

**BEFORE THE NATIONAL GREEN TRIBUNAL  
SOUTHERN ZONE, CHENNAI  
Original Application No. 224 of 2025 (SZ)**

**In the matter of:**

Society of Liberals Valuing Environment ... Applicant(s)

Versus

The Tamil Nadu Coastal Zone  
Management Authority and Ors. ...Respondent(s)

**REPORT FILED BY THE 3<sup>RD</sup> RESPONDENT –  
THE WATER RESOURCES DEPARTMENT, ARANIYAR BASIN DIVISION.**

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Through  
Dr. D. Shanmuganathan  
Standing Counsel for Government of Tamil Nadu  
National Green Tribunal  
Southern Zone, Chennai

**DATE: 03.01.2026**

**BEFORE THE HONOURABLE NATIONAL GREEN TRIBUNAL  
SOUTHERN ZONE AT CHENNAI**

**Original Application No. 224 of 2025**

IN THE MATTER OF

Society of Liberals Valuing Environment,  
Uthandi, Chennai.

..... Applicant

Vs

The Executive Engineer, WRD,  
Araniyar Basin Division,  
Chepauk, Chennai-5 and others

..... Respondents

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**Reply Affidavit filed by the 3<sup>rd</sup> Respondent**

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I, **G.Karthigeyan**, Aged about 56 years and officiating as Executive Engineer, WRD, Araniyar Basin Division, Chepauk, Chennai-05 and having office at Chennai, do hereby solemnly affirm and sincerely state as follows.

1. IT IS RESPECTFULLY SUBMITTED THAT I am well acquainted with the facts and circumstances of the case based on the official records and I am duly authorized to file this Reply Affidavit before this Hon'ble Tribunal.
2. IT IS RESPECTFULLY SUBMITTED THAT the Chennai City and its Suburbs are drained by Kosasthalaiyar Basin in the north, Cooum and Adyar Basin in the middle and Kovalam Basin in the south. The Buckingham Canal running parallel to the coast connects all the River mouths in the city and acts as an important flood carrier canal of Chennai city.
3. IT IS RESPECTFULLY SUBMITTED THAT unlike other River Basins, which usually consists of a system of Rivers, major and sub

tributaries draining the entire Catchment area into sea, the Kovalam Minor Basin consists of cascade of Irrigation tanks which carries the surplus runoff through chain of tanks before draining into the Marsh lands (or) Estuaries (or) Buckingham Canal.

4. IT IS RESPECTFULLY SUBMITTED THAT in terms of administrative area, the Kovalam Basin drains Velachery Taluk, Sholinganallur Taluk and parts of Guindy Taluk in Chennai District and Vandalur, Pallavaram, Tambaram, Thiruporur and Thirukazhukundram Taluks of Chengalpattu District.
5. IT IS RESPECTFULLY SUBMITTED THAT the Pallikaranai Swamp, which is a Ramsar site and only Wetland located in the Chennai City plays a significant role in absorbing the flood water of surplus runoff from the upstream 63 Nos. of cascade of Tanks widespread over the northern portion of Kovalam Basin.
6. IT IS RESPECTFULLY SUBMITTED THAT the flood water from the Pallikaranai Swamp drains into Buckingham Canal through Okkiyam Maduvu and then after flowing for nearly 13km drains into the sea at Kovalam Creek, which is one of the only two outlets of entire Kovalam Basin and the other being Kokilamedu mouth located near south of Mamallapuram.
7. IT IS RESPECTFULLY SUBMITTED THAT the entire Kovalam Basin and more significantly, the Catchment of Pallikaranai Swamp receives extremely high rainfall in a very short duration bringing huge inflows into the Pallikaranai Swamp and causing widespread inundation for nearly 2 to 3 days in the abutting fringe areas, that was witnessed during the unprecedented 2015 Chennai Flood and 2023 Michaung Cyclone.
8. IT IS RESPECTFULLY SUBMITTED THAT the apart from the meteorological factors, the topography of the Pallikaranai Swamp makes it extremely vulnerable to flooding due to the fact that the significant land portion adjacent to the Swamp being located in the

range from (+)2.500m to (+)3.500m, which is less than the Swamp's Highest Flood Level (HFL) of (+)3.750m is the primary cause for marooning of fringe areas around the Pallikaranai Swamp in almost every above normal North East Monsoon Rainfall season.

