure timely and fully project information dissemination through distribution of prior notice, pamphlet in local language, oral communication, meetings, websites, etc.	PIU/PMC, Contractor	Pre- construction phase	Consultation with potential temporary economic impacts and other stakeholders	Methods used for public disclosure; and Project awareness.	One time
1.8	Grievances redressal system	Establish the efficient grievance redressal mechanism and accordingly constitute the grievance redressal committee (GRC) as outlined in the ESIA project level with representatives of all the stakeholders as members, including women and vulnerable groups of local	CMWSSB /PMC, Contractor	Project life cycle	Review the proceeding and minutes of meetings; and Consultations with the members of GRC.	GRC established; GRC meetings held; Number of cases received and resolved;	Monthly or as required

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		communities; Ensure the wider publicity of procedure, functioning and availability of GRC since the inception of the project; All the grievances received shall be acknowledged and proper recording and tracking should be carried out; GRC will adjudicate the complaints in 6-8 weeks depending upon the severity of case; Convenor will be the coordinator for organizing GRC meetings as required, writing the proceedings, minutes of meeting, informing the aggrieved party about the decision of GRC, etc;				Decision taken with in a timeframe; and Court case filed or with drawn.	

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
1.9	Sensitive Areas	The sensitive areas like Schools, hospitals to be provided with suitable noise barriers and safety measures, prior to the start of work in order to minimize the dust and noise impacts due to vehicle movement during construction and their effectiveness to be checked.	PIU /PMC, Contractor	Pre- construction phase	Site inspection	Location and its access; and Basic facilities and civic amenities.	Periodically
Construction and operation phases							
2.1	Labour mobilization	Contractor shall prepare a Labour Management Plan which shall be reviewed by the Engineer incharge of PIU and approved. Accordingly, mobilize the labour on worksite for the laying of sewer line, machine hole, chambers and construction of pumping stations, lift stations and control rooms if any.	Contractor, PMC/PIU	Construction phase	Review site management and labourplan; and Site inspection	Number and date of labourmobilization; and Date of starting works.	Periodically
2.2	Appointme	The contractor will	Contractor	Pre-Construction	Review	No	One time

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
	nt and Mobilization of Environment & Safety Officer	appoint qualified and experienced Environment & Safety Officer (ESO), who will be mobilized prior to start of works. ESO will dedicatedly work and ensure implementation of Environmental Management Plan including Occupational, Health and Safety measures during the project implementation.		Phase	reports and records	compliance at site	
2.3.	Site clearance, Jungle clearance, Tree cutting, etc.	Identify the number of trees that will be affected with girth size and species type. Avoid tree cutting and loss of vegetation, shrubs, grasses, etc. to the maximum extent possible; Trees where necessary shall be removed from the construction site before commencement of construction with prior permission from the concern department and other	Contractor, PIU/PMC/CMWSSB	Construction phase	Site Inspection by PMC, PIU officials.	No tree cutting Minimum vegetation loss; Number and species of trees cut and replanted; and Survival of number and species of trees planted.	Monthly

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		authority as applicable; Compensatory plantation for every tree cut by way of re-plantation at ten times the trees cut; Growth and survival of trees planted shall be ensured and monitoring should be conducted at least for 3 years. Survival rate of plants shall be reported to the CMWSSB on monthly basis; Contractor shall develop plantation program for the site; Greenbelt will be developed around the site.					
2.4.	Site preparation	Disturbance to land surface contours to be kept to minimum; Maintaining the natural drainage pattern existing onsite;	Contractor, PIU/PMC	Beginning of construction	Site inspection	Natural drainage maintained; and Minimum excavation for drainage	One time and periodically

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		Adequate drains and slopes to be laid across the proposed project site prior to start of excavation work to ensure adequate cross drainage; and Ensure that the earmarked operational area for laying of pipeline and pumping house is barricaded with specific access (entry and exit) points. Barricading of the earmarked sites, besides the safety, will limit the disturbances or construction impacts to the adjacent areas within the premises. Necessary precautions such as bracing / shoring in the trench will be provided for trenches of more than 1.2 m deep or as required based on site conditions.				and levelling	
2.5	Site Camp	Locate the suitable	Contractor,	Prior to start of	Review	Approved	Once

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		place for site camp at the start of civil works for the labours constructing sewer line/ pumping station at a place approved by the PIU; Provide water and/or other facilities at the site camp; Establish a suitable site office in portable cabin at the start of the civil works in the land provided at pumping station; and Designate the area beyond the boundary of the site as No-Go areas for all personnel on site. No vehicles, machinery, materials and people shall be permitted in the No-Go area at any time without the permission. Include the above in the LMP.	PIU/PMC	construction	approved site camp and site office layout; and Site inspection	site plan layout; and Area outside the site camp and site office designated as No-go area.	

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
2.6.	Barricading working site	Ensure that the construction site should be barricaded at all time with adequate marking, flags, reflectors etc. to isolate it from other operating areas; and Hard Barricade the pipeline route and identified construction areas at pumping station prior to construction activities.	Contractor	Prior to start of construction	Site inspection	Proper barricading in place; and Accident or casualty reported	One time
2.7	Water lines and drains	Adequate precautions should be taken while laying the sewer line to avoid the possibility of damage of existing water supply lines; and Avoid any damage to storm water drains	Contractor	During construction	Site inspection	Leakage of water	Regularly
2.8.	Stakeholder consultations	Under take detailed mapping and analysis of key stakeholders. Based on the stakeholder analysis, stakeholder engagement plan is prepared that will be updated as required;	Contractor/ PIU/PMC	Construction phase	Consultations with local communities, beneficiaries,potential temporary economic impacts and other	Awareness level of stakeholders, particularly the local communities, beneficiaries	Regularly

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		Ensure that stakeholder including impacted persons are consulted and made aware about the project's purpose, risks/ impacts, mitigation measures and time-frame; and Maintain the records and documentation of the procedure followed and the output of stakeholder engagement.			stakeholders	of the proposed sewage water supply; and Perception of local communities, Potential Temporary economic Impacts about the project and its impact and mitigation measures.	
2.9.	Traffic management	Route for use by construction traffic with in site to be planned with proper signage, flagman, barriers and safety to minimize encountering of workers with vehicles as per National Road Safety Policy 2010. Route for movement of heavy machinery shall be designated to avoid the soil compaction in	Contractor,PIU/ PMC	Construction phases	Review traffic management plan; and Site inspection	Implementation of traffic management plan adequately; Number of complaints received; and Incidence of accidents	

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		other areas; All vehicles deployed at site shall be certified for pollution under control (PUC), undertake regular maintenance of vehicles; Transportation of construction material will be generally scheduled in night when the traffic is minimum; Holding area shall be provided within the site for vehicles waiting to deliver loads at site to avoid queuing outside the site; Ensure that the vehicles follow speed norms of the traffic department; and Investigate and respond to complaints about traffic.					
2.10	Construction	Modern machineries such as JCBs, porclain,	Contractor, PIU/ PMC	Construction phase	Review the material	Noise level and working	

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
	material and machinery	road roller, etc. shall be used to increase work efficiency and minimize the construction period; Ensure that material transported is properly covered with Tarpaulin, etc. Schedule material deliveries after daylight hours; and Identify and repair minor leaks and prevent machineries/equipment failures.			procurement detail; and Site inspection	of heavy machineries in order; and Construction material and its transportation follow the norms.	
2.11.	Construction material storage	Ready mix concrete (RMC) will be outsourced and contractor shall identify designated covered area for storage of construction material such as pipeline fittings, etc. with proper marking and measures to avoid dust emissions; Construction material	Contractor, PIU/PMC	Construction phase	Site inspection; and Review the material record maintained.	Clean and organized storage site; and Incidence of injury in loading, unloading and handling the material.	Periodically

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		stored in open shall be covered in order to avoid wind-blown dust emissions; Ensure and maintain record of proper stacking, loading and unloading of material and provide sufficient space for the movement of heavy vehicles inside the yard; Ensure handling the construction material safely by the labour;					
2.12.	Construction works (concrete, Cement, etc.)	Use ready-mix concrete outsourced for the works on pumping station and lift station site and construction of machine holes and chambers to the maximum extent possible; and If required, ensure that cement is mixed on mortar boards and not directly on the ground unless unavoidable.	Contractor	Construction phase	Site inspection	Incidence of mixing concrete on working site; Visible concrete on site; and Contamination of water and soil.	Regularly

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
2.13.	Top soil protection	Topsoil removed prior to commencement of construction activities shall be stored (stockpile no higher than 2 meter) separately and reused for backfilling and landscape development with in the project area; Keep topsoil stockpiles in an area protected from the wind and water; Land disturbance shall be restricted to the footprint of the project components and remaining area will be kept undisturbed to the extent possible; Ensure suitable control of run-off during the construction phase to prevent erosion of topsoil on adjacent land and undeveloped portions of the site; and	Contractor, PIU/PMC	Construction phase	Site inspection; and Assessment of disturbed (project components construction area) and undisturbed area.	Incidence of erosion; Storage and uses of topsoil; and Topsoil erosion on adjacent land.	Regularly

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		All excavations should be closed at the earliest before the start of rainy season.					
2.14	Noise from vehicles and machineries	Servicing of all vehicles, machinery, power generating equipment shall be done regularly as per the manufacturer's guidelines and during routine servicing operations, the effectiveness of exhaust silencers will be checked and if found defective will be replaced; All machines to be used shall conform to the relevant Indian Standards (IS), will be free from patent defect, kept in good working order, properly maintained and inspected regularly; Acoustic enclosure measures will be provided during operation to reduce	Contractor, PIU/PMC	Construction phases	Review of monitoring records Random Noise measurements	Level of noise generated; and Number of registered complaints	Regularly

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		noise level of machinery and DG set; Construction activities shall be carried out in a planned manner restricting high noise generating construction activities only during daytime; Contractor will maintain the proper record for all the construction vehicles which shall have the valid fitness certificate, NOC, insurance, etc. Ensure noise level in the residential and industrial areas with in the permissible limit; Regular monitoring of noise shall be conducted at site during the operations of machines and equipment; and Technicians/mechanics working on noise generating machineries will use PPEs such as					

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		ear plug, muffler, etc.					
2.15.	Dust emissions	Avoid clearing of vegetation until absolutely necessary; Trucks carrying construction material shall be adequately covered with tarpaulin sheet to avoid the dust pollution and the material spillage; DG set shall have adequate stack height as per TNPCB requirement; Dust levels will be controlled, through spraying of water from water tankers fitted with pressurized fine spray; Maintain all generators, vehicles, vessels and other equipment in good working order to minimise exhaust fumes; and Locate soil stockpiles in sheltered areas where	Contractor	Construction phase	Site inspection; Incidence of dust plumes; and Review of dust emission control measures.	Emission from construction site; Incidence of dust plumes observed; Dust mitigation measures followed; and Number of complaints received.	Regularly

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		they are not exposed to the erosive effects of wind.					
2.16.	Air quality	Maintain all vehicles, DG sets/generator sand other equipment in good working condition to minimise GHG emission, exhaust fumes, etc.; Avoid excavation, handling and transport of materials which may generate dust under high wind conditions or when a visible dust plume is present; Water sprinkling, cover dumping and stockpiles of lose material with plastic sheets or nets, particularly in windy conditions should be used to reduce airborne dust at construction sites; and Prevent burning, fire, use of wood for cooking in the project sites to avoid air	Contractor	Construction phases	Site inspection; Incidence of air pollution; and Review of fuel emission control measures.	Fuel emission from vehicles; Air pollution mitigation measures followed; and Number of complaints received.	Regularly

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		contamination.					
2.17.	Under ground water	Contractor shall ensure that all vehicle / machinery and equipment operation, maintenance and refueling will be carried out in such a manner that spillage of fuels and lubricants will not contaminate the ground water. Workforce will be trained about environmental pollution aspect and activities should stop immediately and resume only when problem is resolved; and Faulty equipment, vehicles and other source of possible oil and lubricant contamination should be repaired on priority and must be kept in good condition all the time.	Contractor	Construction &operation phases	Site inspection; and Review of spillage control measures.	Fuel or lubricant spillage; and Underground water pollution mitigation measures followed.	Regularly
2.1	Protection	Contractor shall ensure	Contractor	Construction phases	Site	Fuel or	Regularly

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
8	of lakes/ water bodies	that all vehicle / machinery and equipment operation, maintenance and refueling will be carried out in such a manner that spillage of fuels and lubricants will not contaminate the water bodies and construction of pipe carrying bridges across Buckingham canal; Water bodies need to be cordoned off by using protective barriers such as green cloth and subsequently plantation; and In case of water logging, water will be pumped out during the construction of pipelines.			inspection; and Review of spillage control measures.	lubricant spillage; and water pollution mitigation measures followed.	
2.19	Protection of archaeological and heritage	Conduct training to impart knowledge and create awareness among the workers about the significance of archaeological, paleontological and	Contractor, PIU /PMC	Construction phases	Site inspection; and Actions taken by the workers, PIU and ASI.	Discovery of archaeological/ paleontological material; Level of	When occurrence of chance finding

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		geological aspects and the applicable Indian Treasure Trove Act, 1878; The fossils, coins, articles of value of antiquity, human skeletal and other remains or things might be exposed during construction activities. In such situation, stop the work, do not remove and damage any article; Inform the Convenor and concerned authority (Archaeological Survey of India) immediately to take-action per referred Act and recommence the work after receiving written permission; and also, prevent any type of impact on the cultural heritage, monument, etc.				awareness among workers; and Protection and reporting of identified material when discovered.	
2.20	Safety of workforce	Adequate precautions shall be taken to prevent the accidents	Contractor, PIU/PMC	Construction phases	Site inspection; and	Quantity and timely supply of	Everyday

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		from the machineries. All machines shall confirm to the relevant Indian Standards Code and shall be regularly inspected for its working condition; Where loose soil is met with, shoring and strutting shall be provided to avoid collapse of soil. Provide job specific safety induction training, including environmental awareness and ensure daily toolbox talk to workers at the working area; Ensure availability and mandatory use of PPEs at the site; Use of protective footwear and protective goggles by the workers involved in mixing of materials like cement, concrete etc. at pumping station;			Observation of workers with PPE and safety measures while working on work site.	PPEs; Awareness level about the use of PPEs; and Incidence of injury, accident, infirmity.	

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		Use of earplugs by the workers exposed to loud noise, and those engaged in crushing, compaction, concrete mixing operations; Ensure sufficient quantity of all PPEs, necessary safety appliances such as safety goggles, helmets, boots, safety belts, ear plugs, mask, etc. to workers and staffs; Adequate measures and care to be taken while approaching any open water bodies for construction of bridges. Ensure railing around such sites are intact and in good condition; and The contractor will comply with all the precautions as required for ensuring the safety of the workmen as per					

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		the International Labor Organization (ILO)and applicable laws of India and Tamil Nadu state as applicable.					
2.21	Work-zone safety Management	Temporary barricades shall be provided to delineate construction zone as well material stacking areas. The construction site and the labour facility shall be appropriately barricaded to prevent entry and accidental tress-passing of workers, staff and others into the construction sites. All operational areas shall be access controlled. Watch and ward facilities at all times shall be provided by the contractor. Proper retro reflective warning signage will be installed on the access road next to the construction site about movement of	Contractor, PIU/PMC	Construction phase	Site inspection	Availability of safety measures Absence of safety Incidents	Everyday

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		construction machinery and vehicles. In excavations for longitudinal surface road drains, culverts etc., a high visibility warning and retro reflective signage shall be displayed in vermicular language and English. Entry of unauthorized persons should be prevented. Excavations will be adequately barricaded and well lit – with signages /info boards. There shall be adequate lighting arrangement at night and adequate barricading to prevent mishaps after construction activity ceases for the day. A readily available first aid unit with necessary					

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		supplies, drinking water, resting shed, sanitation etc shall be made available in every work zone.					
2.22.	Exposure to electrical equipment	The Contractor shall take all required precautions to prevent danger from electrical equipment at pumping room, etc. and ensure that: No material will be so stacked or placed as to cause danger or inconvenience to any person or the public; All necessary fencing and lights will be provided in construction area; Deactivation and proper grounding of live power equipment and distribution lines to be ensured before initiating work; All energized electrical devices to be marked	Contractor, PIU/PMC	Construction phase	Site inspection; Observation of power supply system; and Electricity safety precaution taken by workers while working on work site.	Incidence of current shock, injury, electrocution	Daily

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		with warning signs. Use the symbol of danger as warning of high electricity voltage or current flow on cable boxes or where required to avoid any incidence of current shock or electrocution; and Provision of specialized electrical safety training to those workers working with or around exposed components of electric circuits.					
2.23.	Fire Safety	Ensure that no fires are permitted on or adjacent to site; Ensure that no smoking is permitted on the working site; Ensure that sufficient and certified fire fighting equipment are placed and maintained on the site; Equip all fuel stores and waste storage	Contractor	Project life cycle	Inspect Attendance register for fire fighting training conducted; and Observation of fire extinguishers and certificate at the sites.	Number of Fire incidents; Certified extinguishers in appropriate locations; and Workers knowledge to operate the fire	When required

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		areas with fire extinguishers; Ensure that all workforce and staff on site are aware of the location of firefighting equipment on the site; and Conduct training program on use of extinguishers, sand, etc for fire-fighting and ensure that they are trained in its operations.				extinguisher	
2.24	Emergency response to manage cyclone and other disaster conditions	Contractor shall ensure efficient communication system in place which will be required during occurrence of any natural hazard; Evacuation plan shall be in place for the site; Evacuation plan or route is displayed clearly through signs or picture at prominent places within the sites;	Contractor, PIU/ PMC	Project life cycle	Inspect attendance register for training program; and Inspect fire extinguishers and certificate	DMP in place; Communication system in existence; Display of evacuation route; Capacity of workers to manage; and	When required

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		Ensure effective coordination within the workforce and concerned departments and display contact number of concerned persons at prominent places; and Conduct training program and mock drills to workers to deal with the disaster situations due to occurrence of cyclones and tsunami.				Disaster and emergency situations	
2.25	Demolition of existing structures from proposed PS site	Prior to carrying out any building demolition, detailed building appraisal by means of surveys and appropriate assessments shall be carried out. In case of asbestos present in the buildings, specific measures for removal and disposal have to be taken and included in the site specific ESMPs	Contractor, PIU/PMC	Construction phases	Site Inspection; Review of waste management plan; disposal registers	Air quality, noise level;	When required

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		Hoarding and covered walkway is to be provided for protection of the public during the demolition of buildings since hoarding isolates the demolition site from the public, thus preventing unauthorized access and trespassing. Metal scaffolds shall be used for top-down demolition. Both bamboo scaffolds and metal scaffolds are considered acceptable provided that they are erected according to the Construction Sites (Safety) Regulations and the codes of practices on scaffolding safety. Concrete breaking, handling of debris and hauling process are main sources of dust from building demolition. Dust					

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		mitigation measures complying with the Air Pollution Control (Construction Dust) Regulations shall be adopted to minimize dust emissions. Silent type power mechanical equipment shall be used to reduce noise impact as much as practicable or possibilities of engaging man power with light dismantling tools with PPE are studied and engaged. Debris waste and other materials shall not be thrown, tipped or shot down from a height where they are liable to cause injury to any person on or near the site. Disposal of debris has to be controlled and to be reused in filling of low ground with due permissions from local					

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		authority. Wasted reinforcement will be handled as per the departmental procedure.					
2.26	Submission of updated environmental & social management plan (ESMP) / site environmental plan (SEP); ESMP implementation and reporting	The contractor to prepared project specific ESMP.	Contactor/ PMC	Project cycle	Review of reports and records	Compliance at the site	One-time / As and when need arises
Social aspect							
2.27	Compensation and Assistances to potential temporary economic impacts	Provide compensation and assistance to potential temporary economic impacts; Employ people of local communities for project works with a priority to potential temporary economic impacts	CMWSSB/PMC/Contractor	Construction Phase	Verify the disbursement of compensation and assistance; and Conduct consultation with local communities	Potential temporary economic impacts were compensated at replacement cost against the income	One time

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		based on their skills; Employ the potential temporary economic impacts, particularly willing women on priority in project related unskilled, semi-skilled and skilled works as applicable; Any social impacts identified needs to be mitigated as per ECSMF				loss	
2.28	Loss of access	The contractor shall ensure that access to connecting roads; market, residence and other places should not be blocked. In case, it is unavoidable, then alternate route should be provided to people. The community should be made aware about the diversion plan along with expected deadline for the completion of work. After completion of the work, the access should be restored as	Contractor	Construction	Visual inspection	Crossing/ access closed	Regularly

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		per original condition. The contractor is required to provide notice to the shop owners of the need to shift kiosk/wares displayed on ROW as soon as the work plan is ready with minimum 7 working days. No works can be commenced unless 100% shifted in sections ready for implementation.					
3.Decommissioning phase							
3.1	Site clearance and rehabilitation/ Post-construction clean-up	Remove all construction equipment, vehicles, surplus materials, site office facilities, temporary fencing, structures and other items from the project site including pumping stations and lifting stations; Clean up and remove any spills and contaminated soil in the appropriate manner;	Contractor	After completion of construction phase and operation phase	Site inspection; and Review of record of activities upon completion of construction phase and commissioning phase	Restoration of construction sites in original condition; and Sites are fully rehabilitated prior to commissioning of project	Weekly

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		Do not bury discarded materials on site or on any other land not designated for this purpose; The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and these shall be cleaned up. Level the disturbed area and restore to a condition resembling its natural profile; and Ensure site is fully clean and tidy before the exit and prior to its handover to the officer of CMWSSB and other authorized persons.					
4. Operation and Maintenance phase							
4.1	Odour nuisance during operation of Sewage lifting and	Strictly follow standard operating procedures / operational manual for operation and maintenance of lifting and pump stations	CMWSSB / Contractor	Operation and Maintenance phase	Odour control measures; monitoring of H2S and ammonia; site inspection	No odour is experience around the pumping station	Periodical

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
	pumping stations	Ensure that operating staff is properly trained, and have Clear understanding of odour issues Ensure that pumping cycles are properly followed; and there is no build-up of sewage beyond design volume in the wells Conduct monitoring (periodically at all operational pumping stations and lifting stations					
4.2	Workers exposure to toxic gases in sewers and hazardous material during sewer maintenance work	During cleaning/ maintenance operation, the sewer line will be adequately vented to ensure that no toxic or hazardous gases are present in the line. Ensure availability of PPE for maintenance workers. Follow safety and Emergency preparedness plan .	CMWSSB	Operation and Maintenance phase	Site inspection	Nil grievances/ incidents	Regularly

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
4.3	Occupational health harardous and safety	Use safety shoes or boots with non-slip soles, safety harnes Check electrical equipment for safety before use; verify that all electric cables are properly insulated; take faulty or suspect electrical equipment to a qualified electricity technician for testing and repair Wear safety goggles in all cases where the eyes may be exposed to dust, flying particles, or splashes of harmful liquids All workers should undergo periodic examinations by occupational physician to reveal early symptoms of possible chronic effects or allergies	CMWSSB	Operation and Maintenance phase	Site inspection, verification of registeres and availability of PPEs.	Monthly reporting of different types of PPE provided.	Regularly.
4.4	ESHS and Other risks	Sewer Lines: During O&M stage provide necessary ESHS training to the staff in sewer cleaning and maintenance.	CMWSSB/Contractor	Operation and Maintenance phase	Site inspection progress reporting (Monthly, Quarterly, Semi-annual,	No of training conducted. Type of PPE provided t the staff.	Regularly

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		Ensure availability of PPE for maintenance workers. Pumping stations/lift stations: During O&M stage provide necessary ESHS training to the staff in pumping stations in grit handling, maintenance of wells, pumping equipment, pipeline, etc., Ensure availability of PPE for maintenance workers. STP: During O&M stage provide necessary ESHS training to the staff in STP operations, handling of chemicals, chlorine, other consumables. Ensure availability of PPE for maintenance workers.			Annual)	Site inspection	
5	Contractors planning and reporting requirements						
5.1	Contractors reporting Reports	Preparation of Contrators ESMP/LMP/SEP/WMP/TMP/ESHS Plan and monthly complaint	Contractor	Pre construction/Implementation/O&M Phase	Review and approval of reports submitted by the contractor.	No of reports submitted and approved	One time/Continuous

S. No.	Aspect	Mitigation measures	Responsibility	Implementation phase	Monitoring method	Monitoring indicator	Frequency
		reports					

8.2 Monitoring and Evaluation

The E&S experts of the PMC will review the updatedESMP and sub-plans submitted by the contractor and will ensure that such plans are in line with the applicable laws and regulations. The experts will supervise the implementation of plans and will report on the E&S safeguard status and performance under the project. The internal monitoring reports will at minimum include, but may not be limited to the following:

- Reporting period and context;
- Summary of project status;
- Regulatory compliance;
- Institutional set up and manpower management status;
- Environmental, social, health and safety of workers and local communities;
- Implementation status of ESMP, SEP, WMP;
- Monitoring of waste disposal and management;
- Monitoring of environmental attributes (air, water, noise) and social mitigationmeasures (e.g. compensation to potential temporary economic impacts at replacement value);
- Complaints and grievances redressal; and
- Stakeholder engagement and community development activities.
- Labour Management

PMC will prepare the internal monitoring report and submit to the PIU every month, and PIU will submit monthly report to TNUIFSL. Accordingly, the required budget for monitoring will be made available during the construction and the budget for operation phase will be updated and allocated later. The PIU in consultation with Contractor and PMC will update the monitoring parameters, frequency and budget as appropriate. Details of schedule of activities are given in Table 26.

Table 27: Schedule of activities

S.No.	Schedule of activities	Responsibility	Time line
1	Obtain required permits and licenses	PIU/Contractor	Prior to Pre-construction
2	Designate the Convenor	PIU	Pre- construction
3	Constitute the GRC& disclose in all the project work sites and zonal offices.	PIU	Pre- construction
4	Mobilization of EHS officer	Contractor	Prior to construction
5	Mobilization of one environment expert	PMC	During construction
6	Mobilization of one social expert	PMC	During construction
7	Social – Revalidation Survey	PMC	Prior to start of work in the 6 potential temporary economic impacts identified stretches.

8.3Environment Monitoring Plan

To monitor the extent of environmental impact of the proposed project, the contractor has to periodically monitor the ambient environmental quality along the proposed project area. The monitoring requirement for the different environmental components is presented in table below:

Table 28: Stage wise Environmental Monitoring Plan

Project Stage: Construction Air Quality Monitoring

A	Parameter	PM10, PM2.5, SO2, NOx, CO and Pb
B	Sampling Method	Use method specified by CPCB for analysis
C	Standards	National Ambient Air Quality Standards 2009, Air (Prevention and Control of Pollution) Act,1981 Or relevant CPCB standards/guidelines
D	Frequency	Once every season except monsoon during construction period
E	Duration	As per CPCB guidelines for monitoring
F	Location	Sensitive locations, especially in the downwind direction along the network alignment.
G	Measures	Wherever air pollution parameters increase above specified standards, additional measures as decided by the engineer shall be adopted
H	Implementation	Contractor through approved monitoring agencies
I	Supervision	CMWSSB

Project Stage: Construction &operation AND maintenance -Water Quality Monitoring

A	Parameter	Parameters for Surface water quality standards (IS; 2296) Water pH, TDS, Total hardness, Sulphate, Fluorides, Chloride, Fe, Pb for groundwater.
B	Sampling Method	Grab sample to be collected and analysis as per Standard Methods for Examination of water and Wastewater.
C	Standards	Indian standards for Inland Surface Water (IS; 2296, 1982) and for Drinking water (IS; 10500,2012) Or relevant CPCB standards / guidelines
D	Frequency	Once every season during construction and during operation period.
E	Duration	--
F	Location	Suitable location within project area (preferable near PS, STP locations and receiving waterbody in the downstream of point of disposal)
G	Measures	At locations of variation in water quality/increased pollution, remedial measures to be adopted /all inflow channels shall be checked for pollution loads
H	Implementation	Contractor through approved monitoring agencies
I	Supervision	CMWSSB

Project Stage: Construction& Operation - Noise Level Monitoring

A	Parameter	Noise levels on dB (A) scale
B	Sampling Method	Free field at 1 m from the equipment whose noise level are being measured Equivalent noise levels using an integrated noise level meter kept at a distance of 15m from edge of pavement
C	Standards	National Ambient Air Quality Standards in respect of Noise, Noise Pollution (Regulation and Control) Rules, 2000
D	Frequency	Seasonal during construction period
E	Duration	Reading to be taken at 15 seconds interval for 15 minutes every hour and then average out for analysis
F	Location	Wherever the contractor decides to locate the equipment yard. At sensitive locations such as schools, hospitals etc along the alignment
G	Measures	In case of noise levels causing disturbance to the sensitive receptors,

		management measures as suggested in the ESMP shall be carried out.
H	Implementation	Contractor through approved monitoring agencies
I	Supervision	CMWSSB

Project Stage: OPERATION AND MAINTENANCE - Odour Level Monitoring

A	Parameter	H2S level within and next PS
B	Sampling Method	Use method specified by CPCB for analysis
C	Standards	National Ambient Air Quality Standards 2009, Air (Prevention and Control of Pollution) Act,1981 Or relevant CPCB standards/guidelines
D	Frequency	Half yearly (yearly twice) and as and when based on public complaints (throughout the operation phase)
E	Duration	As per CPCB guidelines for monitoring
F	Location	All LS / SPS and Terminal PS 3 points – at inlet , upwind direction of the asset and downwind direction of asset
G	Measures	Wherever H2S parameters increase above specified standards, additional measures as decided by the engineer shall be adopted
H	Implementation	Through approved monitoring agencies – Contractor (during Implementation) / CMWSSB (during O&M)
I	Supervision	CMWSSB

Project Stage: Construction & Operation - Soil Monitoring

A	Parameter	Soil quality parameters (Pb, SAR and Oil & Grease, monitoring silt for presence of toxic metals , etc,.)
B	Sampling Method	Sample of soil collected to be acidified and analysed using absorption Spectrophotometer
C	Standards	Threshold for each contaminated set by IRIS database of USEPA until national standards are promulgated
D	Frequency	During the pre-monsoon post monsoon seasons each year for the entire construction and operation phase
E	Duration	Grab sampling
F	Location	At sample locations in the receiving water bodies, at the places of dumping silt, excavated earth
G	Measures	At location of increased in pollution levels, source shall be identified and measures adopted.
H	Implementation	Contractor through approved monitoring agencies
I	Supervision	CMWSSB

8.4 Cost Estimate for Environmental Management Program

The estimated ESMP implementation cost comprises of EMP as well as Compensation for the social impacts. The indicative budget for ESMP is provided in the following table.

Table 29: Indicative budget for construction phase

A. ESMP cost as per ESIA

S.No.	E&S monitoring parameters	Frequency	Responsibility	Amount (INR in lakhs)
1	Organize meetings with line departments.	Bi-annual	PIU	To be quoted in Bill no. V of Volume III (BoQ)
2	Workshop on E&S safeguards and on-job training as identified.	Annually	PIU/PMC	
3	Use of IEC material and use of media channel to create public awareness on waste management	Regularly	PIU/PMC	
4	Consultations with stakeholders regularly	Regularly	PIU/PMC/ Contractor	
5	Meetings of GRC	Monthly	PIU	
6	Air quality monitoring	Quarterly	PMC/ Contractor	
7	Surface water quality monitoring	Quarterly	PMC/ Contractor	
8	Ground water quality monitoring	Quarterly	PMC/ Contractor	
9	Soil quality monitoring	Bi-annual	PMC/ Contractor	
10	Noise quality monitoring	Quarterly	PMC/ Contractor	
11	Wind speed and direction	Bi-annual	PMC/ Contractor	
12	Health camp, occupational health and prevention of Covid 19	Regularly	Contractor	
13	Compensation and assistance to potential temporary economic impacts & revalidation survey during project implementation.	One time* plus lump sum	PIU	
			Total	

CHAPTER-9 Stakeholder Engagement and Grievance Redressal Mechanism

Stakeholder engagement is an integral part of developing an understanding about the project and the associated risks and impacts as perceived by the public. It helps in planning and setting up priorities for project management. SEP has been prepared and is provided in Annexure 7

9.1 Introduction

Information on Public Consultation is given adequately to the Public by means of notice, personal contact, etc. As per the World Bank policy on access to information and disclosure, the proposed project attracts Public Hearing. Proceedings of the Public Hearing/Stake Holders Meeting conducted on 17/06/2023.

9.2 Process of Stakeholder Consultation

The Public Hearing was arranged by the Chennai Metropolitan Water Supply & Sewerage Board (CMWSSB). The concerned persons having plausible take in environment and social aspect were requested to attend the meeting. Wide canvassing has been made by issuing notices door to door and keeping displays. The minutes of public consultation are as follows. The following were present during public meeting.

i. Stakeholders (Sub-project area people)
ii. Officials
iii. Social Expert
iv. Counsellors
v. Members from Residential welfare association
vi. Consultants

Stake holder consultation started by EE, CMWSSB, explained the project details and listed out the street name in the respective areas.

9.3 Members present

General public, Representative of resident welfare association, NGO, Elected representatives including councilors besides concerned officials of CMWSSB, Chennaiwere present. The scanned attendance sheet is provided in Annexure 7

Table 30 Member present

Sl. No	Name	Designation
1.	S.Nandagopal	Zone 3, Chairman
2.	P.Karpagam	Superintending Engineer, CMWSSB
3.	R.Venkatesan	Area Engineer, CMWSSB
4.	P.Bagiyalakshmi	Area Engineer, CMWSSB

5.	N.Singaravelan	Executive Engineer, CMWSSB
6.	J.Lakshmi Devi	Executive Engineer, CMWSSB
7.	S.Karthic	Executive Engineer, CMWSSB
8.	S.Vijayalakshmi	Executive Engineer, CMWSSB
9.	M.Renuka Devi	Assistant Executive Engineer, CMWSSB
10.	D.R.Susmitha	Assistant Engineer, CMWSSB
11.	J.Asna Merryshia	Ward Councillor
12.	A.D. Nanthini	Social Expert
13.	R. Aadharsh Rajkumar	Environmental Engineer, Consultancy
14.	M.Rajarajan	President, TNHB Colony Residents Welfare Association
15.	R.S.Babu	General Secretary, Mathur MMDA Welfare Association

9.4 Welcome speech

Welcome speech is delivered by Superintending Engineer Mrs. P. Karpagam, CMWSSB, and Chennai. She briefed the project preparation and different proposals in her speech. After her speech Assistant Engineer (P&D) Miss. D.R. Susmitha B.E., also express her valuable suggestions.

9.5 information Dissemination

On behalf of consultant, Miss. D.R. Susmitha B.E., (Assistant Engineer, CMWSSB, Chennai) explained the objectives, scope and deliverable's pertaining to the consultancy assignment. He also explained broadly the current status of project. Dr. A.D. Nundinuy, Ph.D, Social Expert has explained broadly on people consideration and quarries. The views of stakeholders are also taken into consideration and all the points are incorporated in minutes of meeting.

9.6 Suggestion from the participant and action taken

Table 31 Suggestion form the participant and action taken

Sl. No	Name of person/ULB	Queries	Action to be taken by CMWSSB
1.	M. Jaheer Hussain/Puzhal	Information Board about the project contractor number and alternative number (Should be reachable) it is make precautions.	Action to implement in O&M period.
2.	M. Mustaq Hussan/gopal nagar, Vadaperumbakkam	In low lying area during rainy period Parvathipuram to Gopal Nagar. Please make sure to laying of pipe proper alignment.	Pre surveyed, and will implement at O&M period.
3.	Firoz Hatim/Vadaperumbakkam	We facing drainage issue, request to provide sewage line as soon as possible	

4.	Farhan/Gopal Nagar, Vadaperumbakkam	Before starting the project make sure the completion date is fixed. Make safety precaution. Make sure that road and Re-laid perfectly.	We provide safety measurement provision in ESIA and contractor provision.
5.	R. Visvanathan/ Perumal kovil street, Vadaperumbakkam	In my suggestion near Perumal temple not provide pumping station	

*Note: The public consultation documents and public suggestion documents were attached in the Annexure 7.

9.7 Minutes of Meeting

Minutes of the meeting of the Stakeholders Meeting for “Comprehensive Underground Sewerage Scheme” for the Puzal (17.06.2023, 3 A.M to 5 P.M Area III CMWSSB office,Madhavaram), Mathur, Vadaperumbakkam, Theeyambakkam ULB” held on 17.06.2023 11 A.Mto 01 P.M at Area-IICMWSSB, Mathur, Chennai.

9.8 Conclusion

Mrs. J. Lakshmi Devi (Executive Engineer, CMWSSB) concluded the meeting by thanking all the participants who have attended the meeting.

CHAPTER-10 Institutional and Implementation Mechanism

10.1 Implementation of proposed project and institutional arrangement

PIU

The Chief Engineer (CE) of CMWSSB supported by the concerned Superintending Engineer (SE) is overall responsible for the project management.

The Executive Engineer (EE) who will be responsible for coordination, supervision and management of all the activities related to the project. The Executive Engineer (EE) will be assisted by the Assistant Executive Engineer (AEE) and Assistant Engineer (AE).

PMC

The PMC will have Environmental and Social experts in place and supervise the implementation of the E&S safeguards, and report to PIU/ CMWSSB.

Contractor

Contractor will appoint EHS personnel who along with the Project Manager be responsible for implementation of Environmental and Social management plan and mitigation measures and submit the compliance report PIU. PIU will supervise activities of Environmental and social safeguards for ensuring adoption and compliance of ECSMF and report to TNUIFSL.

CHAPTER-11 Project Benefits

The sewerage project, in respect of which considerable public and social resources are being used, form a basic infrastructure for the country and an indisputable indicator of civilization and development. The works cover a number of substantial social needs and aim to improve the quality of life and to protect public health and the environment.

11.1 Upgrading the quality of life

The quality of life and the hygienic conditions in the areas where the system operates have already improved. The operation of the sewerage system has relieved these areas to a great extent from previous problems that were caused by the continuous emptying of cesspools. In the past, hotels and blocks of apartments were required to empty and maintain septic tanks and soak ways. The sewerage system provides a healthier and more appropriate way to manage liquid wastes.

11.2 Preserving the natural environment

Presently, all sewage waste is discharged in septic tanks and cesspits, resulting in the pollution of the ground water of the areas where such waste was discharged. Polluted waters then ended in the sea and caused various risks and other environmental problems. Though the areas under study are recently added in to CMA, substantial residential, commercial and industrial developments have already occurred in the obscene of the basic infrastructure such as Water supply and underground sewerage system. Implementation of comprehensive underground sewerage system would definitely enhance the natural environment. The wastewater treatment plant produces by-products such as treated bio solids and methane. Treated sludge is used as a soil-improving substance mainly for tree cultivations whilst methane is being used for electricity generation, covering part of the power, required to operate the plant.

11.3. Saving and processing waters

Water is a substantial natural resource for our country and it should be managed in the best possible manner. The tertiary treated effluent at the wastewater treatment plant can bereused for non-domestic purposes such as gardening, boilers, and floor washings at industries and also for agricultural and other purposes.

11.4. Economic development and tourism

The most significant advantage of the system is maintaining sustainable development, the protection of the environment and improvement of the quality of life, with a further impact on the development of tourism and the economy in general.

11.5.Standard of living

As a result of the above, the sewerage system contributes to further development and increase of the standard of living of the City. Considering all the above advantages, there is no doubt that if we all cooperate, ourselves and our children will enjoy a better quality of life in the years to come and that we will secure a better environment to the forthcoming generations.

Annexure 1: Environment, Climate Change and Social Screening Form

Project Details		
Sl. No	Components	Details
1	Project Objective and components	UGSS to Puzhal, Kathirvedu (Left out streets), Mathur, Vadaperumbakkam, Theeyambakkam.
2	Details of Alignment / Components (main components including construction activities)	Collection System length – 183.384Kms, No. of LS – 11 No. of SPS – 10 No. of HSCs - 18581
3	Location of the Project Sites (all sites including alignment of networks, other structures like pumping stations; offices, locations where treated waste water, sludge & C&D wastes will be disposed/reused directly, any other) Current Land use (Provide information for all sites involved in the project), any historic land use (related to heritage, or contamination) Site Survey No:/s (with ownership), Geographical coordinates of the site	Location of the project sites are Puzhal, Kathirvedu (Left out streets), Mathur, Vadaperumbakkam, Theeyambakkam. The collected sewage treated at 110 MLD Kodungaiyur STP and the treated effluent discharged into B' canal. The identified vacant lands are free from contamination such as municipal solid waste, and not related to any Historic, Heritage site.

Proposed Resource Use

Resource Use				
Sl. No	Proposed Resources	Area/ Quantity	Unit	Details
(i).	Land Area proposed to be used: Location wise (in sq km / sq m)	.	Km	The collection system length – 183.384 Km Pumping Main length – 30.57 Km Vacant land area – 1122 sq.m
(ii).	Estimated energy consumption for the project activities – Source wise	9060822	KWh	SPS (10) –9060822 KWh
(iii).	Estimated usage of water quantity for the project: Ground Water and Surface water?	4000	KL	

Baseline Environmental Conditions

Sl. No	Environmental Aspects	Yes	No	Details (mention distance to these features in meters/kilometres, and quantities in g/kg/T as applicable. Also mention if any project components is excluded / regulated based on location/activities as per National / State regulations & need permits/follow guidance)
1	Is the project site located on or adjacent to any of the following (Provide information for all sites and alignment of the project components/subcomponents, associated activities; mention distance to these features in meters/kilometres)			
i)	Critically Vulnerable Coastal Areas, Ecosensitive Areas		No	The location of the project area is 7 km away from the Bay of Bengal sea. There is no eco-sensitive or critically vulnerable area present near the project area.
ii)	Cultural Heritage site, Protected monuments		No	There is no cultural heritage near the project area.
iii)	Natural Forests / Protected Areas Is the project in an eco-sensitive or adjoining an eco-sensitive area or its demarcated buffers? If Yes, provide details.		No	There is no forest or protected area present near the project area.
iv)	Any other Wetlands/ Mangrove/ Estuarine Region?		No	There is no mangrove or other wet lands are present near the project site.

v)	Any Natural Habitat areas, areas with natural features such as the Coasts, Lakes/ other water bodies?	Yes		The CRZ area under this project in pipe carrying bridge over the kosasthaiyar river. The KSP/SPS-01 is nearer to Kosasthalaiyar River at 0.45 Km. The PZ/SPS-01 was present In near to Puzhal lake at 2kms. The PZ/LS-01 was present in near to Retteri Lake at 2kms. The Vadaperumbakkam pond nearer to VDP/SPS-02. The Periyathoppu Lake was present nearer to MT/SPS-03
vi)	Any other Sensitive Environmental Components?		No	There is no any other environmental sensitive components present in the project area.
vii)	Any Residences, schools, hospitals, sensitive receptors?	Yes		Little legend play school in near to KTV/LS-01 at towards 5kms. St. Elizabeth School and Government School, Mathur is near to MT/SPS-03. North Star Hospital nearer to MT/SPS-02.
viii)	Any culturally – socially important paths, areas/religious occupancies, sacred groves, burial grounds, tourist or pilgrim congregation areas, borders, etc?	Yes		KTV/LS-01, PZ/SPS-01 – Christian Church present in 3kms of pumping stations.
ix)	Any Drinking water source, upstream and downstream uses of rivers, etc which may be impacted by proposed discharge of treated sewage / sludge from water		No	There is no drinking water source is used for the disposal of the treated water. The

	supply or sewage treatment plant?			treated water from the STP is further treated at TTRO and supplied to industries.
x)	Any Low-lying areas prone to flooding/areas of Tidal Influence used as part of the Project or near the project components?		No	There is no low lying area for flooding in the project area. The overall project area doesn't lying CRZ zone, In one part kosasthaliyar river pipe carrying bridge carry a sewage through pipe.
xi)	Details of Surface water quality at intake point or Disposal point of treated sewage	Yes		Surface water samples were collected around the project area. The results are given in the Chapter 4 of this report.
xii)	Any areas affected by other disasters?	Yes		Chennai recorded the highest rainfall of 1000 mm in Jan 2015. Further in 2004 Tsunami, Chennai coast is one of the worst affected coastal area.
2	Groundwater: Is the site in Critical / Over Exploited condition?	Yes		The ground water is overexploited in Chennai area
3	Is the area disaster-prone? If yes; list all disaster zone categories applicable	Yes		The Chennai city is listed as medium vulnerable category prone to flood of disaster zone. The cause of flood is by heavy rainfall.
4	Describe the soil and vegetation on site	yes		The location is geologically classified in to sedimentary (alluvial) formation.
5	Is the site area and condition suitable for proposed development?	Yes		The project site area and condition are suitable for the construction of UGSS.

6	Describe existing pollution/contamination or degradation in the site(s)	yes		Baseline environmental moniroting was carried out for ambient air, noise, soil, surface and ground water. The results showed that noise level in area near the main road are above the permitable limit at night due to vehicular movements. Air quality and water quality parametes are under the limit of standards. The results of the environmental monitoring are shown in chapter 4.
7	Near Dams, Barrages		No	There is no dams and barrages near the project site.
8	Any other remark on baseline condition?		No	Execpt noise level at night in areas near the main roads are above the limit.

Anticipated Environmental Impacts: Impacts on Land, Geology and Soils

Sl. No	Impacts	Yes/ May create	No	Details (mention distance to these features in meters/kilometres, and quantities in g/kg/T as applicable. Also mention if any project components is excluded / regulated based on location/activities as per National / State regulations & need permits/follow guidance)
8.	Will the proposed project cause the following on Land / Soil?			
i)	Impact on Surrounding Environmental Conditions including Occupation on Low lying lands/flood plains		No	There is no impact on flood plains due to the product.

ii)	Substantial removal of Top Soil (mention area in sq.m)		No	Excavated earth shall be used for refilling of the pipeline. The excess soil from the LS and SPS construction site shall be used for land filling of the low lying area.
iii)	Any degradation of land / eco-systems expected due to the project?		No	There is no degradation of land or eco system involved in the project activity.
iv)	Loss or impacts on Cultural/heritage properties/precincts, features		No	There is no impacts on cultural heritage due to the construction of the project components.
v)	Does the project activity involve cutting and filling/ blasting etc?		No	There is no blasting activity involved in the project activity.
vi)	Will the project cause physical changes in the project area (e.g., changes to the topography) due to earth filling, excavation, earthwork or any other activity?		No	There is no physical changes in the project area due to the construction of the project components. Excavated earth shall be used for refilling of the pipeline. The excess soil from the LS and SPS construction site shall be used for land filling of the low lying area which shall not affect any physical changes.
vii)	Will the project involve any quarrying/ mining etc?		No	There is no quarrying or mining activity involved in the project.
viii	Will the project / any of its component contaminate or pollute the Land? (for example sludge, disposal of untreated sewage/bypass)		No	The project components shall not pollute the land. The collected sewage shall be treated by the exisiting STP. The treated water is used for agriculture purpose and sludge is dried and used as fertilizer.

ix)	Pre-existing contamination on site/s		No	There is no pre-existing contamination on the project sites.

Impacts on Water Environment

Sl.no	Impacts	Yes/ May Create	No	Details (mention distance to these features in meters/kilometres, and quantities in g/kg/T as applicable. Also mention if any project components is excluded / regulated based on location/activities as per National / State regulations & need permits/follow guidance)
9	Will the subproject or its components cause any of the following impact on Water sources (Quantity or Quality):			
i)	Will the activities proposed at the site(s) impact water quality (surface or underground) and water resource availability and use? Will this sub-project involve the dredging of water bodies, sea, canals, etc.	Yes		The proposed sewer network collect the sewage and pump to Kodungaiyur STP. The treated sewage water discharged in to the intake pond of existing tertiary treatment reverse osmosis (TTRO) plant. The reated water supplied to industries.
ii)	Impacts on Water Resources		No	There is no impact on water resources.
iii)	Pollution of Water bodies/ground water nearby or downstream		No	The reated water supplied to industries after TTRO treatement.
iv)	Will the project affect the River /cannel flow pattern, stream pattern or any other irrigation canal?		No	The project shall not affect the flow pattern of any river or stream.
v)	Will the project result in stagnation of water flow or pondage or weed growth due to increased pollution/siltation		No	The project shall not result in stagnation of water flow.

Impacts on Biodiversity and Host Communities

Sl.no	Environmental Impacts	Yes/ May Create	No	Details (mention distance to these features in meters/kilometres, and quantities in g/kg/T as applicable. Also mention if any project components is excluded / regulated Lsbased on location/activities as per National / State regulations & need permits/follow guidance)
10	Will the subproject or its components cause any of the following impacts on Biodiversity or the neighborhood			
i)	Will the project necessitates cutting of? Trees / Loss of Vegetation		No	There is no tree cutting activity involved.
ii)	Will the project result in Health & Safety Risks in the neighborhood including the release of toxic gases, accident risks		No	There is no health and safety risk in the neighbourhood due to the construction of the project components. The odour that may arise from the pumping station is controlled by odour control measures proposed at the pumping stations.
iii)	Potential risk of habitat fragmentation due to the clearing activities? (e.g. Hindrance to the local biodiversity like disturbing the migratory path of animals/ birds etc.)		No	There is no potential risk of habitat fragmentation due to the project activity.
iv)	Potential Noise and Light Pollution or disturbance to surrounding habitats/communities	Yes		During excavation, construction activity generates noise pollution to the nearby

Sl.no	Environmental Impacts	Yes/ May Create	No	Details (mention distance to these features in meters/kilometres, and quantities in g/kg/T as applicable. Also mention if any project components is excluded / regulated Lsbased on location/activities as per National / State regulations & need permits/follow guidance)
				residential area. Addressed through mitigation measures proposed in ESMP
v)	Potential disruption to common property, accessibility, traffic disruptions, conflicts or disruption to the local community within the subproject area?	yes		Utility cables, water pipe lines, TNEB lines, shall be disturbed during excavation of pipeline.