9. IT IS RESPECTFULLY SUBMITTED THAT apart from the natural factors, the anthropological factors has further aggravated the flood vulnerability due to rapid urbanization in the foreshore of Pallikaranai Swamp, because of the fact that the lands which are once used to be vacant pasture and grazing lands accommodating the surplus flood water of Irrigation tanks as sheet flow were now converted into residential areas obstructing the free flow of flood water leading to localized inundation.
10. IT IS RESPECTFULLY SUBMITTED THAT to prevent localized inundation in the upstream of Pallikaranai Swamp mainly caused due to missing hydraulic links between the tanks, the Water Resources Department has taken up various long term flood mitigation measures post 2015 flood to bridge the missing links through macro and micro drain network to drain into the Pallikaranai Swamp without any obstruction. This has resulted in more inflows into the Swamp at a very short duration and hence, it is highly imperative and inevitable to increase the outflow from the Pallikaranai Swamp, to maintain the equilibrium between the inflow and outflow which will ultimately reduce the inundation in the foreshore areas of Swamp.
11. IT IS RESPECTFULLY SUBMITTED THAT when it comes to outflow, the Pallikaranai Swamp is hydraulically connected to South Buckingham Canal via Okkiyam Maduvu and drains into Sea at Kovalam Creek after flowing for nearly 13km through Buckingham Canal.
12. IT IS RESPECTFULLY SUBMITTED THAT in terms of geographical area, the South Buckingham Canal originates at Adyar River and ends at Kazhuveli near Marakkanam by connecting various

intermediate backwaters such as Kovalam Creek, the great salt lake, Kokilamedu mouth, Pudhupattinam mouth and Palar River.

13. IT IS RESPECTFULLY SUBMITTED THAT the Buckingham Canal is a Man-made navigational canal formed during the British era, where its hydraulic performance is highly dependent on the prevailing tide conditions such that the adequate depth will be maintained to facilitate the movement of boats and vessels to convey the Cargo and passengers. Since it is a tidal canal and also exposed to the River confluences and sea outlets, it is highly affected by the Siltation during the Monsoon season and sand bar formation at the River mouths during the non-monsoon season requiring high maintenance cost to desilt the canal and River mouths to facilitate tidal influx into the Canal.
14. IT IS RESPECTFULLY SUBMITTED THAT, though the Canal has now completely lost the interests of navigation, but still it acts as an important flood carrier canal for the entire Chennai city by collecting the flood water from Otteri Nallah, Captain Cotton Canal, Kondungaiyur drain and Pallikaranai Swamp.
15. IT IS RESPECTFULLY SUBMITTED THAT during the Cyclone induced incessant Rainfall events, the Buckingham Canal must drain out the huge outflows from the Pallikaranai Swamp coupled with the high tidal surge from the Sea naturally creates a backwater effect resulting in the swelling of Buckingham Canal to a catastrophic level and exacerbates the time lag for discharging major portion of flood water received at Okkiyum Maduvu causing delayed flood relief to the fringe areas of Pallikaranai swamp. To mitigate the flooding, desilting and deepening of the Canal would only facilitate tidal exchange and would not increase the flood discharge capacity of the Canal and hence requires a paradigm shift in mooting out the flood control measures in tandem with the prevalent site conditions.
16. IT IS RESPECTFULLY SUBMITTED THAT a comprehensive Numerical Flood Modeling Studies were conducted simulating the entire catchment of Pallikaranai Swamp upto its confluence at Kovalam

Creek by incorporating the existing Land Use Land Classification, Soil Parameters and delineating all the major and micro drains in the model study. Based on the study results, it is observed that there is an outflow of 8,560 Cusec from the Pallikaranai swamp to Buckingham Canal, which is much higher than the safe discharge capacity of South B' Canal of just 7,050 Cusec causing flood inundation in the fringe areas of Pallikaranai Swamp and adjacent lands of the South Buckingham Canal. Also, it is found from the study that the Maximum Flood Level (M.F.L) of the Pallikaranai swamp is MSL (+)3.750m, which is higher than the natural ground level of the residential areas in the fringe areas of the swamp varying between MSL (+)2.500m to (+)3.500m is the reason for flooding and prolonged inundation. The overall area of flood vulnerability as per the study is shown in the table below. (Flood Vulnerability Map attached as Annexure-)

<b>Flood Level (MSL)</b>	<b>Location of Inundation</b>	<b>Area of Inundation (Ha.)</b>
(+)2.500m to (+)3.000m	Narayanapuram, Kamakoti Nagar, Sai Balaji Nagar, Sai Ganesh Nagar, Karapakkam, Akkarai	442.69
(+)3.000m to (+)3.500m	Perumbakkam Priyadarshini Nagar, Arasankazhani	242.37
(+)3.500m to (+)4.000m	Velachery Vijaya Nagar, Ram Nagar, AGS Colony, Semmanjery	522.03
	<b>Total Area of Inundation</b>	<b>1207.09 Ha.</b>