Impacts due to Storage and Wastes: Pollution and Hazards

Sl. No	Type	Yes	No	Details (mention distance to these features in meters/kilometres, and quantities in g/kg/T as applicable. Also mention if any project components is excluded / regulated based on location/activities as per National / State regulations & need permits/follow guidance)
11	Will the subproject or its components cause any impact due to storage of materials, wastes or pollution due to releases during various project activities			

Sl. No	Type	Yes	No	Details (mention distance to these features in meters/kilometres, and quantities in g/kg/T as applicable. Also mention if any project components is excluded / regulated based on location/activities as per National / State regulations & need permits/follow guidance)
i)	Will the project use or store dangerous substances (e.g., large quantities of hazardous chemicals/ materials like Chlorine, Diesel, Petroleum products; any other?		No	There is no storage of hazardous chemicals or materials like chlorine is involved in the project components.
ii)	Will the project produce solid or liquid wastes; including construction/demolition wastes (including dredging, de-weeding wastes, muck/silt, dust, sludge, C&D wastes, hazardous wastes (such as asbestos from existing network), e-wastes (from equipment)); polluted liquids?	Yes		Theunused OHT at site ofproposed pumping stations KSP/SPS-01, PZ/SPS-01, MT/SPS-01are demolished.Thesolid waste or the liquid waste from the demolition shall be disposed in an appropriate method as per ESMP.
iii)	Will the project cause or increase air pollution or odour nuisance?	Yes		During the operation phase of LS and SPS, may generate nuisance odour to the nearby residential area. To mitigate odor control measures are proposed in all LS & PS
iv)	Will the project generate or increase noise levels which will impact surrounding biodiversity or communities?		No	There is no noise generating components involved in the project activity.
v)	Will the project generate or increase visual blight or light pollution?		No	There is no light pollution due to the project.

Sl. No	Type	Yes	No	Details (mention distance to these features in meters/kilometres, and quantities in g/kg/T as applicable. Also mention if any project components is excluded / regulated based on location/activities as per National / State regulations & need permits/follow guidance)
vi)	Will the project cause water pollution? (of waterbodies/ groundwater)?		No	There is no water pollution due to the project.
vii)	Will the project involve dangerous construction activities which may be a safety concern to workers/ host communities		No	There is no dangerous construction involved in the project. Safety measures shall be followed at the deep excavation area.
viii	Is there a potential for release of toxic gases or accident risks (e.g. potential fire outbreaks)		No	There is no potential release of toxic gases from the project.
12	Describe any other features of the project that could influence the ambient environment		No	There is no air quality disturbance due to the project activity.

Baseline Climate Data		
13. Project Area Baseline Note: Please provide details for ULB and also site. Please provide quantitative information where relevant.		
i)	Agro climatic zone	North East Agro climatic zone
ii)	No of Water Bodies in the ULB area	Lake – 4 (Puzhal lake, Retteri lake, Vadaperumbakkam Pond, Periyathoppu Lake, Mathur)
iii)	Name of the River(s) in the ULB	Kosasthaiyar River in Kosappur
iv)	Proximity to River (kms)	2Kms
v)	Proximity to Sea (kms)	10 to 12 Kms

vi)	Proximity to hilly terrains (kms)	No
vii)	High Flood Level of the River	97.97 cm
viii)	Flooding Events (Years) (Based on historic data of extreme flood events and future projections based on available analysis)	In year 2005, project area continued to receive heavy rains, recording 241 mm in 24 hours on 28th October 2005, and 320 mm in 24 hours on 2nd December 2015.
ix)	Flooding hotspots in the ULB	No of flooding hotspots, attach map
x)	Available Water sources (Surface / ground)	Puzhal lake and Retteri lake, Vadaperumbakkam Lake, Periyathoppu Lake.
xii)	Groundwater Level and potential zone	2-5; phreatic zone
xiii)	Normal Temperature & long term average; trends in changes in temperature	Normal temperature is 26 degree c. Long term average temperature is 28 degree c.
xiv)	Rainfall trends & long term average	Long term average rainfall is 1200 mm.
xv)	Land Use	Proposed project sites are vacant land.
xvi)	% of Green Cover in the ULB area	6.50%
xvii)	% of Water Bodies/Rivers	4
xviii)	Seismic Zone	2
xix)	Coverage rain water harvesting structures (in %)	
	a) Residential	90%
	b) Commercial & Institutional	100%
	c) Government/ULB	100%
xx)	RWH in buildings – Mandating byelaws	Yes
xxi)	Frequency of drought in study area.	Number of drought year – 3

	Does the area face water scarcity? Please provide details.		Frequency - 4		
xxii)	Frequency and intensity of cyclones in study area.		1 or 2 severe cyclones every year		
14	Climate Change Impacts in project area				
(i)	Climate signal Please select the relevant signals	Climate hazard Please select the relevant hazards	Yes	No	Details
	☐ Sea level rise ☐ Frequency of tropical storms ☐ Intensity of tropical storms ☐ Higher precipitation amounts ☐ Shifting seasons ☐ Higher temperatures ☐ Less precipitation ☐ Lower temperatures ☐ Others	☐ Salt water intrusion	Yes		The saline water intrusion in project area is being caused by over-extraction of the groundwater. This causes the water pressure in the groundwater table to drop leading to the entry of the saline water from the sea which is 2 km away.
		☐ Flooding of the coast	Yes		The flood in the coastal area of Chennai was recorded in 2015 and 2021 due to extreme rainfall.
		☐ River flood	Yes		The Kosasthalaiyar river flood in was recorded in 2015 due to heavy rainfall.
		☐ Bank erosion (sea/river)	Yes		The coastal area in Chennai recorded a maximum erosion of -43 m/year.
		☐ Flash flood (heavy rain)	Yes		The flash flood was recorded in 2015 and 2021 with extreme rainfall.
		☐Landslides		No	There is no landslide prone area in the project area.
		☐ Forest/Bush fires		No	There is no forest or bush near the project area.
		☐ Water shortage/drought	Yes		Decrease in rainfall has contributed to the drop in water pressure and ground water level depletion.
		☐ Effects of heat		No	There is no heat effect at the project area.
		☐ Effects of cold		No	There is no heat effect at the project area.
		☐ Effects of winds	Yes		The project area is located near the shore. All the project components are designed to withstand the maximum wind pressure.

		☐ Effects of air quality		No	There is no major deviations or trend in the air quality at the project area.
		☐ Effects of storm surge	Yes		The project area is located near the shore. All the project components are designed to withstand the maximum lift pressure and wind pressure.
		☐ Soil quality/land degradation		No	There is no impact or change in the soil quality. The excavated soil shall be reused for filling.
		☐ Others		No	-
ii)	Energy consumption for the project? Will the project result in GHG emission?		Yes		99.63 KW amount of energy shall be consumed. The project components of LS and SPS contain the pump which uses the electricity and emit the GHG.
iii)	Will the project affect any other water or other user? (downstream intake points of Water Supply projects, downstream water use by people, animals; irrigation)			No	There no other affect due to the project.
iv)	Is the project located in exploited ground water block?		Yes		The project is located at the over exploited ground water block. This project will increase the ground water table by treating the sewage water.
v)	Is the project area vulnerable to temperature fluctuations and drought?			No	The project area is not vulnerable to temperature fluctuations and drought.
vi)	Is the site vulnerable to hazards such as Earthquakes, Landslides, Flooding, Storm surge, Severe wind damage, Fire, Explosion, Other (specify)			No	The project area is not vulnerable to earthquakes, landslides, fire, explosion. The project area is located near the shore and there shall be storm surge and flooding due to heavy rain.
vii)	Will the project result in generation of wastes / by-product?		Yes		The project generate the sludge. The treated sludge is used as a fertilizer and given for agriculture purpose to farmers.

viii)	Will the project impact the water resource availability (surface/ ground water) and use (effluent/sewage disposal, bypasses from STPs/PS, leachate, runoff, wastes deposition, erosion)		No	The project will not impact the water source availability.
ix)	Will the project cause flooding of adjoining low lying areas		No	The project will not cause flooding due to the project activity. During the failure of the LS and SPS may leads to flooding and this shall be controlled by stand by diesel generators and pumps.
(x)	Will the project impact water quality or quantity in natural/constructed Lakes, or ponds		No	The project will not impact the water source availability

Project Environmental Enhancement Measures

Sl.No	Enhancement Measures	Yes	No	Details
15	Has the subproject design considered environmental enhancement measures?			
i)	Energy conservation measures/ energy recovery options incorporated in subproject design? Quantify the reduction in CO2 emission from the sub-project.	Yes		VFD has been proposed for all SPS's and there will be 30-40% savings in energy consumption.
ii)	Has the project considered alternate /renewable energy?	Yes		The project considered saving of the energy cost per year using VFD starter in SPS/LS instead of using conventional starter.
iii)	Has the project considered waste minimization (waste reuse/recycle options/circular economy)	Yes		The treated water is proposed to utilise for existing TTRO plant at Kodungaiyur. The treated sludge shall be used as fertilizer and given to farmers.

iv)	Rainwater harvesting, water recycling and other water resource enhancement measures proposed in the project?	Yes		The rain water harvesting system is proposed at the construction sites of SPS.
v)	Does the project include measures for prevention of wastage of water resource?	Yes		The waste water is collected and treated. The treated water shall be used for various purpose such as TTRO.
vi)	What waterbody conservation/ drinking water source improvements/drought management options are being proposed?	Yes		This project will collecte the sewage water from the project area and treat the sewage water for reuse purpose. This project shall enhance the ground water table and prevent the water pollution by letting sewage in the environment.
vii)	Design Considerations for protection of project components from extreme events - flood, drought, other natural disasters	Yes		The project components are designed to meet the extreme events such as flood. The SPS/ LS are designed above the HFL and ground water lifting pressure is considered for the construction of project components during heavy flood.
viii)	Greenbelt development proposed for the project?			Green belt development is proposed at the construction sites of SPS and LS.
ix)	Is the sub-project including design elements to strengthen infrastructure resilience? If so what?	Yes		The subproject shall provide the better sanitation facility to the

				project area, improve the health status of the people in the locality, and provide aesthetic appearance to the city.
x)	Has the project considered nature-based solutions and if so what?	Yes		The collection pipeline is designed based on the gravity.
xi)	Is the sub-project combining infrastructure and nature-based solutions? If so how?		No	
xii)	What design considerations is the project including to mitigate heat island effect?	Yes		The latest technology is proposed for pumps and electrical items to save the energy.
xiii)	What design considerations is the project including to preserve and expand green cover?	Yes		The SPS are designed with the VFD over the conventional starter for energy saving and cost saving. Wherever possible Green belts are proposed in pumping stations.

Land Use, Resettlement, and/or Land Acquisition

Sl.no	Components	Yes	No	Details
1	Does the project involve acquisition of private land?		No	There is no acquisition of land for the project
2	Alienation of any type of Government land including that owned by Urban Local Body?		No	The land is owned by CMWSSB.
3	Clearance of encroachment from Government/ Local body Land?		No	The land is not under any encroachment, it is vacant land.
4	Clearance of squatters/hawkers from Government/ Local Body Land?		No	The land is owned by CMWSSB.
5	Number of structures, both authorized and/or unauthorized to be acquired/ cleared/		No	There is no acquisition of structures for the

				project.
6	Number of households to be displaced?		No	There is no displacement of houses for the project.
7	Village common properties to be alienated Pasture Land (acres) Acquisition / burial ground and others specify?		No	There is no acquisition of land for the project.
8	Existing land uses on and around the project area (e.g., community facilities, agriculture, tourism, private property) will be affected?		No	There is no community facility or agriculture activity is affected due to the project. The access to the property, houses shall be temporarily disturbed for a day or two due to excavation of road/street.
9	Will the project result in construction workers or other people moving into or having access to the area (for a long-time period and in large numbers compared to permanent residents)?		No	The local labours are given preference for the construction works.
10	Are financial compensation measures expected to be needed?		No	There is no financial compensation involved in the project.

Loss of Crops, Fruit Trees, Household Infrastructure and livelihood				
Sl.no	Components	Yes	No	Details
11	Will the project result in the permanent or temporary loss of the following?			
11.1	Crops?		No	The project activity shall not carry out at any agriculture land.
11.2	Fruit trees? Specify with numbers		No	There is no tree cutting involved due to the construction activity.
11.3	Petty Shops		No	There is no dislocation or temporary economic impact due to the project

				activity.
11.4	Vegetable/Fish/Meat vending		No	There is no dislocation or temporary economic impact due to the project activity.
11.5	Cycle repair shop		No	There is no dislocation or temporary economic impact due to the project activity.
11.6	Garage		No	There is no dislocation or temporary economic impact due to the project activity.
11.7	Tea stalls		No	There is no dislocation or temporary economic impact due to the project activity.
11.8	Grazing		No	There is no dislocation or temporary economic impact due to the project activity.
11.9	Loss of access to forest produce		No	There is no loss of vegetation or access to the forest produce due to the project activity.
11.10	Any others - specify		No	
Welfare, Employment, and Gender				
12	Is the project likely to provide local employment opportunities, including employment opportunities for women?	Yes		The local people shall get the employment during the construction of project components.
13	Is the project being planned with sufficient attention to local poverty alleviation objectives?	Yes		The construction of the project components may involve the local people as labours for the construction work. This will provide the opportunity of the employement for the local people and help their life to improve ecomonically.

14	Is the project being designed with sufficient local participation (including the participation of women) in the planning, design, and implementation process?		No	The project may involve the local people including women during the construction activity. But there is no local participation during the design and planning of the project.
Historical, Archaeological, or Cultural Heritage Sites				
15	Historical heritage site(s) require excavation near the same?		No	There is no heritage site required to excavate for this project.
16	Archaeological heritage site(s) require excavation near the same?		No	There is no archaeological site required to excavate for this project.
17	Cultural heritage site(s) require excavation near the same?		No	There is no cultural heritage site required to excavate for this project.
18	Graves or sacred locations require excavations near the same?		No	There is no graves or sacred site required to excavate for this project.
Tribal Population/Indigenous People				
19	Does this project involve acquisition / alienation of any land belonging to Tribal people?		No	There is no acquisition or alienation land for this project.
20	Will the project lead to displacement / other adverse impacts on tribal / indigenous peoples?		No	There is no displacement activity involved in the project.
Beneficiaries				
Sl.no	Components	Yes	No	Details
21	Population proposed to be benefitted by the proposed project	Approx. no.:		1,15,000
22	No. of Females proposed to be benefitted by the proposed project	Approx. no.:		62,000
23	Vulnerable households /population to be benefitted	Approx. no.:		40,000
24	No. of Families to be benefitted	Approx. no.:		19000

Date: _____

Signature and name of the Borrower

Authorised Signatory

Note: This Screening sheet must be completed for each of the proposed subproject along with the DPR and ESIA Report.

Indicative Enclosures:

1. Provide maps with the geographical location of the project; Google maps with project sites and project alignment
2. An appropriately scaled map clearly showing the project area and project sites with land use, existing buildings, infrastructure, vegetation, adjacent land use, utility lines, access roads and any planned construction, and
3. Any other information to describe the project, locations and possible impact as required.
4. Provide relevant maps on flooding hotspots, LULC, etc
5. Land details for the project sites with (i) extent available and required, (ii) location, (iii) survey numbers, (iv) FMB extract, (v) current land use, landuse classification (vi) land ownership, alienation/acquisition status, (vii) certificate giving availability of sites required for the project by the borrower, (viii) location photographs with Geo-co-ordinates of all project sites and alignment (start, end point).

Vulnerable PAPs are those living below poverty line, SC / ST families and women headed households, Widows, Physically Challenged persons; Elderly persons above the age of 60 years among the affected families.

Annexure 2: Land Details and Photographs of Proposed Pumping Station and Lift Station Sites

SL. No.	Location	LS / SPS	Coordinates	Location of Pumping Station	Survey No.	Classification	Ownership	Extent of land required (Sq. m)	Existing Land use on site	Remarks
	VADAPERUMBAKKAM - THEEYAMBAKKAM									
1	Lift Stations	ARY / LS-01	13°11'26.3"N 80°15'03.8"E	Perumal Koil Street	-	-	GCC	16 Sq.m	Existing OHT site	Road side
2	Lift Stations	ARY / LS-02	13°11'28.8"N 80°14'18.6"E	Perumal koil Street, Periyar Nagar	-	-	CMWSSB	80 Sq.m	Existing filter bed site	Under CMWSSB possession
3	Lift Stations	TY / LS-01	13°11'40.8"N 80°13'57.2"E	Pillayar Koil Street	-	-	GCC	16 Sq.m	Vacant land	Road side
4	Lift Stations	VDP / LS-01	13°10'30.9"N 80°12'55.0"E	Madhavaram Redhills Road	21	Gramanatham	CMWSSB	45 Sq.m	Existing Borewell cum OHT site	Under CMWSSB possession
5	Lift Stations	VDP / LS-02	13°10'53.5"N 80°13'22.6"E	Annai Nagar	-	-	GCC	16 Sq.m	Vacant land	Road side
6	Sub pumping Station	VDP / SPS-01	13°10'39.3"N 80°13'34.5"E	Samuel Nagar Burial Ground	201/33	Burial Ground	GCC	624 Sq.m	Burial ground	NOC obtained from GCC
7	Sub pumping Station	VDP / SPS-02	13°10'33.3"N 80°13'04.8"E	Perumal Koil Street	96/1	Gramanatham – Govt. Poramboke	Revenue	806 Sq.m	Vacant land	GO (Ms) No.267, dt. 17.07.2015 obtained from Revenue Dept
8	Sub pumping	CTM / SPS-01	13°10'51.8"N 80°13'4	Mariamman Koil Street, Chettimedu	19	Meikkal	Revenue	676 Sq.m	Vacant land	Enter upon permi

S L. N o.	Loca tion	LS / SPS	Coordi nates	Location of Pumping Station	Sur vey No.	Classifi cation	Owne rship	Exte nt of land requ ired (Sq. m)	Exis ting Lan d use on site	Rema rks
	Stati on		5.7"E							ssion obtain ed from Reven ue Dept
9	Lift Stati ons	KSP / LS-01	13°10'5 5.9"N 80°14'0 5.2"E	Sendrambakka mKosappur Road	-	-	GCC	16 Sq.m	Vaca nt land	Road side
1 0	Sub pum ping Stati on	KSP / SPS-01	13°11'2 3.0"N 80°14'1 9.0"E	Perumal Koil Street, Manali Kosappur Road	165	Grama natham	CMW SSB	378 Sq.m	Exist ing OHT site	Under CMW SSB posse ssion
	PUZHAL & KATHIRVEDU									
1 1	Lift Stati ons	PZ / LS-01	13°09'0 7.3"N 80°12'3 4.3"E	Service Road of Grant Northern Trunk (GNT)Road, near to Bus stop	-	-	GCC	16 Sq.m	Vaca nt land	Road side
1 2	Lift Stati ons	PZ / LS-02	13°09'5 0.1"N 80°12'5 9.4"E	Abinandha Street, Vegetarian Nagar	-	-	GCC	16 Sq.m	Vaca nt land	Road side
1 3	Lift Stati ons	PZ / LS-03	13°10'0 0.2"N 80°13'2 4.5"E	Madhavaram Redhills Road (Opp. To JK Mahal)	-	-	GCC	16 Sq.m	Vaca nt land	Road side
1 4	Lift Stati ons	KTV / LS-01	13°09'2 9.7"N 80°12'3 4.6"E	Gangadharan Street, near GCC Park	-	-	GCC	16 Sq.m	Vaca nt land	Road side
1 5	Sub pum ping Stati on	PZ / SPS-01	13°10'1 7.6"N 80°11'4 3.4"E	Kannappa Swamy Nagar 26th Street	443/ 2A2	-	CMW SSB	960 Sq.m	Exist ing OHT site	Under CMW SSB posse ssion
1 6	Sub pum ping Stati on	PZ / SPS-02	13°10'1 5.7"N 80°12'3 6.5"E	Dhanalakshmi Nagar 2nd Street	279	Kuttai	Reven ue	990 Sq.m	Vaca nt land	Letter for Land acquis ition has been sent to

S L. N o.	Loca tion	LS / SPS	Coordi nates	Location of Pumping Station	Sur vey No.	Classifi cation	Owne rship	Exte nt of land requ ired (Sq. m)	Exis ting Lan d use on site	Rema rks
										Reven ue Dept
17	Sub pum ping Stati on	PZ / SPS-03	13°09'5 0.1"N 80°12'5 9.4"E	Balaji Nagar 3rdMain Road (Opp. To Taluk Office)	120	Panchar	Reven ue	750 Sq.m	Vaca nt land	Enter upon permi ssion obtain ed from Reven ue Dept
	MATHUR									
18	Lift Stati ons	MT / LS-01	13°10'0 5.5"N 80°14'1 0.8"E	Manali Kosappur Road	-	-	GCC	16 Sq.m	Vaca nt land	Road side
19	Sub pum ping Stati on	MT / SPS-01	13°09'4 8.3"N 80°14'4 2.4"E	Manali Kosappur Road	136/ 2A1 (Part)	-	CPCL layout	375 Sq.m	OHT site	Under CMW SSB posse ssion
20	Sub pum ping Stati on	MT / SPS-02	13°10'4 0.2"N 80°15'0 6.5"E	Bharathi Nagar 3rd Street	68	-	CMW SSB	40 x 40 m	Vaca nt land	Under CMW SSB posse ssion
21	Sub pum ping Stati on	MT / SPS-03	13°10'0 2.9"N 80°15'0 0.4"E	MMDA 3rd Main Road	LP, S&S , MM DA-6/90	-	CMW SSB	31 x 25 m	Exist ing SPS site	Under CMW SSB posse ssion

Annexure 3: NOC obtained for Lands and FMB sketch for proposed Pumping Stations

பார்வை-1ன்படி, மேலாண்மை இயக்குநர், சென்னை குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியம் அவர்களின் கடிதத்தில், புழல் (பகுதி-2), வடபெரும்பாக்கம் மற்றும் தீயம்பாக்கம் (பகுதி-3) ஆகிய பகுதிகளில் கழிவுநீரேற்று நிலையம் அமைக்க தேர்வு செய்யப்பட்டுள்ள கீழ்கண்ட அட்டவணையில் குறிப்பிட்டுள்ள பெருநகர சென்னை மாநகராட்சியின் நிலத்தினை பாதாள சாக்கடை திட்டத்திற்கென கழிவுநீரேற்று நிலையம் அமைப்பதற்காக சென்னை குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியத்திற்கு நிலமாற்றம் செய்து தருமாறும், இணைந்த பாதாள சாக்கடை திட்டத்தினை செயல்படுத்த தடையின்மை சான்று வழங்குமாறு கேட்டுக்கொள்ளப்பட்டது.

வ. எண்	கிராமம்	இடம்	புல எண்	வகைப்பாடு	விஸ்தீரணம்	உரிமையாளர்
(1)	(2)	(3)	(4)	(5)	(6)	(8)
1	வடபெரும்பாக்கம்	சாமுவேல் நகர்	201/33	மயானம்	20 x 20 மீ	பெருநகர சென்னை மாநகராட்சி

அதனைத்தொடர்ந்து பார்வை-2ல் கண்டுள்ள மாவட்ட வருவாய் அலுவலர்/நிமஉது அவர்களின் கடிதத்தில், மேற்கண்ட நிலத்தினை நிலம் மற்றும் உடைமைத்துறை தனி வட்டாட்சியர், சார் ஆய்வாளர், சென்னை குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரிய அலுவலர்கள் மற்றும் மண்டலம்-2 அலுவலர்கள் ஆகியோரை 29.06.2018 அன்று காலை 11.00 மணிக்கு கூட்டுப்புலத்தணிக்கை மேற்கொள்ளுமாறும், மேலும் கூட்டுப்புலத்தணிக்கைக்குமுன் மேற்படி நிலங்களுக்கான உரிய ஆவணங்கள் மற்றும் விரிவான அறிக்கையினை இவ்வலுவலகத்திற்கு அனுப்புமாறு மண்டல அலுவலர்-2 அவர்களை கேட்டுக்கொள்ளப்பட்டது.

பார்வை-3ன்படி, தனி வட்டாட்சியர்/நிமஉ து அவர்களின் கூட்டுப்புலத்தணிக்கை குறிப்பில், மேற்படி புலங்களின் தணிக்கையில், மாதவரம் வட்டம், வடபெரும்பாக்கம் கிராமம், புல எண். 86/4, மயான வகைப்பாடு கொண்ட நிலம், மயானமாக பயன்பாட்டில் இல்லாமல் காலியாக புதர்கள் மண்டி உள்ளது என்றும், நிலத்தின் எப்பகுதியில் கழிவுநீரேற்று நிலையம் அமைய உள்ளது என்ற விவரத்தினை கேட்புத்துறையிடமிருந்து வரைபடம் பெற்றும், மண்டலத்திலிருந்து பரிந்துரையின் அடிப்படையில் நிலமாற்றம் செய்ய தடையின்மைச் சான்று வழங்கலாம் என தெரிவிக்கப்பட்டுள்ளது.

பார்வை-4ன்படி, மண்டல அலுவலர், மண்டலம்-2 அவர்களின் கடிதத்தில், கோட்டம்-17, வடபெரும்பாக்கம், சாமுவேல் நகர், புல எண். 201/33 கொண்ட மயானம் முழுவதும் பெருநகர சென்னை மாநகராட்சி பயன்பாட்டில் உள்ளதால், சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியத்திற்கு வழங்க இயலாது என தெரிவித்துள்ளார்.

பார்வை-5ன்படி, பெருநகர சென்னை மாநகராட்சி ஆணையர் அவர்களின் கடிதத்தில், அரசு முதன்மை செயலர், நகராட்சி நிர்வாகம் (ம) குடிநீர் வழங்கல் துறை அவர்களின் தலைமையில் நடைபெற்ற அனைத்துத்துறை கலந்தாய்வுக்கூட்டத்தில் (Inter-Departmental Meeting), சென்னை பெருநகர குடிநீர் வழங்கல் (ம) கழிவுநீரகற்று வாரியத்தால் கோரப்பட்டுள்ள மயான வகைப்பாடு நிலங்களின் நிலமாற்றம் சம்பந்தமான கோரிக்கைகளை திரும்பப்பெறுவதாக முடிவெடுக்கப்பட்டதாலும், மேற்படி மண்டல அலுவலர்-2 அவர்களின் அறிக்கையின் அடிப்படையிலும், மண்டலம்-2, கோட்டம்-17, வடபெரும்பாக்கம், சாமுவேல் நகர், புல எண்.201/33-ல் உள்ள மயானம் முழுவதும் பெருநகர சென்னை மாநகராட்சி பயன்பாட்டில் உள்ளதால், சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியத்திற்கு வழங்க இயலாத நிலை உள்ளது என மேலாண்மை இயக்குநர், சென்னை குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியம் அவர்களுக்கு தெரிவிக்கப்பட்டது.

அதனைத்தொடர்ந்து பார்வை-6ல் கண்டுள்ள மேற்பார்வை பொறியாளர் (P&D) சென்னை குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியம் அவர்களின் கடிதத்தில், மேற்படி கூட்டத்திற்கு பின்னர் வட்டார துணை ஆணையர் (வடக்கு) அவர்களிடம் சென்னை குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரிய அலுவலர்களால் நடத்தப்பட்ட பேச்சுவார்த்தையில், மேற்படி புலத்தில் வரைபடத்தில் குறிப்பிடப்பட்டுள்ளவாறு புல எண். 201/33, 34A அல்லது 201/34C, 34B, 35 ஆகிய நிலங்களில் தடையின்மை சான்று வழங்க உரிய நடவடிக்கை மேற்கொள்ளுமாறு மண்டல அலுவலர்-2 அவர்களுக்கு வட்டார துணை ஆணையர் (வடக்கு) அவர்களால் அறிவுறுத்தப்பட்டது எனவும், பாதாள சாக்கடை திட்டப்பணிகள் முடியும் தருவாயில் உள்ளதால், உடன் தடையின்மை சான்று வழங்குமாறு கேட்டுக்கொள்ளப்பட்டுள்ளது.

பார்வை-7ன்படி, மாவட்ட வருவாய் அலுவலர்/நிமஉது அவர்களின் கடிதங்களில், மேற்படி புலத்தில் வரைபடத்தில் குறிப்பிடப்பட்டுள்ளவாறு புல எண். 201/33, 34A அல்லது 201/34C, 34B, 35 ஆகிய நிலத்தினில் 20 x 20 சதுர மீட்டர் நிலத்தினை பாதாள சாக்கடை திட்டப்பணிகள் மேற்கொள்ள சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியத்திற்கு தடையின்மை சான்று வழங்குவது சம்பந்தமான குறிப்பான கருத்துரையினை (Specific Remarks) வட்டார துணை ஆணையர் (வடக்கு) அவர்களின் மூலமாக உடன் இவ்வலுவலகத்திற்கு அனுப்புமாறு மண்டல அலுவலர்-2 அவர்களை கேட்டுக்கொள்ளப்பட்டது.

பார்வை-8ன்படி, வட்டார துணை ஆணையர் (வடக்கு) அவர்களின் குறிப்பில், மேற்கண்டவாறு குறிப்பிட்டுள்ள இ. த்தினை நிலம் மற்றும் உடைமைத்துறை மூலம் சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியத்திற்கு ஒப்படைக்க தடையின்மை சான்று வழங்குவதற்கு அனுமதி வழங்கப்பட்டுள்ளது.

பார்வை-9ன்படி, சிறப்பு அதிகாரி, மன்றத்தீர்மானம் எண். 703/2021, நாள்:13.09.2021ன்படி, மேற்படி திட்டத்தை செயல்படுத்த அப்பகுதியில் வேறு அரசுக்கு சொந்தமான காலி நிலங்கள் ஏதும் இல்லாததாலும், அப்பகுதி மக்களின் பாதாள சாக்கடைக்கான அத்தியாவசியமான திட்டமாக இருப்பதாலும், அவசர அவசியம் கருதி மண்டலம்-2, கோட்டம்-17, வடபெரும்பாக்கம், சாமுவேல் நகர், புல எண். 201/33, 34Aல் அமைந்துள்ள மயான நிலத்தினில் 20x20 சதுர மீட்டர் நிலத்தினை பாதாள சாக்கடை திட்டப்பணிகள் மேற்கொள்ள சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியத்திற்கு தடையின்மை சான்று வழங்குவதற்கு சிறப்பு அதிகாரி, நிலைக்குழு வரிவிதிப்பு (ம) நிதி மூலமாக மன்றத்தின் அனுமதி வழங்கப்பட்டது.

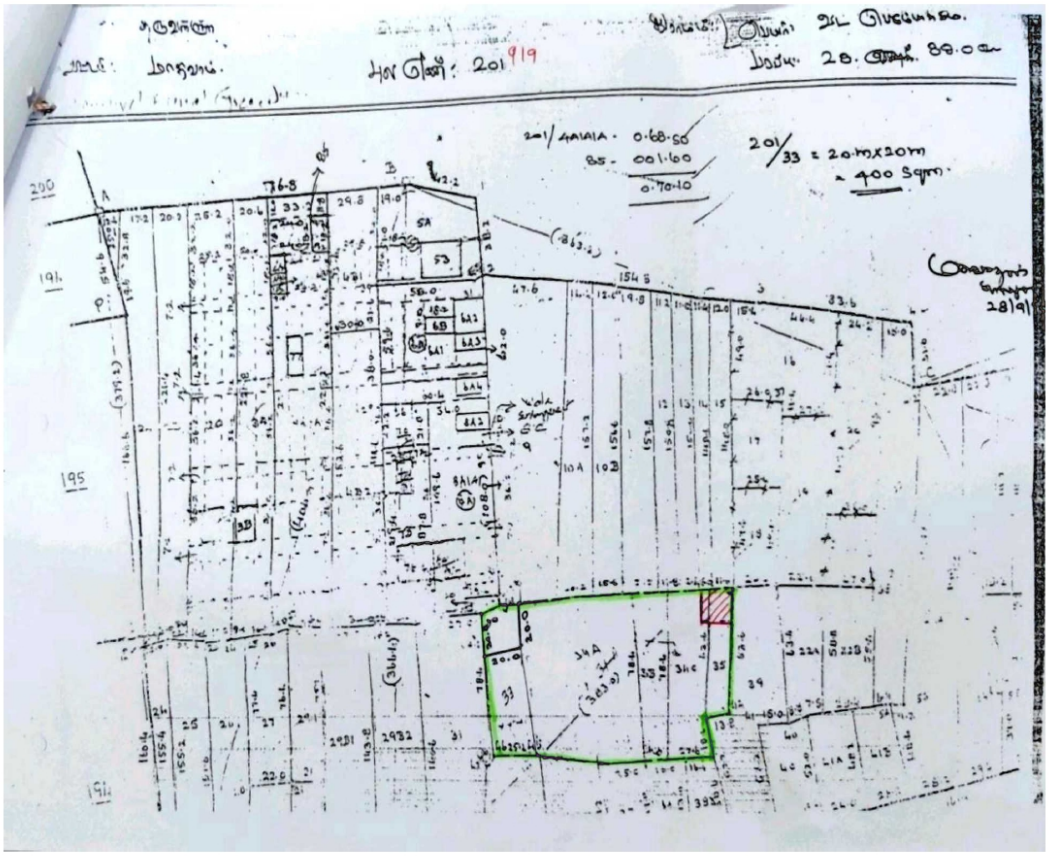
எனவே, இந்நேர்வில், மண்டலம்-2, கோட்டம்-17, வடபெரும்பாக்கம், சாமுவேல் நகர், புல எண். 201/33, 34Aல் அமைந்துள்ள மயான நிலத்தினில் 20x20 சதுர மீட்டர் நிலத்தினை பாதாள சாக்கடை திட்டப்பணிகள் மேற்கொள்ள சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியத்திற்கு இதன் மூலம் தடையின்மை சான்று வழங்கப்படுகிறது.

ஒம்/- விஷ்ணு மஹாஜன், நாள்:21.10.2021
துணை ஆணையர் (வருவாய் (ம) நிதி)

//உத்தரவின்படி//அனுப்பப்படுகிறது//

நகல்: மண்டல அலுவலர், மண்டலம்-2.

22.10.2021
தனி வட்டாட்சியர்/நிமஉது



Abstract

Land Alienation – Tiruvallur District – Madavaram Taluk – Vadaperumbakkam Village S.No.96/1 – 0.12.0 hectare out of 3.26.0 hectare – Classified as "Gramma Natham-Village Site-Government Poramboke" – Alienation of land in favour of Chennai Metropolitan Water Supply and Sewerage Board for the construction of Sewage Pumping Station - Orders Issued.

Revenue[LD5(2)] Department

G.O.(Ms) No.267 **Dated: 17.7.2015**

Read:-

1)From the District Revenue Officer, Tiruvallur Letter No.B1/20715/2012, dated 27.10.2014

2)From the Additional Chief Secretary / Commissioner of Land Administration letter No.B3/29663/2014, Dated: 03.12.2014.

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ORDER:

In the reference first read above, the District Revenue Officer, Tiruvallur has sent a land alienation proposal for an extent of 0.12.0 hectare of land out of 3.26.0 hectare, which is classified as "Gramma Natham-Government Poramboke" in S.No.96/1 in Vadaperumbakkam Village, Madavaram Taluk, Tiruvallur District in favour of Chennai Metropolitan Water Supply and Sewerage Board for the construction of Sewage Pumping Station.

2) In the reference second read above, the Additional Chief Secretary / Commissioner of Land Administration has stated that, the District Revenue Officer, Tiruvallur has reported as follows:-

a) On behalf of the Requisitioning agency, the Managing Director, Chennai Metropolitan Water Supply and Sewerage Board has given an application for allotment of land as per RSO 24 and an undertaking to abide the conditions that to be imposed by the Government.

b) The proposed land is classified as "Gramma Natham-Village Site" Government Poramboke.

c) The District Revenue Officer, Tiruvallur has inspected the proposed land on 11.10.2014 and reported that, the proposed land is about 10 feet depth from the ground level and it is free from encroachments. Adjacent to the proposed land, there is a Perumal Temple, Municipality building, park, houses and road exists. The vacant area of 0.12.0 hectare of land is proposed for alienation in favour of Chennai Metropolitan Water Supply and Sewerage Board and the same is recommended.

d) The "A1" Notice calling for objections had been published on 02.01.2014 and no objections received.

e) The VAO and Public Statements favouring the proposal have been received.

f) The prescribed questionnaire form part I to part VI have been filled and placed, in form part VII, the Tahsildar, Madavaram has recommended the proposal as against the specific recommendation of the District Collector / District Revenue Officer, Tiruvallur.

3) Regarding the fixation of land cost, the District Revenue Officer, Tiruvallur has informed that the Guide Line Value for the proposed land in S.No.96/1 is registered as Rs.300/- per Sq.ft. as on 01.04.2012. Hence, the land cost for the proposed land is calculated as below :-

Land value	=	Rs.1,30,680/-per cent.
Land value for proposed extent (i.e 0.12.0 or 0.30 x 1,30,680)	=	Rs.39,20,400/-
After adding 12% for the year 2013 &2014 works to	=	Rs.49,17,749.76/- or
Total	=	Rs.49,17,750/-

4) Finally, the District Revenue Officer, Tiruvallur has recommended the proposal for alienation of land to an extent of 0.12.0 hectare out of 3.26.0 hectare, which is classified as "Gramma Natham-Government Poramboke" in S.No. 96/1 in Vadaperumbakkam Village, Madavaram Taluk, Tiruvallur District in favour of Chennai Metropolitan Water Supply and Sewerage Board for the construction of Sewage Pumping Station.

5) The Additional Chief Secretary / Commissioner of Land Administration has also recommended the proposal of the District Revenue Officer, Tiruvallur for alienation of land to an extent of 0.12.0 hectare out of 3.26.0 hectare, which is classified as "Gramma Natham- Village Site -Government Poramboke" in S.No.96/1 in Vadaperumbakkam Village, Madavaram Taluk, Tiruvallur District in favour of Chennai Metropolitan Water Supply and Sewerage Board for the construction of Sewage Pumping Station, as per usual terms and conditions laid down under RSO 24, on free of land cost as per the G.O.(Ms) No.2272, Revenue Department, dated 6.12.1988 but on collection of other applicable charges.

6) The Government, after careful examination, have decided to accept the proposal of the District Revenue Officer, Tiruvallur as recommended by the Additional Chief Secretary / Commissioner of Land Administration, Chennai and accordingly order to alienate the land to an extent of 0.12.0 hectare out of 3.26.0 hectares of land, which is classified as "Gramma Natham-Village-Site Government Poramboke" in S.No. 96/1 in Vadaperumbakkam Village, Madavaram Taluk, Tiruvallur District in

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favour of Chennai Metropolitan Water Supply and Sewerage Board for the construction of Sewage Pumping Station, as per the conditions laid down under R.S.O.24, free of cost, as per the G.O.(Ms) No.2272, Revenue Department, dated 6.12.1988.

Conditions:-

a) The land should be used for the purpose for which it is alienated;

b) If the land or part of land is not used for the purpose for which it is alienated, the land should be remitted back to the Government in Revenue Department;

c) The requisitioning body should pay the sub-division fees, and stone value if any;

d) The requisitioning body should abide by the terms and conditions imposed by the Government if any in future.

7) The Additional Chief Secretary and Commissioner of Land Administration and the District Collector, Tiruvallur are requested to take further action as per the order issued in paragraph 6 above and the District Collector, Tiruvallur is also instructed to make necessary changes in the Revenue Records within a month.

(By order of the Governor)

R.Venkatesan
Secretary to Government

To
The Additional Chief Secretary and Commissioner of Land Administration,
Chepauk, Chennai-5.
The District Collector, Tiruvallur District, Tiruvallur.
The Managing Director, CMWSSB, Pumping Station Road, Chinthatripet, Chennai 2.
Copy to
The Municipal Administration and Water Supply Department, Chennai-9.
The Finance Department, Chennai-9.
The Special Personal Assistant to Hon'ble Minister (Revenue), Chennai-9.
The Personal Assistant to Secretary to Government, Revenue Department, Chennai-9.
SF/SC.

//Forwarded by Order//

Section Officer

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சென்னை மாவட்ட ஆட்சியர் அவர்களின் செயல்முறைகள்

முன்னிலை:திருமதி.R.சீத்தாலட்சுமி, இ.ஆ.ப.,

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ந.க. எண். 33987/2018/ ஜே16 நாள் : 22.11.2019

பொருள் : முன் நுழைவு அனுமதி - நிலம் நில உரிமை மாற்றம் - சென்னை மாவட்டம் - செட்டிமேடு கிராமம் - புஞ்சை தரிசு - புல எண்.19 மொத்த விஸ்தீரணம் 0.79.50 ஹெக்டேரில் 0.12.0 ஹெக்டேர் நிலத்தினை சென்னை குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியத்திற்கு நில உரிமை மாற்றம் செய்ய கோரியது - முன்நுழைவு அனுமதி வழங்குதல் - தொடர்பாக.

பார்வை:

1) மேலாண்மை இயக்குநர், சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவு நீரகற்று வாரியம் கடிதம் எண். CMWSSB/P&D/UGSS/Lands/ SPL/2018. நாள் 29.05.2018.
2) முந்தைய திருவள்ளூர் மாவட்ட ஆட்சியர் அலுவலக அலவலக கோப்பு எண். 1274ஆ/2013/ஆ1.
3) வட்டாட்சியர்,மாதவரம் வட்டம் அவர்களின் கடித எண். 2179/2018/ஆ1 நாள் 10.12.2018.
4) வருவாய் கோட்டாட்சியர், வட சென்னை கோட்டம், தண்டையார்பேட்டை ந.க. எண். 4897/2018/அ1 நாள் 11.12.2018.

ஆணை:

சென்னை மாவட்டம், மாதவரம் வட்டம், செட்டிமேடு கிராமத்தில் புஞ்சை தரிசு புல எண்.19-ல் மொத்த விஸ்தீரணம் 0.79.50 ஹெக்டேரில் 0.12.0 ஹெக்டேர் புஞ்சை தரிசு வகைபாடு கொண்ட நிலத்தினை சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவு நீரகற்று வாரியத்திற்கு நில உரிமை மாற்றம் செய்வது தொடர்பாக, பார்வை 4-ல் குறிப்பிடப்பட்டுள்ள வட சென்னை கோட்ட வருவாய் கோட்டாட்சியரிடமிருந்து பெறப்பட்ட பிரேரணை பரிசீலனை செய்யப்பட்டது.

சென்னை மாவட்டம், மாதவரம் வட்டம், செட்டிமேடு கிராமத்தில் சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவு நீரகற்று வாரியத்திற்கு நில உரிமை மாற்றம் செய்ய கோரியுள்ள புலம் கீழ்கண்ட விவரப்படி கிராம கணக்குகளில் தாக்கலாகி வருகிறது.

புல எண்	மொத்த விஸ்தீரணம் (ஹெக்டேர்)	நிலமாற்றம் செய்ய கோரிய விஸ்தீரணம் (ஹெக்டேர்)	வகைப்பாடு
19	0.79.50	0.12.0	தீர்வை ஏற்பட்ட புஞ்சை தரிசு

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மேற்படி புல எண்.19 மொத்த விஸ்தீரணம் 0.79.50 ஹெக்டேரில் 0.12.0 ஹெக்டேர் நிலத்தினை சென்னை பெருநகர் குடிநீர் வழங்கல் மற்றும் கழிவு நீரகற்று வாரியத்திற்கு நில உரிமை மாற்றம் செய்வது தொடர்பாக செட்டிமேடு கிராமத்தில் பொது விளம்பரம் மற்றும் அ1 நோட்டீஸ் ஆகியவை 20.11.2018 அன்று பிரசுரம் செய்யப்பட்டது. இதில் நிர்ணயம் செய்யப்பட்ட 15 நாட்களுக்கு எழுத்து மூலமாகவோ அல்லது நேரடியாகவோ யாதொரு ஆட்சேபனையும் வரப்பெறவில்லை.

தணிக்கைக்குறிப்பு

சென்னை மாவட்ட வருவாய் அலுவலர் அவர்கள் 31.12.2018 அன்று புலத்தணிக்கை செய்துள்ளார். நில உரிமை மாற்றம் செய்ய கோரியுள்ள புலமானது தற்போது ஆக்கிரமனம் ஏதுமின்றி காலியாக உள்ளது. மேற்படி புலத்தில் அரசு கட்டிடங்களோ, மத வழிப்பாட்டு தளங்களோ, மயானமோ அல்லது விலை உயர்ந்த மரங்களோ ஏதுமில்லை. புலத்தின் வழியே உயர் மற்றும் தாழ் மின்னழுத்த கம்பிகள் ஏதும் செல்லவில்லை. நில உரிமை மாற்றம் செய்ய உள்ள புலத்திற்கு வடக்கு பக்கம் தானிய லட்சுமி என்ற மனைப்பிரிவின் வழியாகவும், கிழக்கு பக்கம் ஊர் பொது வழியும் அணுகு பாதையாக உள்ளது. மேலும் வட்டாட்சியர், வருவாய் கோட்டாட்சியர் மற்றும் மாவட்ட வருவாய் அலுவலர் ஆகியோர் தங்கள் புலத்தணிக்கை குறிப்பில் மேற்படி புலம் 19 ஐ சுற்றிலும் சென்னை மாநகராட்சியால் சுற்றுச்சுவர் அமைக்கப்பட்டுள்ளது என தெரிவித்துள்ளனர்.

நில உரிமை மாற்றம் செய்ய கோரியுள்ள நிலத்திற்கு நில மதிப்பினை நிர்ணயம் செய்ய இணைய தளத்திலிருந்து பதிவிறக்கும் செய்யப்பட்ட தற்காலிக வழிகாட்டி மதிப்பு பதிவேட்டினை பரிசீலனை செய்யப்பட்டதில் மேற்படி செட்டிமேடு கிராமம் புல எண்.19-க்கு சதுர அடி 1-க்கு ரூ.335/- என மதிப்பு நிர்ணயம் செய்யப்பட்டுள்ளது. எனவே, நில உரிமை மாற்றம் செய்ய உத்தேசிக்கப்பட்டுள்ள நிலத்திற்கு கீழ்கண்டவாறு நில மதிப்பு நிர்ணயம் செய்யலாம்.

சதுர அடி 1-க்கு	ரூ.335 /-
12916 சதுரடி நிலம் (அல்லது) 0.12.0 ஏர்ஸ் நிலத்தில் மதிப்பு	12916 x 335/-
பிரஸ்தாப புலமான 12916 சதுரடி மதிப்பு	43,26,800/-

(ரூபாய் நாற்பத்தி மூன்று இலட்சத்து இருபத்தாறாயிரத்து எண்ணூறு மட்டும்)

805

சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவு நீர் அகற்று வாரியத்திற்கு கழிவு நீரகற்று நிலையம் அமைக்க செட்டிமேடு கிராமம், புல எண்.19 ஏற்றதாக இருக்கும். எனவே புல எண்.19 னை சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவுநீர் அகற்று வாரியத்திற்கு முறையான நில மாற்றத்தை வழங்குவதன் அவசியம் மற்றும் பொது நலன் கருதி, மாதவரம் வட்டாட்சியர் மற்றும் வட சென்னை கோட்டாட்சியர், ஆகியோரின் பரிந்துரையின் அடிப்படையிலும், சென்னை மாவட்ட வருவாய் அலுவலரின் புலத்தணிக்கை அடிப்படையிலும் முழுமையான நில மாற்ற பிரேரணையை நிலுவையில் வைத்து வருவாய் நிலை ஆணை எண்.24-ல் கண்டுள்ள நிபந்தனைகளுக்கு உட்பட்டு, சென்னை மாவட்டம், மாதவரம் வட்டம், செட்டிமேடு கிராமம், புல எண்.19, புஞ்சை தரிசு வகைப்பாடு மொத்த விஸ்தீரணம் 0.79.50 ஹெக்டேர் நிலத்தில் விஸ்தீரணம் 0.12.0 ஹெக்டேர் நிலத்தினை சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவு நீரகற்று வாரியத்திற்கு கழிவு நீரகற்று நிலையம் அமைக்க நுழைவு அனுமதி வழங்கி ஆணையிடப்படுகிறது.

ஒம்/- R.சித்தாலட்சுமி,
மாவட்ட ஆட்சியர்,
சென்னை மாவட்டம்.

பெறுநர்:
மேலாண்மை இயக்குநர்,
சென்னை குடிநீர் மற்றும் கழிவு நீர் அகற்றும் வாரியம்,
எண்.1, பம்பிங் ஸ்டேஷன் ரோடு,
சிந்தாதிரிப்பேட்டை,
சென்னை- 02.

நகல்:
1. அரசு கூடுதல் செயலர் மற்றும் நில நிர்வாக ஆணையர், சேப்பாக்கம், சென்னை-05.
2. வருவாய் கோட்டாட்சியர், வட சென்னை கோட்டம், தண்டையார்பேட்டை, சென்னை-81.
3. வட்டாட்சியர், மாதவரம் வட்டம், சென்னை-66.

//ஆணைப்படி//

மாவட்ட ஆட்சியருக்காக.

22.11.19

எண். 939
நாள் 6/12/19

Department of Revenue

e-Governance System for Land Administration and Collection

Login: Firka Surveyor District : Chennai, Taluk : Madhavaram, Firka : Madhavaram

அச்சுத்த நாள் : 18/Jan/2019

தமிழ்நாடு அரசு

வருவாய்த்துறை

அ - பதிவேடு

அலுவலக உபயோகத்திற்கு மட்டும்

மாவட்டம்	வட்டம்	கிராமம்
சென்னை(02)	மாதவரம் (15)	செட்டிமேடு (002)

உள்ளபுல எண்	உட்பிரிவு என்	பழைய புல உட்பிரிவு என்	பகுதி	அரசு - ரயத்துவாரி	நிலத்தின் வகை	பாசன ஆதாரம்	இரு போகமா	மண் வயணமும் ரகமும்	மண் தரம்	தீர்வை - ஹெக்		பரப்பு		மொத்த தீர்வை	
										ரு	பை	ஹெக்	ஏர்	ரு	பை
	19	-	19		அரசு	புஞ்சை			3-4	6	6	80	0	79.5	5	39
												மொத்தம்	0	79.5		

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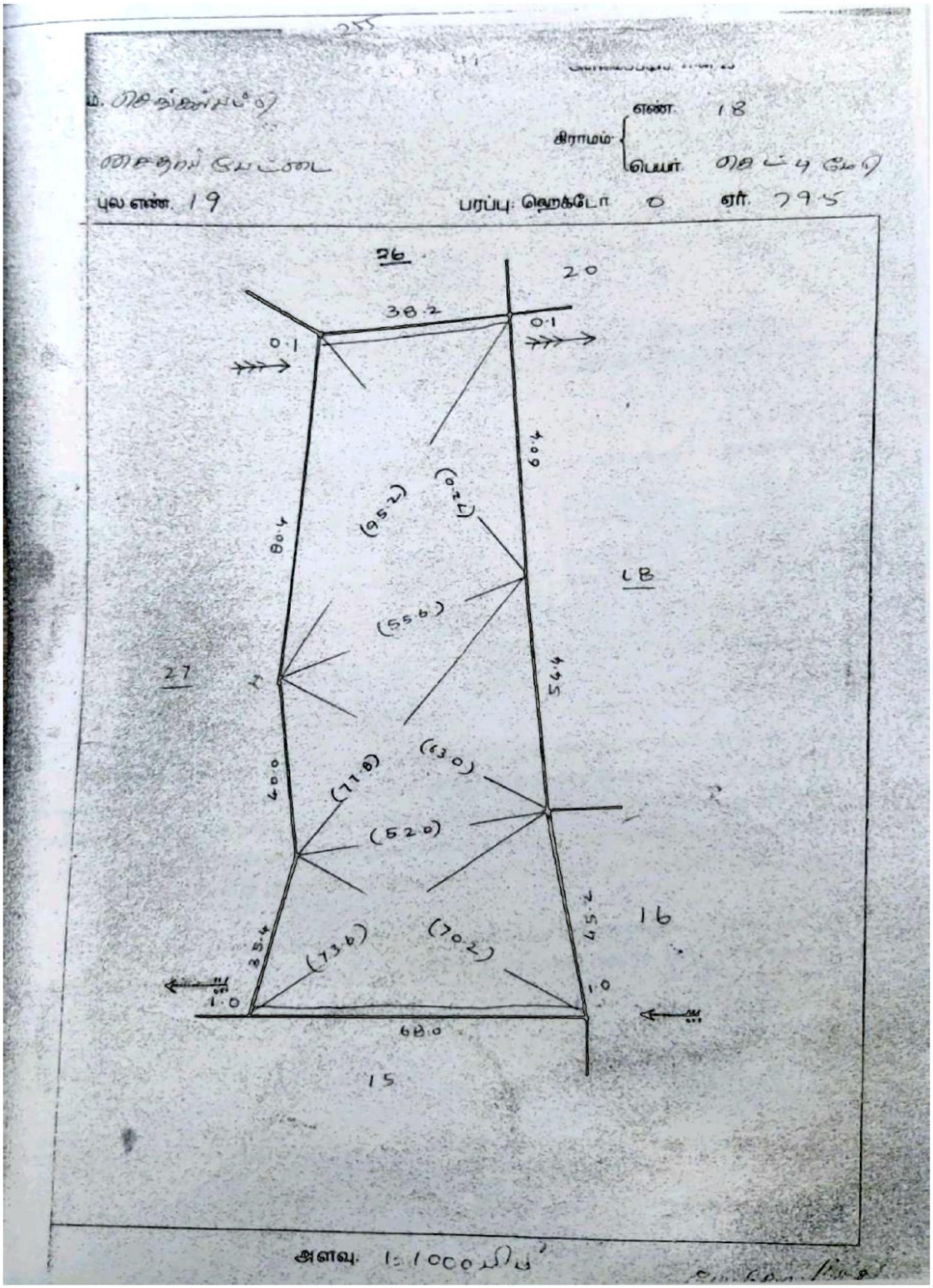


சென்னை மாவட்ட ஆட்சியர் அவர்களின் செயல்முறைகள்
முன்னிலை: திரு.அ. சண்முக சுந்தரம், இ.ஆ.ப.,

ந.க.எண். 32033/2018/ஜே16

நாள்:31.01.2019

பொருள்: முன் நுழைவு அனுமதி - சென்னை மாவட்டம் - மாதவரம் வட்டம் - எண்.21 புழல் கிராமம் - புல எண். 120 - மொத்த விஸ்தீரணம் 0.63.50 ஹெக்டேர்ஸ் - இல் விஸ்தீரணம் 0.09.00 ஹெக்டேர்ஸ் புஞ்சை தரிசு வகைபாடு கொண்ட நிலம் - சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவு நீரகற்று வாரியத்திற்கு நில உரிமை மாற்றம் செய்ய கோரியது - முன்நுழைவு அனுமதி வழங்கி உத்திரவிடுதல் - தொடர்பாக

படிக்க:
1. மேலாண்மை இயக்கநர் , சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழவு நீரகற்று வாரியம் கடித எண்: CMWSSB /P&D /UGSS /Lands /SPL /2018. நாள்: 29.05.2018.
2. முந்தைய திருவள்ளூர் மாவட்ட ஆட்சியர் அலுவலக கோப்பு எண்12748/2013/ஆ1.
3. வட்டாட்சியர், மாதவரம் வட்டம் அவர்களின் கடித எண்.2154/2018/B1. நாள்:12.11.2018.
4. வருவாய் கோட்டாட்சியர், வட சென்னை கோட்டம், தண்டையார்பேட்டை. ந.க.எண்: 4032/2018/அ1. நாள்: 30.11.2018.

ஆணை:

சென்னை மாவட்டம், மாதவரம் வட்டம், புழல் கிராமம், புல எண். 120 -இல் மொத்த விஸ்தீரணம் 0.63.50 ஹெக்டேர்ஸ் நிலத்தில் 0.09.00 ஹெக்டேர்ஸ் நிலத்தினை சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவு நீரகற்று வாரியத்திற்கு நில உரிமை மாற்றம் செய்ய கோரியது தொடர்பாக, பார்வை -4ல் காணும் கடிதத்தில் வருவாய் கோட்டாட்சியர், வட சென்னை கோட்டம் அவர்களிடமிருந்து பெறப்பட்ட பிரேரணை பரிசீலணை செய்யப்பட்டது.

சென்னை மாவட்டம், மாதவரம் வட்டம், புழல் கிராமம், புல எண். 239 -இல் விஸ்தீரணம் 0.09.00 ஹெக்டேர்ஸ் நிலத்தினை சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவு நீரகற்று வாரியத்திற்கு கழிவு நீரேற்று நிலையம் அமைக்க நில உரிமை மாற்றம் செய்ய கோரப்பட்டது. மேற்படி புலமானது புழல் கிராம கணக்குகளில் மாதவரம் வட்டாட்சியர் "அலுவலக வளாகம்" என தாக்கலாகியுள்ள காரணத்தால் கேட்பு துறையினருடன் கூட்டு புலத்தணிக்கை செய்யப்பட்டு புழல் கிராமம், புல எண்.239-ற்கு பதிலாக மேற்படி கிராமம் புல எண்.120 -இல் கழிவு நீரேற்று நிலையம் அமைக்க கேட்பு துறையால் முன் மொழிவுகள் அனுப்ப கோரப்பட்டது.

மேற்கண்ட புலத்தினை சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவு நீரகற்று வாரியத்திற்கு நில உரிமை மாற்றம் செய்வது தொடர்பாக கடந்த 08.10.2018 அன்று புழல்

காரியத்தில் மிகுது விளம்பரம் மற்றும் அ[illegible] செய்யப்பட்ட 15 நாட்களுக்குள் எழுத்து மூலமாகவோ அல்லது நேரடியாகவோ யாரி[illegible] ஆட்சேபனையும் வரப்பெறவில்லை .

துணிக்கைக்குறிப்பு:

மாவட்ட வருவாய் அலுவலர், சென்னை, அவர்களால் 12.12.2018 அன்று மேற்படி புலமானது புலத்தணிக்கை செய்யப்பட்டுள்ளது. பிரஸ்தாபப் புலத்தில் புராதான சின்னங்களோ விலை உயர்ந்த மரங்களோ அரசு கட்டிடங்களோ மத வழிபாட்டு தலங்களோ மற்றும் மயானமோ ஏதும் இல்லை. பிரஸ்தாபப் புலம் ஆக்கிரமணம் ஏதுமின்றி காலியாக உள்ளது. பிரஸ்தாபப் புலத்தையெட்டி சாலை அமைக்க MMRD- சார்பில் நிலம் கையகப்படுத்தப்பட்டுள்ளது. புலத்தின் அணுகு பாதையாக அதை பயன்படுத்தி கொள்ளலாம்.

சென்னை குடிநீர் மற்றும் கழிவு நீர் அகற்றும் வாரியத்தின் மூலம் கழிவு நீர் திட்டத்திற்காக கழிவு நீரேற்று நிலையம் அமைக்க புழல் கிராமம் ,புல எண:120 நிலம் ஏற்றதாக இருக்கும். எனவே, புல எண் 120 -னை சென்னை குடிநீர் மற்றும் கழிவுநீர் அகற்றும் வாரியத்திற்கு முறையான நிலஉரிமை மாற்றத்தை வழங்குவது குறித்த அவசியம் மற்றும் பொதுநலன் கருதி, மாதவரம் வட்டாட்சியர் மற்றும் வருவாய் கோட்டாட்சியர், வட சென்னை ஆகியோரின் பரிந்துரையின் அடிப்படையிலும், சென்னை மாவட்ட வருவாய் அலுவலரின் புலத்தணிக்கையின் அடிப்படையிலும், முழுமையான நில மாற்ற பிரேரணையை நிலுவையில் வைத்து வருவாய் நிலை ஆணை எண் 24-ல் கண்டுள்ள நிபந்தனைகளுக்கு உட்பட்டு **சென்னை மாவட்டம், மாதவரம் வட்டம், புழல் கிராமம், புல எண்.120, மொத்த விஸ்தீரணம் 0.63.50 ஹெக்டேர்ஸ் நிலத்தில் 0.09.00 ஹெக்டேர்ஸ் நிலத்தினை கழிவு நீரேற்று நிலையம் அமைக்க சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவு நீரகற்று வாரியத்திற்கு முன் நுழைவு அனுமதி வழங்கி ஆணையிடப்படுகிறது.**

ஒம்/- அ. சண்முகசுந்தரம்
மாவட்ட ஆட்சியர்,
சென்னை மாவட்டம்.

// ஆணைப்படி//

வட்டாட்சியர், "ஜே" பிரிவு

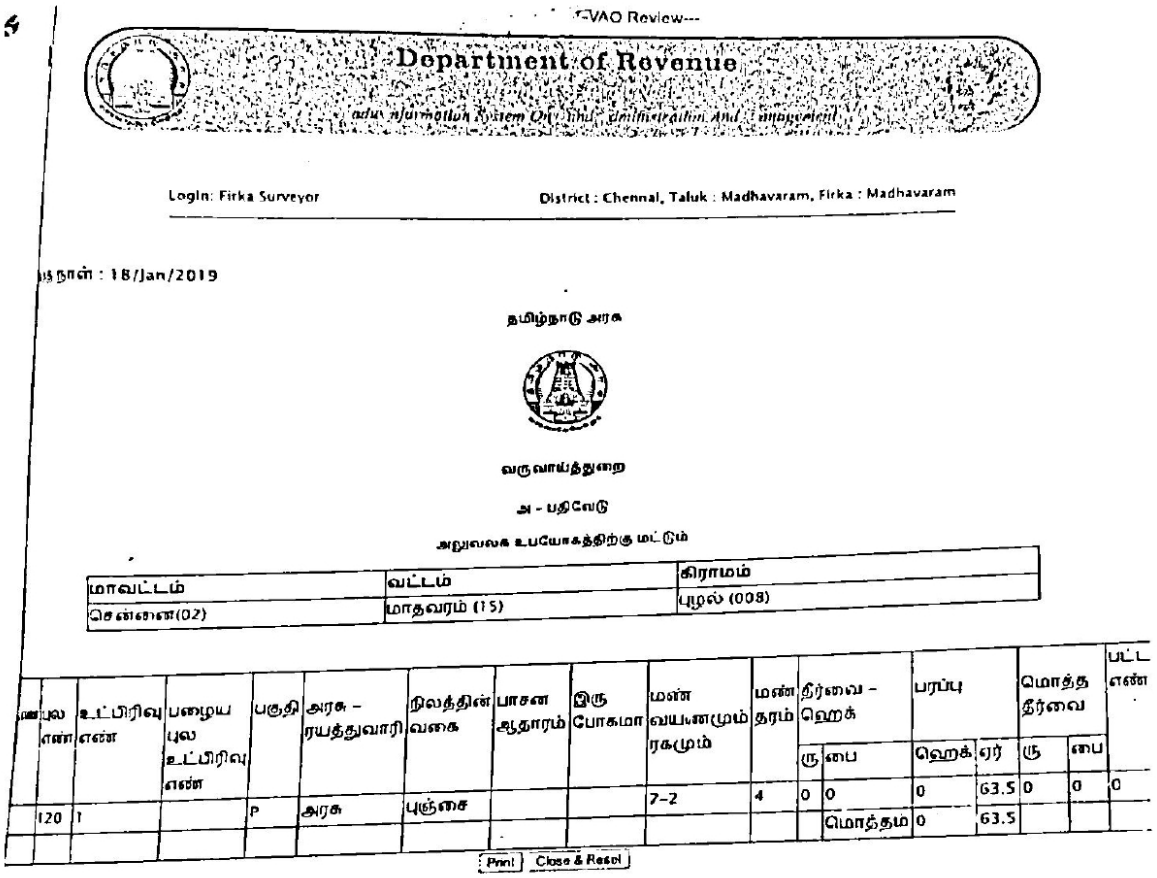
பெறுநர்:

1. மேலாண்மை இயக்குநர்,சென்னை குடிநீர் மற்றும் கழிவு நீர் அகற்றும் வாரியம், எண்.01 பம்பிங் ஸ்டேஷன் ரோடு,சிந்தாதிரிப்பேட்டை,சென்னை-02.

நகல்:

1. அரசு கூடுதல் செயலர் மற்றும் நில நிர்வாக ஆணையர், சேப்பாக்கம்,சென்னை-05.
2. வருவாய் கோட்டாட்சியர், வட சென்னை கோட்டம், தண்டையார்பேட்டை, சென்னை-81.
3. வட்டாட்சியர், மாதவரம் வட்டம், சென்னை-66

} அவர்களுக்கு தகவலுக்காக பணிந்தனுப்பப்படுகிறது.



VAO Review---

Department of Revenue

Login: Firka Surveyor

District : Chennai, Taluk : Madhavaram, Firka : Madhavaram

நாள் : 18/Jan/2019

தமிழ்நாடு அரசு

வருவாய்த்துறை

அ - பதிவேடு

அலுவலக உபயோகத்திற்கு மட்டும்

மாவட்டம்	வட்டம்	கிராமம்
சென்னை(02)	மாதவரம் (15)	புழல் (008)

புல எண்	உட்பிரிவு எண்	பழைய புல உட்பிரிவு எண்	பகுதி	அரசு - ரயத்துவாரி	நிலத்தின் வகை	பாசன ஆதாரம்	இரு போகமா	மண் வயபனமும் ரகமும்	மண் தரம்	தீர்வை - ஹெக்		பரப்பு		மொத்த தீர்வை		பட்ட எண்
										ரு	பை	ஹெக்	ஏர்	ரு	பை	
120	1		P	அரசு	புஞ்சை			7-2	4	0	0	0	63.5	0	0	0
											மொத்தம்	0	63.5			

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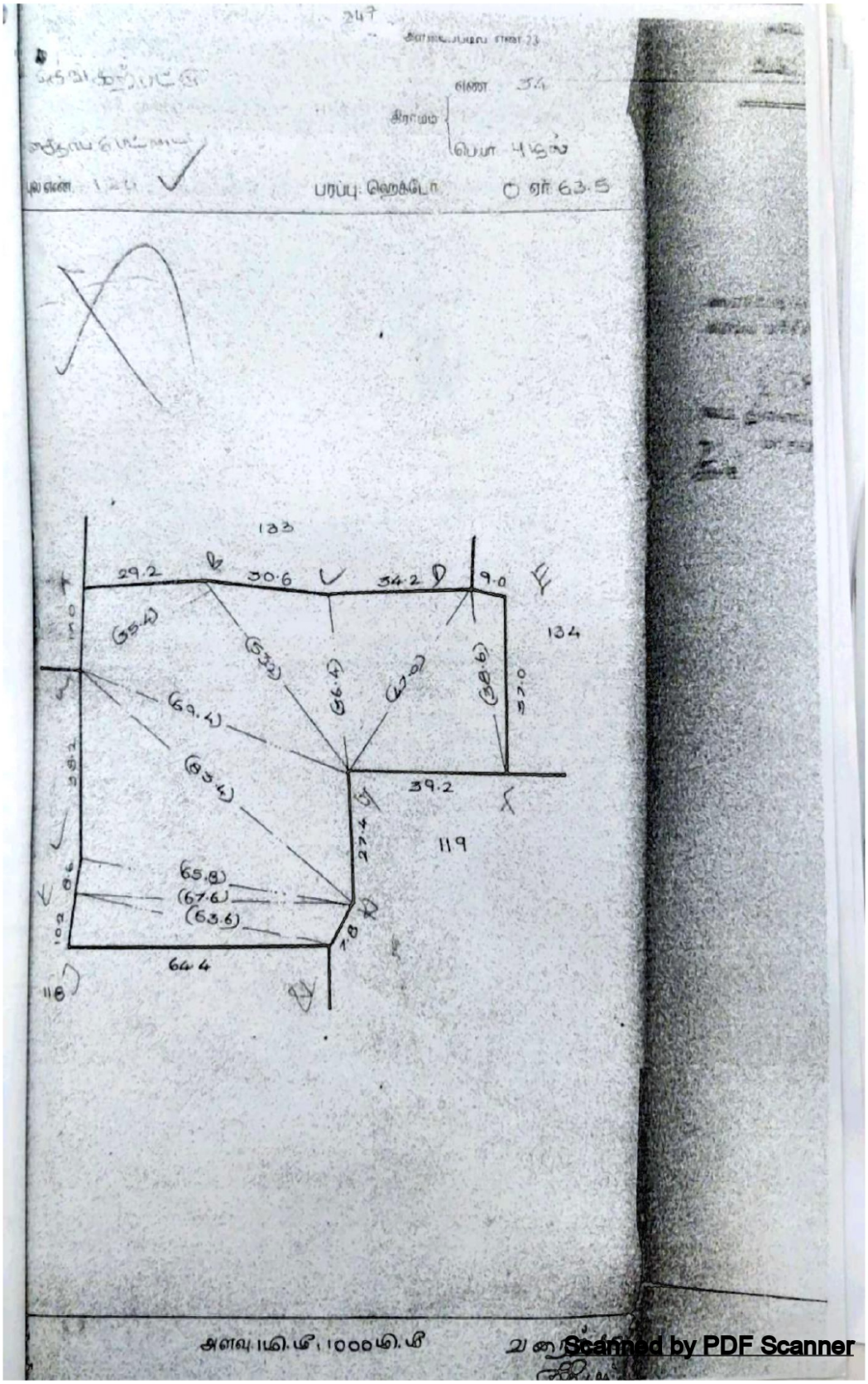
247
எண் 34
பெயர்
பரப்பு: ஹெக்டேர் ஏர் 63.5
133
29.2
30.6
34.2
9.0
134
(55.4)
(57.2)
(66.4)
(47.0)
(38.6)
37.0
(69.4)
(83.4)
39.2
27.4
119
(65.8)
(67.6)
(63.6)
64.4
118
அளவு 1மி.மீ. 1000மி.மீ
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அதனைத்தொடர்ந்து பார்வை-6ல் கண்டுள்ள மேற்பார்வை பொறியாளர் (P&D) சென்னை குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியம் அவர்களின் கடிதத்தில், மேற்படி கூட்டத்திற்கு பின்னர் வட்டார துணை ஆணையர் (வடக்கு) அவர்களிடம் சென்னை குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரிய அலுவலர்களால் நடத்தப்பட்ட பேச்சுவார்த்தையில், மேற்படி புலத்தில் வரைபடத்தில் குறிப்பிடப்பட்டுள்ளவாறு புல எண். 201/33, 34A அல்லது 201/34C, 34B, 35 ஆகிய நிலங்களில் தடையின்மை சான்று வழங்க உரிய நடவடிக்கை மேற்கொள்ளுமாறு மண்டல அலுவலர்-2 அவர்களுக்கு வட்டார துணை ஆணையர் (வடக்கு) அவர்களால் அறிவுறுத்தப்பட்டது எனவும், பாதாள சாக்கடை திட்டப்பணிகள் முடியும் தருவாயில் உள்ளதால், உடன் தடையின்மை சான்று வழங்குமாறு கேட்டுக்கொள்ளப்பட்டுள்ளது.

பார்வை-7ன்படி, மாவட்ட வருவாய் அலுவலர்/நிமஉது அவர்களின் கடிதங்களில், மேற்படி புலத்தில் வரைபடத்தில் குறிப்பிடப்பட்டுள்ளவாறு புல எண். 201/33, 34A அல்லது 201/34C, 34B, 35 ஆகிய நிலத்தினில் 20 x 20 சதுர மீட்டர் நிலத்தினை பாதாள சாக்கடை திட்டப்பணிகள் மேற்கொள்ள சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியத்திற்கு தடையின்மை சான்று வழங்குவது சம்பந்தமான குறிப்பான கருத்துரையினை (Specific Remarks) வட்டார துணை ஆணையர் (வடக்கு) அவர்களின் மூலமாக உடன் இவ்வலுவலகத்திற்கு அனுப்புமாறு மண்டல அலுவலர்-2 அவர்களை கேட்டுக்கொள்ளப்பட்டது.

பார்வை-8ன்படி, வட்டார துணை ஆணையர் (வடக்கு) அவர்களின் குறிப்பில், மேற்கண்டவாறு குறிப்பிட்டுள்ள இ. த்தினை நிலம் மற்றும் உடைமைத்துறை மூலம் சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியத்திற்கு ஒப்படைக்க தடையின்மை சான்று வழங்குவதற்கு அனுமதி வழங்கப்பட்டுள்ளது.

பார்வை-9ன்படி, சிறப்பு அதிகாரி, மன்றத்தீர்மானம் எண். 703/2021, நாள்:13.09.2021ன்படி, மேற்படி திட்டத்தை செயல்படுத்த அப்பகுதியில் வேறு அரசுக்கு சொந்தமான காலி நிலங்கள் ஏதும் இல்லாததாலும், அப்பகுதி மக்களின் பாதாள சாக்கடைக்கான அத்தியாவசியமான திட்டமாக இருப்பதாலும், அவசர அவசியம் கருதி மண்டலம்-2, கோட்டம்-17, வடபெரும்பாக்கம், சாமுவேல் நகர், புல எண். 201/33, 34Aல் அமைந்துள்ள மயான நிலத்தினில் 20x20 சதுர மீட்டர் நிலத்தினை பாதாள சாக்கடை திட்டப்பணிகள் மேற்கொள்ள சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியத்திற்கு தடையின்மை சான்று வழங்குவதற்கு சிறப்பு அதிகாரி, நிலைக்குழு வரிவிதிப்பு (ம) நிதி மூலமாக மன்றத்தின் அனுமதி வழங்கப்பட்டது.

எனவே, இந்நேர்வில், மண்டலம்-2, கோட்டம்-17, வடபெரும்பாக்கம், சாமுவேல் நகர், புல எண். 201/33, 34Aல் அமைந்துள்ள மயான நிலத்தினில் 20x20 சதுர மீட்டர் நிலத்தினை பாதாள சாக்கடை திட்டப்பணிகள் மேற்கொள்ள சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியத்திற்கு இதன் மூலம் தடையின்மை சான்று வழங்கப்படுகிறது.

ஒம்/- விஷ்ணு மஹாஜன், நாள்:21.10.2021
துணை ஆணையர் (வருவாய் (ம) நிதி)

//உத்தரவின்படி//அனுப்பப்படுகிறது//

நகல்: மண்டல அலுவலர், மண்டலம்-2.

தனி வட்டாட்சியர்/நிமஉது

பார்வை-1ன்படி, மேலாண்மை இயக்குநர், சென்னை குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியம் அவர்களின் கடிதத்தில், புழல் (பகுதி-2), வடபெரும்பாக்கம் மற்றும் தீயம்பாக்கம் (பகுதி-3) ஆகிய பகுதிகளில் கழிவுநீரேற்று நிலையம் அமைக்க தேர்வு செய்யப்பட்டுள்ள கீழ்கண்ட அட்டவணையில் குறிப்பிட்டுள்ள பெருநகர சென்னை மாநகராட்சியின் நிலத்தினை பாதாள சாக்கடை திட்டத்திற்கென கழிவுநீரேற்று நிலையம் அமைப்பதற்காக சென்னை குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியத்திற்கு நிலமாற்றம் செய்து தருமாறும், இணைந்த பாதாள சாக்கடை திட்டத்தினை செயல்படுத்த தடையின்மை சான்று வழங்குமாறு கேட்டுக்கொள்ளப்பட்டது.

வ. எண்	கிராமம்	இடம்	புல எண்	வகைப்பாடு	விஸ்தீரணம்	உரிமையாளர்
(1)	(2)	(3)	(4)	(5)	(6)	(8)
1	வடபெரும்பாக்கம்	சாமுவேல் நகர்	201/33	மயானம்	20 x 20 மீ	பெருநகர சென்னை மாநகராட்சி

அதனைத்தொடர்ந்து பார்வை-2ல் கண்டுள்ள மாவட்ட வருவாய் அலுவலர்/நிமஉது அவர்களின் கடிதத்தில், மேற்கண்ட நிலத்தினை நிலம் மற்றும் உடைமைத்துறை தனி வட்டாட்சியர், சார் ஆய்வாளர், சென்னை குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரிய அலுவலர்கள் மற்றும் மண்டலம்-2 அலுவலர்கள் ஆகியோரை 29.06.2018 அன்று காலை 11.00 மணிக்கு கூட்டுப்புலத்தணிக்கை மேற்கொள்ளுமாறும், மேலும் கூட்டுப்புலத்தணிக்கைக்குமுன் மேற்படி நிலங்களுக்கான உரிய ஆவணங்கள் மற்றும் விரிவான அறிக்கையினை இவ்வலுவலகத்திற்கு அனுப்புமாறு மண்டல அலுவலர்-2 அவர்களை கேட்டுக்கொள்ளப்பட்டது.

பார்வை-3ன்படி, தனி வட்டாட்சியர்/நிமஉ அவர்களின் கூட்டுப்புலத்தணிக்கை குறிப்பில், மேற்படி புலங்களின் தணிக்கையில், மாதவரம் வட்டம், வடபெரும்பாக்கம் கிராமம், புல எண். 86/4, மயான வகைப்பாடு கொண்ட நிலம், மயானமாக பயன்பாட்டில் இல்லாமல் காலியாக புதர்கள் மண்டி உள்ளது என்றும், நிலத்தின் சிறுபகுதியில் கழிவுநீரேற்று நிலையம் அமைய உள்ளது என்ற விவரத்தினை கேட்புத்துறையிடமிருந்து வரைபடம் பெற்றும், மண்டலத்திலிருந்து பரிந்துரையின் அடிப்படையில் நிலமாற்றம் செய்ய தடையின்மைச் சான்று வழங்கலாம் என தெரிவிக்கப்பட்டுள்ளது.

பார்வை-4ன்படி, மண்டல அலுவலர், மண்டலம்-2 அவர்களின் கடிதத்தில், கோட்டம்-17, வடபெரும்பாக்கம், சாமுவேல் நகர், புல எண். 201/33 கொண்ட மயானம் முழுவதும் பெருநகர சென்னை மாநகராட்சி பயன்பாட்டில் உள்ளதால், சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியத்திற்கு வழங்க இயலாது என தெரிவித்துள்ளார்.

பார்வை-5ன்படி, பெருநகர சென்னை மாநகராட்சி ஆணையர் அவர்களின் கடிதத்தில், அரசு முதன்மை செயலர், நகராட்சி நிர்வாகம் (ம) குடிநீர் வழங்கல் துறை அவர்களின் தலைமையில் நடைபெற்ற அனைத்துத்துறை கலந்தாய்வுக்கூட்டத்தில் (Inter-Departmental Meeting), சென்னை பெருநகர குடிநீர் வழங்கல் (ம) கழிவுநீரகற்று வாரியத்தால் கோரப்பட்டுள்ள மயான வகைப்பாடு நிலங்களின் நிலமாற்றம் சம்பந்தமான கோரிக்கைகளை திரும்பப்பெறுவதாக முடிவெடுக்கப்பட்டதாலும், மேற்படி மண்டல அலுவலர்-2 அவர்களின் அறிக்கையின் அடிப்படையிலும், மண்டலம்-2, கோட்டம்-17, வடபெரும்பாக்கம், சாமுவேல் நகர், புல எண்.201/33-ல் உள்ள மயானம் முழுவதும் பெருநகர சென்னை மாநகராட்சி பயன்பாட்டில் உள்ளதால், சென்னை பெருநகர குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியத்திற்கு வழங்க இயலாத நிலை உள்ளது என மேலாண்மை இயக்குநர், சென்னை குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியம் அவர்களுக்கு தெரிவிக்கப்பட்டது.

Annexure 4: Public Information Notice Template

Public Announcement
Providing Underground Sewerage System to Left Out area of Puzhal, Kathirvedu (Left out streets), Mathur, Vadaperumbakkam, Theeyambakkam.

Under this project, works are being conducted by xxxx Contractor to provide sewerage network in Puzhal, Kathirvedu, Mathur, Vadaperumbakkam, Theeyambakkam in Greater Chennai Corporation.

As part of this, works for laying pipeline / sewerage network will be taken up in -------- road---/ street/ lane ……. From……to (provide dates).

We request you to kindly co-operate for smooth implementation of the works.

We also request you to drive vehicles / pedestrians to walk carefully

Inconvenience caused is regretted.

PIU - Contact No.
Contractor – Contact no.

Annexure 5: Sample Grievance Registration Form

(To be available in Tamil and English)

The _____Project welcomes complaints, suggestions, queries, and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback.
Should you choose to include your personal details but want that information to remain confidential, please inform us by writing/typing *(CONFIDENTIAL)* above your name. Thank you.

<table>
<tr><td>Date</td><td>Place of registration</td><td colspan="4">Project Town

Project:</td></tr>
<tr><td colspan="6">Contact information/personal details</td></tr>
<tr><td>Name</td><td colspan="2"></td><td>Gender</td><td>* Male
* Female</td><td>Age</td><td></td></tr>
<tr><td>Home address</td><td colspan="5"></td></tr>
<tr><td>Place</td><td colspan="5"></td></tr>
<tr><td>Phone no.</td><td colspan="5"></td></tr>
<tr><td>E-mail</td><td colspan="5"></td></tr>
<tr><td colspan="6">Complaint/suggestion/comment/question Please provide the details (who, what, where, and how) of your grievance below:

If included as attachment/note/letter, please tick here:</td></tr>
<tr><td colspan="6">How do you want us to reach you for feedback or update on your comment/grievance?</td></tr>
</table>

FOR OFFICIAL USE ONLY

Registered by: (Name of official registering grievance)	
Mode of communication: Note/letter E-mail Verbal/telephonic	
Reviewed by: (Names/positions of officials reviewing grievance)	
Action taken:	
Whether action taken disclosed:	Yes No
Means of disclosure:	

Annexure 6: Calculation of Energy efficiency by using VFD starter for Pumps

SL.NO	Description	Pump HP	No of Pumps	Energy Consumption per day using conventional starter (kWh)	Energy Cost per day @ Rs.8.00using conventional starter	Energy Cost per Year using conventional starter	Energy Consumption per day using VFD starter (kWh)	Energy Cost per day @ Rs.8.00 using VFD starter	Energy Cost per Year using VFD starter	Energy Cost Saving	% of energy efficiency for one year (2025)
1.	SPS 01	12.5	3	202.00	1616.00	589840.00	75.16	601.27	219463.42	370376.58	37.21
2.	SPS 02	25	3	374.00	2992.00	1092080.00	132.39	1059.11	386573.52	705506.48	35.40
3.	SPS 03	50	3	868.00	6944.00	2534560.00	356.87	2854.97	1042064.50	1492495.50	41.11
4.	CTM SPS 01	10	3	150.00	1200.00	438000.00	51.61	412.90	150709.00	287291.00	34.41
5.	KSP SPS 01	80	3	449.00	3592.00	1311080.00	148.25	1186.04	432904.41	878175.59	33.02
6.	MT SPS 01	150	3	2254.00	18032.00	6581680.00	757.22	6057.75	2211078.55	4370601.45	33.59
7.	MT SPS 02	5	3	88.00	704.00	256960.00	36.24	289.94	105829.78	151130.22	41.19
8.	MT SPS 03	12.5	3	206.00	1648.00	601520.00	75.63	605.05	220844.73	380675.27	36.71
9.	VDP SPS 01	7.5	3	107.00	856.00	312440.00	34.42	275.37	100511.48	211928.52	32.17
10.	VDP SPS 02	7.5	3	108.00	864.00	315360.00	35.18	281.42	102718.78	212641.22	32.57

Annexure 7: Stakeholders Engagement Plan

Pre-Construction
An overall consultation with the general public and other stakeholders has been planned by CMWSSB prior to start of project construction for the UGSS to Puzhal, Kathirvedu (Left out Streets), Mathur, Vadaperumbakkam, Theeyambakkam.

During Construction
The engagement with the project stakeholders will be continued as required during the project implementation and the strategy is provided as below.

Stakeholder Engagement and Information Disclosure Strategy				
Project : Underground Sewerage Scheme in Puzhal & Kathirvedu (Left out Streets), Mathur, Vadaperumbakkam, Theeyambakkam– Laying of *collection system, trunk main/pumping mains, and construction of Lift Stations/ Pumping Stations*				
Target stakeholders	**Information to be disclosed**	**Proposed engagement & disclosure method**	**Timing of Engagement**	**Responsible Parties**
1. Project Affected Persons- impacted by temporary economic or physical displacement- tenants/ hawkers/ vendors on alignments	• Project design details, alignments and their impacts • Provisions for compensating economic and physical displacement, timelines for completing rehabilitation • Communication on final rehabilitation/ compensation approved by govt. • Grievance mechanism in place	• FGDs and small group consultations • Print-Newspaper, Newsletter / leaflets/ Pamphlet • Radio information capsules	• At least twice- before & after compensating • During alignment/ PS works	• PIU/CMWSSB • Contractor
Households / people residing along alignment of transmission lines or in proximity to PS sites	• Project design details, planned alignments and their impacts • Design and site alternatives explored for impact minimization • Accidents and road safety/ traffic management issues and measures	• Newsletters/ pamphlets/ flyers • Focus group discussions • TV-Radio-Print-Digital based	• Continuous, as required in construction stage • One week prior to start of construction in the respective stretches •	• PIU/CMWSSB • Contractor

Stakeholder Engagement and Information Disclosure Strategy				
Project : Underground Sewerage Scheme in Puzhal & Kathirvedu (Left out Streets), Mathur, Vadaperumbakkam, Theeyambakkam– Laying of *collection system, trunk main/pumping mains, and construction of Lift Stations/ Pumping Stations*				
Target stakeholders	**Information to be disclosed**	**Proposed engagement & disclosure method**	**Timing of Engagement**	**Responsible Parties**
	planned to be in place; • Information on likely disruptions to services and arrangement during construction including its duration and likely timings • Management of air and noise pollution; Disruption to services and arrangement during construction • Community and Occupational Safety measures planned for; • Excavation works-sludge/ earth disposal plans • Labour management plans/ proposed camp sites • Grievance mechanism process	information dissemination • Helpline/ Toll-free numbers displayed at project locations and prominently accessed areas • Suggestion boxes at site offices		
Other Interested Parties: • Resident Welfare Associations (RWAs) • Elected Reps of Municipal Corporation • Civil Society	• Project design details, planned alignments and their impacts • Design and site alternatives explored for impact minimization • Accidents and road safety/ traffic management issues and measures planned to be in place;	• One-on-one meetings • Formal Small group meetings • Open forums and Town-hall meetings for RWAs and ERs	• Continuous, as and when required during construction	• PIU/CMWSSB • Contractor

Stakeholder Engagement and Information Disclosure Strategy				
Project : Underground Sewerage Scheme in Puzhal & Kathirvedu (Left out Streets), Mathur, Vadaperumbakkam, Theeyambakkam– Laying of *collection system, trunk main/pumping mains, and construction of Lift Stations/ Pumping Stations*				
Target stakeholders	**Information to be disclosed**	**Proposed engagement & disclosure method**	**Timing of Engagement**	**Responsible Parties**
Organisations • Print and Tele Media • Staff of Line departments • Service providers and duty bearers • Staff of Municipal Corporations • Community / Religious leaders • Regulatory agencies	• Information on likely disruptions to services and arrangement during construction including its duration and likely timings • Community and Occupational Safety measures planned for WTP/ OHSR constructions and transmissions; • Excavation works-sludge/ earth disposal plans • Labour management plans/ proposed camp sites • Grievance mechanism process	• Formal presentations to closed groups like regulators, service providers and duty bearers		
Civil Works Contractor, staff & subcontractors	• Project design details, alternatives, planned alignments and their impacts • Baseline information on environmental and social aspects • Project's induced environmental and social risk • Accidents & road safety/ traffic management measures planned • Orientation on EHS provisions • Sexual harassment provisions and requirements	• Provisions in Bid/ contract documents • One-on-One and formal small group meetings/ discussions • Formal presentations/ training to contractors project management team	• Once, at the time of contract signing and orientation during pre-construction phase • Periodic briefings and orientation at site • Feedback as and when required on site and monitoring reports	• PIU/CMWSSB • Contractor

Stakeholder Engagement and Information Disclosure Strategy				
Project : Underground Sewerage Scheme in Puzhal & Kathirvedu (Left out Streets), Mathur, Vadaperumbakkam, Theeyambakkam– Laying of *collection system, trunk main/pumping mains, and construction of Lift Stations/ Pumping Stations*				
Target stakeholders	**Information to be disclosed**	**Proposed engagement & disclosure method**	**Timing of Engagement**	**Responsible Parties**
	• Labor Management Procedures • Orientation on RAP implementation and requirements • ESIA requirements and measures proposed • Grievance mechanism proposed under the project, requirements • Feedback on consultant/ contractor implementation and supervision reports			

S. No.	Aspect	Mitigation measures	Responsibility	Implementation stage	Monitoring method	Performance Indicator	Frequency
1	Public disclosure	Placement of hoarding at public and prominent places indicating inEnglishand Tamil languageprojectdetails,name and contactnumber of Convenor and the	Convenor/Contractor	Pre-construction phase	No. of hoardings and locations chosen	Effectiveness of message communicated	Once

S. No.	Aspect	Mitigation measures	Responsibility	Implementation stage	Monitoring method	Performance Indicator	Frequency
		Contractor.					
2	Conduct consultationswith thebeneficiaries,localcommunitiesand other stakeholders	Understand the perception of stakeholders, the positive and negative impact of the project; Analyze the concerns and issues of potential temperary economic impacts, local communities and other stakeholders; Address the concerns raised as per ESMP provisions; andImplementation of project with a Gender responsiveApproach.	PMC E&S experts, Contractor EHS officer/ Project Manager and Convenor of PIU	Project life cycle beginning from the early stage of pre-construction	Site observations, Review of available documents; Support or opposition of stakeholders inproject activities; Project progress level; AndConsultations conducted with stakeholders.	Procedure followed for conducting consultation; No. of meetings/ consultations held; No. of participants in each meeting; Profile of participants such as male and female; Type and severity of issues raised; Response and action taken; Awareness level aboutthe project;	

S. No.	Aspect	Mitigation measures	Responsibility	Implementation stage	Monitoring method	Performance Indicator	Frequency
						Temporary loss of potential temperary economic impacts compensated Favourable social atmosphere towards project and support to participation in project activities; and Increased engagement in terms of number and level of stakeholders and women in the project activities.	
3.	Effective functioning of GRC	Resolve the E&S related complaints and disputes in a time bound manner amicably without any cost.	GRC members headed by the authority	Project life cycle beginning from the early stage of pre-constructio	Site inspections; Consultations held withpotentialtemperary economic impacts, and other stakeholders; Project related E&S	Adequacy of information & dissemination about the GRC and its objectives among the	Whenever required

S. No.	Aspect	Mitigation measures	Responsibility	Implementation stage	Monitoring method	Performance Indicator	Frequency
				n.	complaints received inwriting or verbally.	stakeholders; No. of GRC meetings held and timeframe; GRC members present in each meeting; No. of complaints/grievances received and resolved; Time taken; Satisfaction of affectedparties; andCourt cases filed or withdrawn.	
4.	Organize meetings with line departments to seek project support as required	Coordination and meetings with the line departments, namely District Administration, SPCB, PWD, Traffic Police, GCC/ ULBs/ Town Panchayat and line agencies; Understand the role of line department	PIU CE/ SE/EE	Project Planning stage onwards	Review the feedbackof participants of themeeting; Date, time, and venuefixed as per suitability ofother departments; Communicatedinformatio	No. of officials participated in the meetings and signed the attendance sheet; Relevant information shared; Comments/suggestions offered,	Semi annually

S. No.	Aspect	Mitigation measures	Responsibility	Implementation stage	Monitoring method	Performance Indicator	Frequency
		and support envisaged for project implementation and operation; and Obtain an update related to potential temporary economic impacts, beneficiaries and other stakeholders.			ninadvance (letter signedby the CE/SE of theCMWSSB);Presentationaboutthe project (PPT),including objectives of the meeting, expectations from the participants; andQ&A details.	Effectiveness of meeting in project implementation and operation; Improved communication, coordination helpful in project activities; Increased understanding about the project related tasks; and Other facilitation roles.	
5.	Public awareness about the project	Organize public eventsand engage all stakeholders like related government departments, local communities, beneficiaries of the project,women's group, NGOs in project areas.	PIU, PMC, Contractors	Pre-construction stage and onwards	Review the public awareness activities undertaken; Feedback of target groups to assess the effectiveness of suchactivities.	People understand importance of project and need for environmental and social sustainability;	Semi annually

Stakeholder engagement format

S.No.	Activities	Details of Meetings/Consultations
1.	Officials who conducted meetings and consultations with the PAPs and other stakeholders in project villages	
2.	Name of locations and number of person participated	
3.	Profile of stakeholders (shopkeepers, residents, women, officials from other department, etc. as applicable)	
4.	Date of meetings/ consultations held	
5.	Issues and demands raised by the PAPs and other stakeholders	
6.	How these problems and demands are being solved?	

Appendix 7.1

Proceedings of the Public Hearing/Stake Holders Meeting conducted on 17/06/2023

Information on Public Consultation is given adequately to the Public by means of notice, personal contact, etc. As per the World Bank policy on access to information and disclosure, the proposed project attracts Public Hearing.

The Public Hearing was arranged by the Chennai Metropolitan Water Supply & Sewerage Board (CMWSSB). The concerned persons having plausible take in environment and social aspect were requested to attend the meeting. Wide canvassing has been made by issuing notices door to door and keeping displays. The minutes of public consultation are as follows.

The following were present during public meeting.
1. Officials
2. Social Expert
3. Counsellors
4. Members from Residential welfare association

Stake holder consultation started by EE, CMWSSB, explained the project details and listed out the street name left out in the respective areas.

ULB to explain the designed service levels and the need for reduction in service levels. Both during floods and drought ULB will strive to maintain a reduced service level.

Social Expert: Do you face Water problem during summer?

RWA: we are insisting and requesting rainwater drain system from the year 1990, we are used to adjust with the situation. The water stagnation was there for more than 2 months and we could not even step out from the house even for basic needs, sometimes our houses was flooded and the situation was very worst. Our daily livelihood was affected fully. The children were affected more than anything.

Social Expert: Do the ULB help you in clear the water?

Respondent: before they used to do but now which is not like that, they let the septic tank overflow and keep the places filled with mud. The over flowed septic tank water comes to the road, which is the situation in most of the apartments. In some of the apartment sucking the metro water by using the Motor. We too have complained about this.

Social Expert: In summer how many days you get water?

RWA: we don’t get water for 4 to 5 months in every summer

Social Expert: Than how do you manage for house hold purposes?

RWA: we use our own borewell water for all our household purposes. We spend money on RO, cane water and also, we pay tax to the government.

Social Expert:whenever the new DPR released the collective ideas and opinion received from the common people which is my role to give as a report on this to the government. I also register that do you have drainage connection? What are all the problems do you face

with the connection with sewage and without sewage? If you register your opinion one by one which will be helpful for me to register.

RWA: we already submitted the list of areas which does not have sewage connection. In our area 29th ward is the place which are located in very down so the drainage water over flows in summer season. The water stagnation removes, in last period the collection station is not maintained properly the pumping station is also not maintained properly. The sand in the widen road is accumulated in collection well and pipes got bracken we don't know which is relocated or not we don't know. They have given connection for 10 or 11 houses and rest of the houses said that you get through the connection with septic tank the situation is that the septic tank is not closed still which is in open condition. If you close the septic tank the total system of this project will be collapsed and because which is not maintained properly.

Social Expert: can you please tell me the situation of your area during the flood?

RWA: During the rainy season the sewage water is missing with septic tank water, in some areas bypassing the water with other areas without removing the blockage, which creates the Mosquitos problems

Counsellor: we have done the survey of the areas without sewage connection and estimated to implementing the scheme at our area. 45 percent of the areas under funding proposals. The new evaluation DPR prepared related that any concern please let us know?

RWA: can you please let us know the time period to complete the project?

Social Expert: in next three years?

RWA: Under water sewage is the major concern in comparison with other issues like water scarcity, health and sanitation issues and so on. The work should be started before rainy season. During the election the work will be stopped.
In our area the places where the blockage resists which needs to be corrected and removed before the rainy season.

RWA : The lacking of manpower and machineries is there, where are you going to locate the pumping station?

RWA : in our area for 20 houses, we cannot place pumping station so which will come as a joining method of other areas. Due to urbanization and raising of new houses the corporation could not plan for the future aspect and placing the drainage connection.

RWA : we have taken resolution to bring under water sewage and drinking water connection in all the areas of Vadaperumbakkam. During November, December and January the work would be very slow usually.

Mrs. Lakshmi Devi (Executive Engineer, CMWSSB) concluded the meeting by thanking all the participants who have attended the meeting.

Attached

1. Attendences

PROVIDING UNDERGROUND SEWERAGE SCHEME TO VADAPERUMBAKKAM & THEEYAMBAKKAM (DIVISION – 17) & MATHUR (DIVISION – 19) AREA-II, IN CHENNAI CITY

S.No	Name	Address	Phone Number & Mail ID	Signature
1	R.P. BABU	2435, LIG-II AREA - 15 Dn	9444 111158	
2.	G. Suresh	No:9 Kamaraj Nagar Nathamuniyar ch-68	98401 00096	
3.	M. RAJARAJAN	1230-782	8939291067	
4.	K.G. BABUSI	1230	9003133370	
5	M. JAHEER	49/50, SAMUVEL	9444039010	
6.	FARHAN	No.10. Gopal Ng	9840099695	
7				
8		3049 LIG-I	98400 14160	
9)	S.	3650/LIG-2/mmda MATHUR/ch-68.	9884154303	
10	R. Babu.	4/49	93855 333	R. Babu
11.	Baskath Ali	33, Sridhanyalakshmi Ngr, chettimedu, ch-60	8608887860	
12.	S. Sudhagar.	49/50 Samuel Ngr, VPKM, Ch-60.	8939834456.	
13	G.		9840216078	
14	FIROZ, HATIM	PLOT NO2, Rose Nagar, Vadaperumbakkam	9840692900	
15	M. Mustaq hussain	no.9, Gopal Nagar vadaperumbakkam	8148631123	
16	J. Mallathi	vadaperumbakkam	8122265067	

PROVIDING UNDERGROUND SEWERAGE SCHEME TO VADAPERUMBAKKAM & THEEYAMBAKKAM (DIVISION – 17) & MATHUR (DIVISION – 19) AREA-II, IN CHENNAI CITY

S.No	Name	Address	Phone Number & Mail ID	Signature
17	Dr. SIVAPRAKASH.S	3/53, PERUMAL KOIL ST, KOLAPPUR CH-6.	9840394436 sivasivam...@gmail.com	
18	V. [illegible]	3/245 [illegible]	9840596645	V. [illegible]
19	A. [illegible]	3/187 [illegible]	9094747246	[illegible]
20	R. [illegible]	21, Perumal Koil St, Vadaperumbakkam Chennai-...	9840169514	[illegible]
21	S. [illegible]	2/87, [illegible]	9840395919	[illegible]
22	R. [illegible]	2/57, [illegible]	9840936435	R. [illegible]
23	D - [illegible]	2/42 [illegible]	7200545124	[illegible]

PROVIDING UNDERGROUND SEWERAGE SCHEME TO VADAPERUMBAKKAM & THEEYAMBAKKAM (DIVISION – 17) & MATHUR (DIVISION – 19) AREA-II, IN CHENNAI CITY

S.No	Name	Address	Phone Number & Mail ID	Signature
1	P. KARPAGAM	SE(N), CMWSSB	8144931000	P. Karpagam
2	R VENKATESAN	Asst Engineer (II)	8144930902	R Venkatesan
3	S. KARTHIC	FE/Trainee / AEE i/c (T&D)	8144930900	
4	J. LAKSHMI DEVI	FE I / P&D	8144930952	
5	N. Singaravelan	EE / P&D	8144930970	
6	S VIJAYALAKSHMI	EE (Cony-V)	8144930540	S. Vijayalakshmi
7	M. RENUKADEVI	DAE 5 (Area-II)	8144930205	M. Renukadevi
8	D. R. SUSMITHA	AE (P&D)	8144930581	
9	R. AADHARSH RAJKUMAR	Environmental Engineer.	8072435765	
10	Dr. A. D. NUNDHAY	Social Expert	9940205628	

PROVIDING UNDERGROUND SEWERAGE SCHEME TO PUZHAL (DIVISON - 22, 23) & LEFT OUT STREETS OF KATHIRVEDU (DIVISION - 25) AREA III, IN CHENNAI CITY

S.No	Name of the Official	Address	Mail ID/Phone Number	Signature
1	A. Vamadevan	NO:(12/10, E. [illegible]	9444863327	A. Vamadevan
2.	R. Anbazhagan	100, E. Block TC. Nagar, Ch-10	9444186226	
3	N. Arumugam	147/42 E. Block T.C Nagar	9444733013	
4.	D. RAMACHANDRAN	52 AVM Nagar Extension Madl	9941255335	
5.	K. ILAYARAJA	NO: 9 AVM Nagar Ext, Madhavaram	8056007207	
	N. Jagal [illegible]	Ring Road housing Sector		
	R.S. ANNADURAI	7, RANGA AVENUE 3RD CROSS ST, SRINIVASA NAGAR MAIN RD	7305243884	R.S.A.
	[illegible]	23, [illegible]	9444329613	
	P. Elangoram	no 5 Saptagiri nagar Laxmipuram ch 99 Extn	9840335944	
	S. Bamu[illegible]	NO: 51. [illegible]	6384606689	S. Bamu
	D. S. Srinivasan	[illegible]	9840896933	
	S. Deepanchakravarthy	No: 51 Ganesh amman nagar, 1st St Moolakadai	9840104882	
	G. Balaji	22, 2nd Street Kamatchiamman Nagar Pannianmman main	9003184328	
	SP. [illegible]	No:, Kamatchi Amman Nagar, Kannimamal Chitlo	9940653473	
	V. KESAVAN	18/C2 [illegible]	9444806049	
	Balasubramanian	[illegible]	9884692550	

PROVIDING UNDERGROUND SEWERAGE SCHEME TO PUZHAL (DIVISON - 22, 23) & LEFT OUT STREETS OF KATHIRVEDU (DIVISION - 25) AREA III, IN CHENNAI CITY

S.No	Name of the Official	Address	Mail ID/Phone Number	Signature
	S. [illegible]	MCG [illegible] MMC. ch-57	9444336137	S. [illegible]
	S. Kavimozhi, M.C	No:9 K.P.K St, Madhavaram Ch-60	7550131/88	[illegible]
	J. ASNA MERRYSHIA, M.C.	8/22D, Kavi Street, Kamban Nagar, MMC, Chennai-51	8778500603	[illegible]
	M. [illegible]	No:23 Nethaji Street Noolahalpuri-99	9500062728	M. [illegible]
	B. Sangeetha	No 3 Ambal nagar surapet main [illegible]	8939390934	[illegible]
	I. Karthikeyan	204 Swamy M.C Ponneliyamman Colony	9791025467	T.I.C
	P. PONSELVI	67A. Asiriyar Anna nagar. Ch-50	9486148226	P. Ponselvi
	E. Mohan	24/ Ponniyan Nagar Ambattur Kakkadi	9791094550	[illegible]
	V. KAJAN	95 Thiru Nilai Kavalan Puram	8608720755	[illegible]
	A. RAJESH	Sathya Sai Nagar Madhavaram	9841303018	[illegible]
	S. RAJU	LAKSHMIPURAM	9444034[illegible]	[illegible]
	S. Ajith	Shanthi St	9840508417	[illegible]
	D. IRUDAYARAJ	Puzhal	9444245542	[illegible]
	D. RAJAMANI	PUZHAL	9941441424	[illegible]

PROVIDING UNDERGROUND SEWERAGE SCHEME TO PUZHAL (DIVISON - 22, 23) & LEFT OUT STREETS OF KATHIRVEDU (DIVISION - 25) AREA III, IN CHENNAI CITY				
S.No	Name of the Official	Address	Mail ID/Phone Number	Signature
	S. VANDAGAM			9444207715
				9382138508
	P. KARPAGAM	SE(N), CMWSSB	8144931000	
	J. LAKSHMI DEVI	EE I, P&D, CMWSSB	8144930952	
		8/120	9444412967	
	D. AADHARSH RAJKUMAR.	Envi. Engg.	8072435765	
		Social Expert	9940205623	
	S. VIJAYALAKSHMI	EE (Con-V)	8144930540	
	D.R. SUSMITHA	AE (P&D)	8144930581	

2. Feedback Forms

CHENNAI METROPOLITAN WATER SUPPLY AND SEWERAGE BOARD

FEEDBACK FORM FOR STAKEHOLDERS MEETING

PROVIDING UNDERGROUND SEWERAGE SCHEME TO VADAPERUMBAKKAM & THEEYAMBAKKAM (DIVISION – 17) & MATHUR (DIVISION – 19) AREA-II, IN CHENNAI CITY

Place: Area II Office,
No.162, Nedunchezhian Salai, Manali, Chennai-600 068

Date: 17.06.2023

Name:	M. JAHEER HUSSAIN
Designation:	AMS MEDITECH INDIA PVT LTD
Department and Address:	49 & 50, 1st Floor, Samuvel Nagar Vadaperumbakam, Chennai - 600060
Mobile no.:	9840094549.
Email Id:	sales@amsmeditech.com.

Please record your opinions and suggestions

Greetings from Ams, Vadaperumbakkam,

Nice Meeting and arrangement It is very useful to us, Kindly arrange drainage / water systems as soon as possible.

Suggesions:-

1. Keep the information Board about the project Contractor Numbers and alternative number (Should be reachable) It is help us to make precautions.

2. if u assign the job area wise with some plan so, we can keep stock and other alternatives because we are medical Distributers. It should not affect our emergency situations.

Signature

3. Keep monitor to level of the drainage systems. Since we affected because of storm wates it is not even (2-3 feet higgiht from Road levels).

சென்னை பெருநகர் குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியம்

கலந்தாய்வு கூட்ட கருத்து படிவம்

பாதாள குழாய் மூலம் கழிவுநீர் அகற்றும் திட்டம் –

வடபெரும்பாக்கம், தீயம்பாக்கம் மற்றும் மாத்தூர்

இடம்: பகுதி அலுவலகம் – 2,
எண். 162, நெடுஞ்செழியன் சாலை, மணலி,
சென்னை – 600 068.

தேதி: 17.06.2023

பெயர் :	M. Mustaq hussan
பதவி / தொழில் :	Plastic Repuses Company
முகவரி :	No.9, Gopal நகர், Vadaperumbakkam 17th ward
கைபேசி எண் :	814 863 1123
மின்னஞ்சல் :	Mustaqahussan@gmail.com

உங்கள் கருத்துக்கள் மற்றும் ஆலோசனைகளை பதிவு செய்யவும்

எனது பார்வையில் இதில் தேவையான நகர் உறையிலான சாலைகளில் நாடி உள்ள பகுதியில் உள்ளதால் அனைத்து வெள்ளத்தில் பாதிப்பு அதிகமாவு பார்க்கப்படும். மேலும் மழைநீர் வடிகால் பணியாளரி குறைவாக உள்ள சாலைப்பகுதியாய் நகரங்கள் பார்க்கப்படுமானால். இதை யும் தாழ்வாக எனைத்திற்கு கொள்ளவும்

கையொப்பம்

M. Mustaq

சென்னை பெருநகர் குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியம்

கலந்தாய்வு கூட்ட கருத்து படிவம்

பாதாள குழாய் மூலம் கழிவுநீர் அகற்றும் திட்டம் –

வடபெரும்பாக்கம், தீயம்பாக்கம் மற்றும் மாத்துர்

இடம்: பகுதி அலுவலகம் – 2,
எண். 162, நெடுஞ்செழியன் சாலை, மணலி,
சென்னை – 600 068.

தேதி: 17.06.2023

பெயர் :	FIROZ. HAJIM.
பதவி / தொழில் :	Textile Pubric co.
முகவரி :	Plot No, 2, 3, Rose Nagar Vandaperumbakkam chn 60
கைபேசி எண் :	9840692900
மின்னஞ்சல் :	Sestagency2016@gmail.com

உங்கள் கருத்துக்கள் மற்றும் ஆலோசனைகளை பதிவு செய்யவும்

Facing lot of Drainage issue. Request to provide Sewage line & Metro water line as soon as possible as I am paying all Taxs Regularly Request to do the needful. Thankyou

Firoz
17/6/2023.
கையொப்பம்

CHENNAI METROPOLITAN WATER SUPPLY AND SEWERAGE BOARD

FEEDBACK FORM FOR STAKEHOLDERS MEETING

PROVIDING UNDERGROUND SEWERAGE SCHEME TO VADAPERUMBAKKAM & THEEYAMBAKKAM (DIVISION – 17) & MATHUR (DIVISION – 19) AREA-II, IN CHENNAI CITY

Place: Area II Office,
No.162, Nedunchezhian Salai, Manali, Chennai-600 068

Date: 17.06.2023

Name:	FARHAN
Designation:	
Department and Address:	No. 10. Gopal Nagar Vadaperumbakkam ch -60
Mobile no.:	98400 99695
Email Id:	

Please record your opinions and suggestions

1. Before starting the project make sure the Completion date is fixed.
2. Make Safety precautions
3. Bcoz Lot of Road Digging work has disturbed the total Industry & the production
4. Make Sure that Roads & Re-laid perfectly

Signature

சென்னை பெருநகர் குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியம்

கலந்தாய்வு கூட்ட கருத்து படிவம்

பாதாள குழாய் மூலம் கழிவுநீர் அகற்றும் திட்டம் –

வடபெரும்பாக்கம், தீயம்பாக்கம் மற்றும் மாத்தூர்

இடம்: பகுதி அலுவலகம் – 2,
எண். 162, நெடுஞ்செழியன் சாலை, மணலி,
சென்னை – 600 068.

தேதி: 17.06.2023

பெயர் :	R. விஸ்வநாதன், B.A., LLB.
பதவி / தொழில் :	சிவில் என்ஜினீயர்
முகவரி :	257, பெருமாள் கோவில் தெரு-17, வடபெரும்பாக்கம் சென்னை-600
கைபேசி எண் :	9840936435
மின்னஞ்சல் :	visuvanathan1977@gmail.com

உங்கள் கருத்துக்கள் மற்றும் ஆலோசனைகளை பதிவு செய்யவும்

1) VDP/SPS-02, VADAPERUMPAKKAM, 17-ward, Perumal kovil street பம்பாய். அமைக்கும் பணி. அந்த இடத்திற்கு தேவையில்லை. என்பது என்னுடைய கருத்து.

2) வடபெரும்பாக்கம். பெருமாள் கோவில் தெரு வழி. சாலையில், கழுதுகள், அருவருப் பாதாள குழாய் மூலம் கழிவு நீரை உடனே அகற்றவும்.

கையொப்பம்

R. Viswanathan

CHENNAI METROPOLITAN WATER SUPPLY AND SEWERAGE BOARD

FEEDBACK FORM FOR STAKEHOLDERS MEETING

PROVIDING UNDERGROUND SEWERAGE SCHEME TO VADAPERUMBAKKAM & THEEYAMBAKKAM (DIVISION – 17) & MATHUR (DIVISION – 19) AREA-II, IN CHENNAI CITY

Place: Area II Office,
No.162, Nedunchezhian Salai, Manali, Chennai-600 068

Date: 17.06.2023

Name:	S. UDAYA KUMAR
Designation:	CIVIL CONTRACTOR
Department and Address:	3680/LIG-2/MMDA/MATHUR CHENNAI-68.
Mobile no.:	9884154303
Email Id:	Udayakumarsrini@gmail.com.

Please record your opinions and suggestions

A long waiting Scheme in our Mathur Area. We are happy to welcome the Scheme in behalf of Public, those does not have Sewerage in our area. Mathur a fast developing area in chennai city needs underground Sewerage as soon as possible.

Our Main request is to Complete the Project within the given ~~time~~ time, which will be very needfull for the Public.

Thanking you.

Signature

சென்னை பெருநகர் குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியம்

கலந்தாய்வு கூட்ட கருத்து படிவம்

பாதாள குழாய் மூலம் கழிவுநீர் அகற்றும் திட்டம் –

வடபெரும்பாக்கம், தீயம்பாக்கம் மற்றும் மாத்துர்

தேதி: 17.06.2023

இடம்: பகுதி அலுவலகம் – 2,
எண். 162, நெடுஞ்செழியன் சாலை, மணலி,
சென்னை – 600 068.

பெயர் :	S. அசோக் தீபன்
பதவி / தொழில் :	சிவில் இன்ஜினியர்
முகவரி :	No: அ 2/87, பெருமாள் கோயில் தெரு வடபெரும்பாக்கம்
கைபேசி எண் :	9840395919
மின்னஞ்சல் :	—

உங்கள் கருத்துக்கள் மற்றும் ஆலோசனைகளை பதிவு செய்யவும்

எங்கள் ஊரில் பெருமாள் கோயில் தெருவில்
குந்து பம்பிங் ஸ்டேஷன் தேவை இல்லை

கையொப்பம்

சென்னை பெருநகர் குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியம்

கலந்தாய்வு கூட்ட கருத்து படிவம்

பாதாள குழாய் மூலம் கழிவுநீர் அகற்றும் திட்டம் –

வடபெரும்பாக்கம், தீயம்பாக்கம் மற்றும் மாத்தூர்

இடம்: பகுதி அலுவலகம் – 2,
எண். 162, நெடுஞ்செழியன் சாலை, மணலி,
சென்னை – 600 068.

தேதி: 17.06.2023

பெயர் :	R. சீனிகார்வால்
பதவி / தொழில் :	Business.
முகவரி :	2, பெருமாள் கோயில் தெரு. வட பெரும்பாக்கம் சென்னை-600
கைபேசி எண் :	9840169514
மின்னஞ்சல் :	Sankwlal@gmail.com.

உங்கள் கருத்துக்கள் மற்றும் ஆலோசனைகளை பதிவு செய்யவும்

வடபெரும்பாக்கம் கோயில் அருகில் வரும் (பெருமாள் கோயில் தெரு) கழிவுநீர் ஏற்று நிலையம் வருவதை நானும் நடக்கவுள்ள அனைவரும் ஏற்று கொள்ள மாட்டோம்

கையொப்பம்

சென்னை பெருநகர் குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியம்

கலந்தாய்வு கூட்ட கருத்து படிவம்

பாதாள குழாய் மூலம் கழிவுநீர் அகற்றும் திட்டம் –

வடபெரும்பாக்கம், தீயம்பாக்கம் மற்றும் மாத்தூர்

இடம்: பகுதி அலுவலகம் – 2,
எண். 162, நெடுஞ்செழியன் சாலை, மணலி,
சென்னை – 600 068.

தேதி: 17.06.2023

பெயர் :	K. மாரன்
பதவி / தொழில் :	தொழிலாளர்
முகவரி :	67. திருகாசலம் நகர் வடபெரும்பாக்கம் சென்னை-60
கைபேசி எண் :	9952915810
மின்னஞ்சல் :	-

உங்கள் கருத்துக்கள் மற்றும் ஆலோசனைகளை பதிவு செய்யவும்

வடபெரும் பாக்கம் பகுதியில் குடியிருப்போருக்கு குடிநீர் வசதி நன்றாக இருக்கிறது.

K. மாரன்

கையொப்பம்

சென்னைப் பெருநகர் குடிநீர் வழங்கல் கழிவுநீரகற்று வாரியம்

கலந்தாய்வு கூட்ட கருத்து படிவம்

விரிவான பாதாளச் சாக்கடை திட்டம்
வடபெரும்பாக்கம், தீயம்பாக்கம் மற்றும் மாத்தூர்

இடம்: நெ. 162, நெடுஞ்செழியன் சாலை, மணலி,
சென்னை – 600 068

தேதி: 17.06.2023

பெயர் :	அஜ். பாபு
பதவி / தொழில் :	விவசாயி / நிலம் வைத்திருப்பவர்
முகவரி :	4/79, நேரு மெயின் ரோடு, மந்தம் பாக்கம் / சென்னை - 60.
கைபேசி எண் :	9385544333.
மின்னஞ்சல் :	

உங்கள் கருத்துக்கள் மற்றும் ஆலோசனைகளை பதிவு செய்யவும்

எங்கள் பகுதிக்கு பாதாளச் சாக்கடை திட்டம் வருவதை மகிழ்ச்சியுடன் வரவேற்கிறோம்.

எங்கள் மந்தம்பாக்கம் பகுதியில் அனைத்து தெருக்களிலும் பாதாள சாக்கடை திட்டம் கண்டிப்பாக செயல்படுத்த வேண்டும் என்பதே எங்கள் கோரிக்கை.

திட்டத்தை விரைவாக முடிக்க வேண்டும் என்பதே எங்கள் கோரிக்கை.

கையொப்பம்

A Babu.

சென்னைப் பெருநகர் குடிநீர் வழங்கல் கழிவுநீரகற்று வாரியம்

கலந்தாய்வு கூட்ட கருத்து படிவம்

விரிவான பாதாளச் சாக்கடை திட்டம்
வடபெரும்பாக்கம், தீயம்பாக்கம் மற்றும் மாத்தூர்

இடம்: நெ. 162, நெடுஞ்செழியன் சாலை, மணலி,
சென்னை – 600 068

தேதி: 17.06.2023

பெயர் :	இரா. [illegible]
பதவி / தொழில் :	தி.மு.க. மன்ற உறுப்பினர், மாத்தூர்
முகவரி :	4/335- அவ்வை தெரு, பாரதி நகர், சின்னமாத்தூர், மணலி, சென்னை-68.
கைபேசி எண் :	9962054388.
மின்னஞ்சல் :	

உங்கள் கருத்துக்கள் மற்றும் ஆலோசனைகளை பதிவு செய்யவும்

கலந்தாய்வு அலுவலர் அவர்களுக்கு வணக்கம். [illegible] சின்ன மாத்தூர் பகுதி அனைத்துப் பகுதிகளுக்கும் மேம்பாட்டுத் திட்டத்தினை [illegible] பாதாளசாக்கடை குழாய்கள் அமைக்கும் மேம்பாடு திட்டத்தினை நெஞ்சார வரவேற்கிறேன் மேலும் சின்ன மாத்தூர் மேம்பாட்டுத் திட்டத்திற்கு பணிகளை [illegible] [illegible] ஒத்துழைப்பு கொடுப்போம் என உறுதி கூறுகிறேன்.

இரா. [illegible]
கையொப்பம்

Scanned with OKEN Scanner

CHENNAI METROPOLITAN WATER SUPPLY AND SEWERAGE BOARD

FEEDBACK FORM FOR STAKEHOLDERS MEETING

PROVIDING UNDERGROUND SEWERAGE SCHEME TO VADAPERUMBAKKAM & THEEYAMBAKKAM (DIVISION – 17) & MATHUR (DIVISION – 19) AREA-II, IN CHENNAI CITY

Place: Area II Office, No.162, Nedunchezhian Salai, Manali, Chennai-600 068

Date: 17.06.2023

Name:	DR. SIVAPRAKASH.S
Designation:	
Department and Address:	3/53, PERUMAL KOIL ST; KODUNGAIYUR. CH-60.
Mobile no.:	9840394436.
Email Id:	Signsiva007@gmail.com.

Please record your opinions and suggestions

CMWSSB Works are good & Satisfied during Pandemic & epidemic Periods.

1) The Request is to speedup the process.

2) Make Safety measures like Barricades & for Flow Arrangements.

3) Kindly speedup the process

Signature

சென்னைப் பெருநகர் குடிநீர் வழங்கல் கழிவுநீரகற்று வாரியம்

கலந்தாய்வு கூட்ட கருத்து படிவம்

விரிவான பாதாளச் சாக்கடை திட்டம்
வடபெரும்பாக்கம், தீயம்பாக்கம் மற்றும் மாத்தூர்

இடம்: நெ. 162, நெடுஞ்செழியன் சாலை, மணலி,
சென்னை – 600 068

தேதி: 17.06.2023

பெயர் :	M. ராஜராஜன்
பதவி / தொழில் :	TNHB காலனி இயங்கும்போர் நீங்கள் வேண்டாதவர்கள்
முகவரி :	1230-7-82A தெரு மணலி சென்னை-68
கைபேசி எண் :	8939291067
மின்னஞ்சல் :	mrajarajan1230@gmail.com

உங்கள் கருத்துக்கள் மற்றும் ஆலோசனைகளை பதிவு செய்யவும்

இந்த பகுதிக்கட்ட பற்றி மொத்தமாக்கிய கருத்து கேட்பு அல்ல எதிர்காலத்தில் மொத்தமாக்கள் அங்கீகரிக்கின்ற தகவல்களை தெரிவித்து தெரியவேண்டும்

M. [signature]

கையொப்பம்

CHENNAI METROPOLITAN WATER SUPPLY AND SEWERAGE BOARD

FEEDBACK FORM FOR STAKEHOLDERS MEETING

PROVIDING UNDERGROUND SEWERAGE SCHEME TO VADAPERUMBAKKAM & THEEYAMBAKKAM (DIVISION – 17) & MATHUR (DIVISION – 19) AREA-II, IN CHENNAI CITY

Place: Area II Office,
No.162, Nedunchezhian Salai, Manali, Chennai-600 068

Date: 17.06.2023

Name:	K.G. பாபு
Designation:	TNHB போன்ற அடுக்குமாடி குடியிருப்பு
Department and Address:	வடபுறம் நகரம் MMDA எல்லை 230 சதுர அடி MMDA மாடி.
Mobile no.:	9003137590
Email Id:	

Please record your opinions and suggestions

இந்த பகுதியை சுற்றி திட்டத்தின் அனைத்து அலுவலர் குறைகள் கேட்டு தீர்த்து வைக்க வேண்டும்

Signature

சென்னை பெருநகர் குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியம்

கலந்தாய்வு கூட்ட கருத்து படிவம்

பாதாள குழாய் மூலம் கழிவுநீர் அகற்றும் திட்டம் –

புழல் மற்றும் கதிர்வேடு (விடுப்பட்ட தெருக்கள்)

இடம்: பகுதி அலுவலகம் – 3,
எண். 1, பெருமாள் கோயில் தெரு, மாதவரம்,
சென்னை – 600 060.

தேதி: 17.06.2023

பெயர் :	R. SARAVANAN
பதவி / தொழில் :	BUSINESS
முகவரி :	NO. 85, MAR NAGAR CYCLE SHOP. PUZHAL, CH-66 / Zone-3 Ward-31
கைபேசி எண் :	9380451114.
மின்னஞ்சல் :	

உங்கள் கருத்துக்கள் மற்றும் ஆலோசனைகளை பதிவு செய்யவும்

Myself R. Saravanan, I am staying here at 44 years, In my area, no drainage connection and metro water. We are using Panchayat water more than 20 years. Our Area Councillor Mrs. Sayeetha Babu approached many times metro water MD, and he promised that we bring metro water and drainage connection as soon as. I am requesting you to bring drainage connection as earlier.

கையொப்பம்

R Sa

சென்னை பெருநகர் குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியம்

கலந்தாய்வு கூட்ட கருத்து படிவம்

பாதாள குழாய் மூலம் கழிவுநீர் அகற்றும் திட்டம் –

புழல் மற்றும் கதிர்வேடு (விடுப்பட்ட தெருக்கள்)

இடம்: பகுதி அலுவலகம் – 3,
எண். 1, பெருமாள் கோயில் தெரு, மாதவரம்,
சென்னை – 600 060.

தேதி: 17.06.2023

பெயர் :	A. Varadhan
பதவி / தொழில் :	Metro Water (ஓய்வு)
முகவரி :	112/10 'E' Block, (அண்ணா நகர் மேற்கு) 112/10 Ambedkhar St. (வ.எ.29) Ch. No.
கைபேசி எண் :	9444863327
மின்னஞ்சல் :	

உங்கள் கருத்துக்கள் மற்றும் ஆலோசனைகளை பதிவு செய்யவும்

Drainage connection registered.
Pending for so many years.
Ambedkhar Street,

A. Varadhan
17/06/23
கையொப்பம்

3. Photographs


சென்னை பெருநகர் குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியம்
மக்கள் கருத்து கேட்பு கூட்டம்


NO. OF PUBLIC FOUNTAINS
NO. OF HEADWORKS
NO. OF FILLING POINT
NO. OF WATER LORRY (PRIVATE)
NO. OF TANKS
NO. OF AUTOMATIC CHLORINATORS
LENGTH OF SEWER MAIN IN KM
NO. OF MANHOLES
NO. OF SEW. PUMPING STATIONS
சென்னை பெருநகர் குடிநீர் வழங்கல் மற்றும் கழிவுநீரகற்று வாரியம்
மக்கள் கருத்து கேட்பு கூட்டம்


சென்னை பெருநகர் குடிநீர் வழங்கல் மற்றும் கழிவுநீர்கற்று வாரியம்
மக்கள் கருத்து கேட்பு கூட்டம்
சென்னை பெருநகர் குடிநீர் வழங்கல் மற்றும் கழிவுநீர்கற்று வாரியம்
கருத்து கேட்பு கூட்டம்


சென்னை பெருநகர் குடிநீர் வழங்கல் மற்றும் கழி
மாதவரத்தில் உள்ள (விடுப்பட்ட தெ
மக்கள் கருத்து கேட்பு கூ

Annexure 8: Waste management plan

S. No.	Aspect	Mitigation measure/Procedure	Responsibility	Implementation	Monitoring methods	Performance indicators	Frequency
1.	Up keep of storage/yard	Dispose-off the waste from the material storage to the designated site; and Ensure regular collection and removal of refuse and litter from the working site, office, labour accommodation, etc.	Contractor	Construction phase	Visual Inspection	Incidence of contamination	Daily
2.	Labour accommodation	Place sufficient number of garbage bins/containers at prominent locations of the project working sites and labour accommodations; Ensure emptying the garbage bins and dispose-off from the labour accommodation regularly in a hygienic manner; Dispose-off domestic waste water into drainage; Ensure sufficient number of bathingand ablution facilities in labour accommodations, sheds, and all the site staff; Create awareness about the importance and safe disposal of waste at work sites, labouraccommodation and surroundings among the	Contractor	Construction phase	Visual inspections; and Records of waste disposal.	Incidence of staff not using facilities; and Incidence of pollution.	Daily

S. No.	Aspect	Mitigation measure/Procedure	Responsibility	Implementation	Monitoring methods	Performance indicators	Frequency
		workers; and Imparttrainingabouthandlingthedifferenttypesofwastes,wastemanagement,including hazardous waste.					
3.	Waste management measures	Collect all waste bins, containers from all sites; Collect recyclable wastesseparatelyand arrange for its collection by the authorized vendor; Prevent littering and pollutionbyconstructionstaffat work sites byproviding bins or waste bags in sufficient locations; Provide separate bins/containers for hazardous materials and mark these clearly; Store hazardous / polluting materials on impermeable ground until disposed-off or collected by the authorized vendor; Donotallowanyburningorburying of waste on site; and Dispose of	Contractor	Throughout project life cycle	Regular audits of the CWMP implementation; Visual inspection of waste collection and disposal; and Construction areas for littering	CWMP inplace; Extentto which CWMP is complied with; Presenceoflitter; Extentof filling rubbish bins; Total volume of general and hazardouswaste storage capacity onsites; Extent of waste segregation; and Frequency of waste collection and disposal	Daily/ weekly as applicable

S. No.	Aspect	Mitigation measure/Procedure	Responsibility	Implementation	Monitoring methods	Performance indicators	Frequency
		rubble and otherwasteconstructionmaterials atthe designated site.					
4.	Disposal of residualconstructi on debris, excessoilandothe r materials	The contractor shall identify the site for debris and waste disposal that should be finalized prior to start of theearthworks; Apply good practices and minimize the construction debris by the optimum use of material; Reusetheexcavatedsoilandother materialinbackfilling, landscaping,fillinglow lying area and public places. Yet the unused residue of soil and sedimentation left will be disposed of; Ensure that disposed waste do not cause soil and ground water pollution; Contractor should ensure that designated landfill site should be located in non-residential area at least 1000 meter away so that residents, flora and fauna are not impacted; Regularly clean up concretes	Contractor	Construction phase	Audit of excess and residual construction material disposal recordsand data; and Visual inspection.	Excavated soiland other wastes visible; and Cleanliness and maintenance of sites.	Dailyandregu larly.

S. No.	Aspect	Mitigation measure/Procedure	Responsibility	Implementation	Monitoring methods	Performance indicators	Frequency
		pilled during construction; Sweep / rake / stack excess aggregate / stone chip / gravel / pavers into piles; Emptied cement and other material bags, containers and unusable bins sold to a licensed vendor; Dispose excess and residual waste to the designated site; The training should be imparted to all staff about the effects of waste and litter and follow the appropriate disposal procedures; and Construction waste at site should be handled as per Construction and Demolition Waste Management Rules, 2016.					
5.	Hazardous waste disposal	Ensurethatcontaminants (includingcement)are not placeddirectlyonthegroundtoprevent runoff reaching the water resources; Ensure that the spillage of fuels,	Contractor	Construction and operation phases	Audit of hazardous material disposal recordsand data; and	Incidenceofnon-compliancewith safety procedures concerning hazardouswaste material;	Daily or as required

S. No.	Aspect	Mitigation measure/Procedure	Responsibility	Implementation	Monitoring methods	Performance indicators	Frequency
		oil, lubricants collected does not contaminate the soil and water; Ensurethetrainingofworkforceabout environmental pollutionandits management; Ensure disposal of hazardous waste at the designated site by the authorized vendor and prevention of pollution therein; Ensurehazardousmaterials such as solventbasedpaints, fuel, cleaning and polishing chemicals are handled with extreme precaution during their storing, transportation, and usage. Such material should be stored on impervious space/ floor; Ensure that only trained workers are involved in collection, storage, and disposal process; Allprecautions, safety and health measures are followed; Dispose of non-recyclableandrecyclablemetalobjectsthrough authorized vendor;			Visual inspection of hazardous materials handling, storage areas and disposal practices.	Availability of spillage kits; Incidence of spillage of hazardous materials on site; and Evidence of leaks and contamination of soil and water	

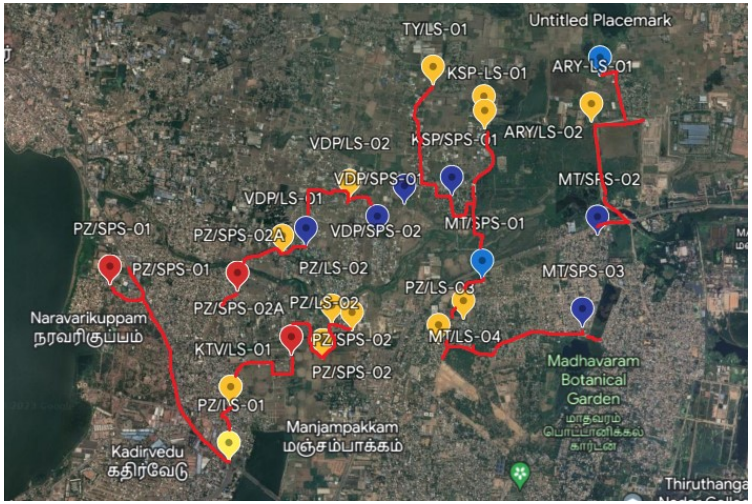
S. No.	Aspect	Mitigation measure/Procedure	Responsibility	Implementation	Monitoring methods	Performance indicators	Frequency
		and Regularly audit the recordsmaintainedfor hazardous and other waste generated and disposaltodesignated site.					
6.	Closure and rehabilitation of construction and labour sites	Contractor to restore the original condition of the site prior to demobilization; Uponworks completion, clear all structures, rubbish,fill-inandsealallthepitsandtrenches; Removeallconstructionequipment,vehicles, equipment, waste and surplusmaterials, temporaryfencingandotheritemsfromthe site; Clean up and remove any spills and contaminated soil in theappropriate manner; Donotburydiscarded materials on site or any other land not designated for this purpose; Handoverthe completed constructionsiteandthesitesusedformaterialstorageand labour accommodationsandshedswillbe	Contractor	After completion of the civil works in construction phase	Physicalverificationofthesiteaswellasitemslistedintherecordsof contractor; and Rehabilitation measures conducted after completion of construction and operation works.	Clean andclearsite; Site rehabilitated; and Original condition of construct ion and other sites restored	Onetime

S. No.	Aspect	Mitigation measure/Procedure	Responsibility	Implementation	Monitoring methods	Performance indicators	Frequency
		handed over; and Handover the project site after completionof operation phase.					

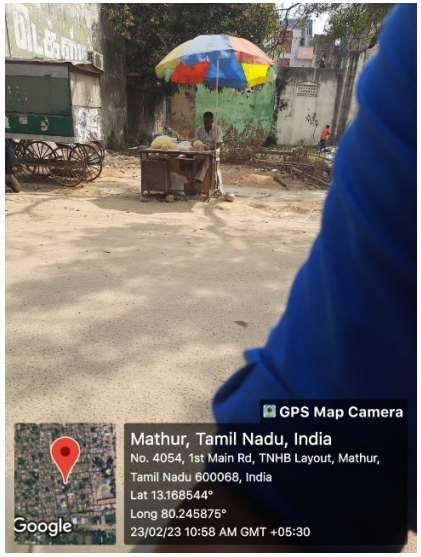
Annexure 9: Socio economic details of Potential Temporary Economic Impacts

Sl. No	Name	Gender	Age	Education	Marital Status	Family Members	Residential Structure/Ownership status	Types of Commercial structure	Average Income per day	Vulnerable Category
1	Rathinam	Male	42	SSLC	Married	5	Rental House	Bag shop	500	No
2	Radha	Female	48	Uneducated	Married	4	Rental House	Flower Shop	300	Yes
3	Manjula	Female	40	Uneducated	Married	4	Rental House	Tiffin shop	500	Yes
4	Mariyammal	Female	52	Uneducated	Married	2	Rental House	Flower Shop	400	Yes
5	Ramachandran	Male	55	SSLC	Married	2	Rental House	Flower Shop	500	No
6	Kumar	Male	26	HSC	Unmarried	3	Rental House	Petti Shop	600	No

Social Survey date: 21-02-2023 - Cut-off date: 22-02-2023



Survey alignment Map of Puzhal, Kathirvedu, Mathur, Vadaperumbakkam, Theeyambakkam



Potential Temporary Economic Impacts Survey

Annexure 10: Labour Management Plan

LMP shall be prepared by the contractor following the requirements of the ESS2 on Labour and Working Conditions. The LMP is a living document, which is initiated early in project preparation, and is reviewed and updated throughout development and implementation of the project. Outline for LMP is provided below which is indicative and shall be made specific to the sub-project.

Description	Mitigation Measures	Responsibility	
		Implementation	Supervision
Applicable Laws	The contractor should ensure the compliance of applicable Indian Labour Laws such as Factories Act 1948, Building and Other Construction Workers Act 1996, Inter State Migrant Workmen Act 1979, Contract Labour (Regulation & Abolition) Act 1970, Workmen Compensation Act 1923, Child Labour (Prohibition & Regulation) Act 1986, Minimum Wages Act 1948, Employee State Insurance Act 1948, Employees Provident Fund Act 1991, Payment of Wages Act 1936, Payment of Bonus Act 1965, Equal Remuneration Act 1976, Payment of Gratuity Act 1972 and other International Labour organization conventions as ratified by India.	Contractor	PIU/PMC
Applicable Licences	Labour Licence and all other statutory work permits including Contract Labour& Interstate Migrant Worker License. Workmen compensation Insurance / Accident Insurance, EPF and ESIC.	Contractor	PIU/PMC
Site layout	Thelocation of the site, designandbasicfacilityprovisioninthelabouraccommodationwill be reviewed and approved by the PIU prior to the construction;	Contractor	PIU/PMC
Facilities	Maintainnecessarylivingaccommodationand ancillary facilities in functional and hygienic conditions; Provide adequate number of toiletsseparate for men and women workers, bathing area, kitchen, safe fuel/LPG for cooking and uncontaminated water for drinking, cooking and washing; Ensure adequate water supply in all toilets and urinals; The labour camp should have protection from heat, rain, flooding, insects, snakes and mosquitoes. It should have adequate provisions for emergency such as fire safety, security, etc;	Contractor	PIU/PMC

Description	Mitigation Measures	Responsibility	
		Implementation	Supervision
	Require the non-discrimination and harassment and should be socialized/basis for training, and covers potential ethnic discrimination.		
Health and Safety	Provide first aid medical kit at labour accommodation; train the labour for usage of items in injury, emergency, coordinate with nearest government and private medical centers for the medical services, display the contact number of medical doctor(s) and keep a vehicle for emergency travel all the time; necessary HIV/AIDS prevention measures will be taken at labour camp; HIV/AIDS awareness program will be organized by the contractor's Environment & Safety Officer; Where feasible, manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas; ULB shall ensure proper segregated storage, collection, transport, treatment and disposal of all wastes following the SWM / C&D waste Rules 2016; remove all wreckage, rubbish, or temporary structures which are no longer required;	Contractor	PIU/PMC
Labour use	The total number of workers to be employed on the project, and the different types of workers: direct workers, contracted workers, temporary or seasonal workers and community workers. (Where numbers are not yet firm, an estimate should be provided) broad description and an indication of the likely characteristics of the project workers e.g. local workers, national or international migrants, female workers, workers between the minimum age and 18; details of the migrant workers, labour camp location should be shared with local Police station as per regulatory norms.	Contractor	PIU/PMC
Grievance	Establish a mechanism for grievance redressal for both direct and contract labourers, disclose contact details of officials concerned. Sign boards and GRC name boards should be written	Contractor	PIU/PMC

Description	Mitigation Measures	Responsibility	
		Implementation	Supervision
	in local, multilingual languages and English at the labour camp.		
Policies and Procedures	Provide workers with contracts with fair terms and conditions Require the contractor to preferentially engage unskilled local workforce form the local communities Make all contracted workers to follow the rules for on-site behaviour (with colleagues) and conduct in the community. Conduct induction and toolbox talks outlining expected conduct and local community values. Introduce disciplinary measures for violations and misbehaviours. Settheminimumageofproject workers eligible for any type for work. Train the labour for environmental protection, occupational and community health and safety and gender equality. Follow the equal wages policy without any discrepancies or gender partialities. Ensure minimum legal labour standards as per ILO regulations (child/forced labour, no discrimination, working hours, minimum wages) are met with. Contractors shall implement codes of conduct concerning employment and workforce behaviour (including but not limited to safety rules, zero tolerance for substance abuse, environmental sensitivity of the area, dangers of sexually transmissible diseases and HIV/AIDS, gender equality and sexual harassment, respect for the beliefs and customs of the populations and community relations in general).	Contractor	PIU/PMC

Annexure 11: Carbon Emission calculation for 350 MLD STP Plant at Kodungaiyur (Two 120 MLD and one 110 MLD)

Description	Direct Emissions	Indirect Emissions	Other Indirect Emissions
Emission t/a	21,165	17,935	3,705
Percentage of total plant emissions	49.4%	41.9%	8.7%

Description	From Direct Emissions	From Indirect Emissions	From other Indirect Emissions
Utilization of biogas through sludge digestion (t/a)	401	-	-
Reduction of purchase of electricity (t/a)	-	4107	-
Green Belt development with 435Spider lilly plant t/a	**12.85**	-	-

The carbon emissions of sewage treatment plants are divided into three parts: direct emissions, indirect emissions, and other indirect emissions.

Direct Emissions:
Direct GHG emissions from sewage treatment plants are mainly CO_2 from the aerobic decomposition and conversion of organic matter in the biological treatment process, CO_2 and CH_4 from the anaerobic digestion process, N_2O from the denitrification process, and direct emissions from other links.

Indirect emissions:
The purchased electricity consumed by the operation of blowers, pumps, aerators and other equipment in the sewage treatment plant generates indirect emissions.

Other indirect emissions:
Indirect GHG emissions from the purchased medicines, purchased raw materials, and fuel transportation consumed by the sewage treatment plant.

The CO_2, CH_4, N_2O and other greenhouse gases emitted by the sewage treatment plant are uniformly measured by the amount of CO_2produced. According to the global warming potential (GWP), the potential value of $CO_2$is 1, and the potential values of $CH_4$and N_2O are 23 and 296 respectively; $CH_4$and N_2O can be converted into carbon emission equivalent according to the corresponding potential values.

Direct emissions
It is the amount of CO_2directly emitted during sewage treatment. According to the "Greenhouse Gas Inventory Protocol-Corporate Accounting and Reporting Standards", in the total GHG emissions, the CO_2emissions of wastewatermust be included.
The calculation formula of CO_2production is:

$$M_{CO_2}=Q*EF_{CO_2}$$

In formula : M_{CO_2} Biological treatment process emissions, in g

Q Amount of sewage treated during calculation, in m^3

EF_{CO_2}The emission factor

Indirect emissions
During the operation of the sewage treatment plant, blowers, pumps, aeration equipment and other equipment consume a large amount of electricity, the carbon emissions of the purchased electricity during the production process are the indirect emissions of the sewage treatment plant, the calculation formula:

$$M_{CO_2 \bullet E}=E*EF_{CO_2 \bullet E}$$

In formula:

$M_{CO_2 \bullet E}$ Indirect CO_2 emissions from power consumption, kg;

E Power consumption, unit: kw/h;

$EF_{CO_2 \bullet E}$ The emission factor of electric energyconsumption, in$kgCO_2/kw \bullet h$

Other indirect emissions

Some chemicals are used in the sewage treatment process, such as disinfectants, flocculants, etc., the formula for calculating carbon emissions of purchased chemicals:

$$MCO_2{\bullet}Y=\sum Yi*EFCO_2{\bullet}Yi$$

In formula:

$MCO_2{\bullet}Y$	Indirect CO_2 emissions from chemicals consumption, in kg;
Yi	Consumption of medicine i, unit: kg;
$EFCO_2{\bullet}Yi$	i The emission factor of CO_2 consumed by chemicals, in kgCO_2/kg.

Each chemicals calculated its CO_2 emissions with corresponding emission coefficients. The emission factor of coagulant is 25kgCO_2/kg of coagulant, and the emission factor of disinfectant is 1.4 kgCO_2/kg of agent.

From the analysis of the GHG emission composition of the whole plant, it can be seen that the GHG directly discharged from the sewage treatment process and the indirect discharge generated by the power consumption are the main emission sources, accounting for 48% and 40.6% of the total discharge of the whole plant respectively. In direct emissions, direct CO_2 emissions accounted for 84.9%, direct emissions of CH_4 accounted for only 9.3%, and N_2O emissions accounted for 5.8%. Among the GHG indirect emissions generated by power consumption, the power consumption of the production process reached 98.2% of the power consumption of the whole plant, and the aeration unit consumed the largest power consumption, which was 52.4% of the power consumption of the whole plant, the power consumption of the three parts of the unit reached 89.3% of the power consumption of the whole plant. Among other indirect emissions, chemical consumption accounts for a relatively low proportion of the plant's GHG emissions.

Mitigation measures:

The process design cause gaps in the composition of GHG emissions, if anaerobic processes are used, CH_4 emissions will increase significantly, and indirect emissions from chemical consumption will also increase significantly. For reducing direct GHG emissions, ecological treatment processes such as stabilizing ponds, constructed wetlands, building greenhouses, cultivating aquatic plants, and planting trees, use plants to absorb nutrients such as nitrogen and phosphorus in sewage, absorb CO_2, and transform into plant bodies. Using the canopy area of the plant and the corresponding carbon fixation coefficient, the amount of GHG recovered by the ecological process can be determined.

CH_4 recovery can be used as energy combustion, on the one hand, the CO_2 produced by combustion has a lower warming potential than the direct emission of CH_4; on the other hand, it can save energy consumption and reduce GHG emissions. If CH_4 can be recycled, it can reduce GHG emissions by 672.57 t/a, and it can also reduce power consumption and reduce costs. Moreover, CH_4 is a renewable energy source, which meets the requirements of the country's low-carbon circular economy development.

Indirect emissions from power consumption accounted for 40.6%, the working effects of blowers, water pumps, aerators and other equipment during operation are carefully designed to reduce inefficient energy consumption and save power consumption.

Annexure 12 Immediate Incident Notification Form

Any Major Incident occurring on the Construction site of the Sub-Projects or caused by the Construction activities shall be reported by the Contractor/ Borrower / PIA to the Project Executing Agency (PEA) as soon as possible and not later than 24 hours after the incident occurred.
Definition of Major Incident:

Any social, labour, health and safety, security or environmental incident or accident having or which would reasonably be expected to have a negative impact on the Project. This may include explosions, fires, spills or workplace accidents which result in serious or multiple injury or major pollution. Any Injury of any employee (of Contractor or subcontractors/ suppliers) that causes loss of working time (Loss Time Injury) is considered as a major Incident.

Guidance for Accidents and Incidents Reporting

1 Basic Information

- *date, time, weather / lighting / conditions*
- *statement of facts*
- *details of deaths, injuries, damage, immediate losses*
- *details of witnesses*
- *details of whether scene was secured / photographed*
- *details of any item tested / sampling / sent for testing / removed from scene*
- *details of person leading investigation*
- *time lapse between accident and investigation*

Basic data should be clear, unambiguous, and factual (i.e. free from interpretation). Any gaps in the data should be highlighted and addressed in the investigation.

2 Investigation

- *reconstructed timeline of events, with the incident/accident in the mid-point, and linked events streamed either side, with clear identification of individuals/teams/third parties (e.g. contractors) that are linked and therefore require interviewing*
- *robust but sensitive questioning of witnesses and linked individuals/third parties to*

- *clarify facts, assist with timeline reconstruction and advance the investigation. Statements/ notes of interviews to be included.*

The investigation must follow the facts, witnesses and linked individuals/third parties and the timeline, and not be constrained by the incident/accident event in isolation.
In case publications on the event are available, these should be attached to the report (e.g. press articles, online articles, radio and TV- spots).

3 Analysis

- *using basic data, interview outcomes and reconstructed timeline, identification of:*
  - *immediate causes*

- *underlying causes (actions in the past that have allowed or caused undetected unsafe conditions/acts)*
- *root causes (generally organisational/management failings, sometimes not directly/ obviously in relation to accident/incident regarding location/time)*
- *identification of absent/inadequate/failed/unused risk identification,- management- and control measures, reference/gap analysis against relevant national legislation and against the international standards as applicable and agreed upon for the Project*

- *conclusions and summary of root causes and underlying causes for the accident/incident.*

Analysis must be sufficiently rigorous to go wherever the investigation has led. Identification of root, underlying and immediate causes must be sufficiently credible and robust to withstand third-party scrutiny.

4 Way forward

- *for EACH root cause, underlying and immediate cause, a corrective/preventive action is required (these may be numerous and interlinked)*
- *for EACH action, a named person with sufficient resource to deliver upon it and a clear timeline (action plan) is required. In addition, a named person should have overall responsibility for monitoring / reporting on progress (with timelines).*
- *demonstration, that all actions together will prevent recurrence; evidence that current risk assessments/procedures have been revised to reflect this*
- *details of communications to stakeholders, to include a concise summary of the investigation, including the action plan, and lessons learned.*
- *details of ongoing support and assistance to those impacted directly or indirectly by the accident.*

Types of reportable injury

The death of any person
All deaths to workers and non-workers, with the exception of suicides, must be reported if they arise from a work-related accident, including an act of physical violence to a worker.
Specified injuries to workers

- fractures, other than to fingers, thumbs and toes
- amputations
- any injury likely to lead to permanent loss of sight or reduction in sight
- any crush injury to the head or torso causing damage to the brain or internal organs
- serious burns (including scalding) which:
  - covers more than 10% of the body
  - causes significant damage to the eyes, respiratory system or other vital organs
- any scalping requiring hospital treatment
- any loss of consciousness caused by head injury or asphyxia
- any other injury arising from working in an enclosed space which:
  - leads to hypothermia or heat-induced illness
  - requires resuscitation or admittance to hospital for more than 24 hours

Source:http://www.hse.gov.uk/riddor/reportable-incidents.htm

IMMEDIATE INCIDENT NOTIFICATION					
1. Incident Details					
Project Company		**Date of incident**			
		Time of Incident			
Location of incident		**Type of Incident**	**Environmental**	☐	
			Injury	*Workforce*	☐
				Public/Local community	☐
			Social incident (e.g. violent labor unrest)	☐	

2. WHAT HAPPENED
Brief description of incident

3. INJURED WORKERS						
Employee / Contractor	**Sex**	**Age**	**Job Title / Description**	**Time with company**	**Cause**	**Injury Type (Major / Fatal)**

4. INJURED MEMBERS OF PUBLIC						
Name	**Sex**	**Age**	**Community**	**Place of Residence**	**Cause**	**Injury Type (Major / Fatal)**

5. ENVIRONMENTAL INCIDENT			
Type (Spill / Gas Release)	**Total Loss (Litres /kG)**	**Cause**	**Damage**

6. WITNESSES TO INCIDENT			
Name	**Sex**	**Place of Residence**	**Description of incident**

7. OTHER RELEVANT INFORMATION				
Have the authorities been informed?	**Yes**	☐	**No**	☐
Please provide further information here				
Media attention?	**Yes**	☐	**No**	☐
Please provide further information here				
Any effects off-site?	**Yes**	☐	**No**	☐
Please provide further information here				
Photographs taken? *(please include them in this report)*	**Yes**	☐	**No**	☐
Date				
Which immediate corrective actions have been taken after the accident? By whom?				
Please describe here if the accident lead to changes into the works organisation or process, if specific equipment has been acquired/mobilised, if protection measures were implemented, if works have stopped etc.				
Person completing form:				

Name and position:				
Contact details:	**Phone**		**Email**	