17. IT IS RESPECTFULLY SUBMITTED THAT the outcome of the Numerical Model Analysis indicates that the only possible way of reducing the flood vulnerability is to bring down the Maximum Flood Level (M.F.L) of the Pallikaranai swamp and South Buckingham Canal through

increasing the flood discharge capacity by formation of Flood Escape Channels from the Buckingham Canal directly to Sea. This ensures that a portion of Flood water can be diverted from the South Buckingham Canal to Sea via flood escape channels which will avert the long drainage distance upto Kovalam Creek for 13 Km and also minimizes the impact of tidal and cyclonic storm surge conditions in draining the flood waters. By lowering the M.F.L of Pallikaranai Swamp, the hydraulic performance of all the major channels and urban storm water drains directly linked to the Pallikaranai Swamp will be significantly improved by reducing the localized inundation. Hence, it is highly imperative and need of the hour to improve the outflow from the Pallikaranai swamp.

18. IT IS RESPECTFULLY SUBMITTED THAT with the above scope and objective, the Water Resources Department has proposed four numbers of Straight Cut Flood Escape Channels from the South Buckingham Canal to Sea at Neelankarai, Injambakkam, Akkarai and Uthandi. Subsequently, during the site reconnaissance and feasibility analysis, the location of Uthandi was selected due to the South Buckingham Canal lying very close proximity to Sea such that the length of Construction of Flood Escape channel would be minimum and also there is no land acquisition involved.
19. IT IS RESPECTFULLY SUBMITTED THAT the Government of Tamil Nadu vide **G.O. (D) No.69, Water Resources (I.Spl-2) Department dated 20.06.2025** has accorded the administrative sanction for the work **"Construction of Straight Cut Flood Escape Channel from South Buckingham Canal near Okkiyam Maduvu to Sea in Chennai District for flood relief to fringe areas around Pallikaranai Swamp"** at an estimated cost of Rs.91.00 Cr at Uthandi Village in Sholinganallur Taluk of Chennai District. The main scope of this project is to reduce the M.F.L of Pallikaranai Swamp by

increasing the flood carrying capacity through Flood escape channel with a discharge capacity of 550 Cusec.

20. IT IS RESPECTFULLY SUBMITTED THAT the proposed project involves construction of an underground Flood Escape Conduit of twin vents of each vent size 3.00m X 2.00m for a length of 1050m along the VGP 2nd Main road portion and Construction of a Twin Vent Head Regulator with each vent size of 3.20m x 2.50m adjacent to the Buckingham Canal at LS 15500m near Indian Maritime University High Level Bridge in Uthandi for regulation of flood water into the Flood Escape Drain. Also, the proposed alignment of the underground Flood Escape Conduit will be completely under the existing Road without any dislocation of Residents.
21. IT IS RESPECTFULLY SUBMITTED THAT the proposed flood escape channel would be only operated during the North East Monsoon Season of 3 months from October – December and particularly during very high rainfall event depending on the M.F.L of Pallikaranai Swamp and the level of flood escape channel at the South Buckingham Canal off-take is fixed in such a way that it will prevent any entry of suspended solids and other floating debris by installing a trash rack at the Head Regulator structure.
22. IT IS RESPECTFULLY SUBMITTED THAT since the proposed flood escape channel connects the South Buckingham Canal to Sea, it is very much influenced by the high tides and storm surge that may affect the hydraulic performance of the conduit due to submergence or backwater effect. Hence to avoid these conditions, the technical support from the National Institute of Ocean Technology (N.I.O.T) was sought with Work Order issued for fixing the invert levels of the channel well above the observed Astronomical High Tide Level such that the efficiency of the conduit is ensured to perform at its fullest capacity.

23. IT IS RESPECTFULLY SUBMITTED THAT the N.I.O.T has carried out the DGPS Survey by transferring the accurately known GTS Benchmarks located at Anna University Campus, Guindy and Regional Meteorological Centre, Nungambakkam to the project site. Based on this the invert levels of the conduit were fixed at MSL (+)1.500m at the entry and MSL (+)1.200m at the exit near Sea which is 0.33m above the observed High Tide Level of MSL (+)0.870m / Chart Datum (+)1.520m. This will ensure the negligible effect of storm surge on the proposed flood escape channel.
24. IT IS RESPECTFULLY SUBMITTED THAT the Institute of Ocean Management, Anna University was awarded with a Work Order to conduct an Independent Water Quality Analysis of South Buckingham Canal near the proposed project site and also the Marine Water analysis at Uthandi. The Water Quality Analysis was so far conducted during both the Pre-Monsoon and Monsoon seasons at 3 Nos. of locations in the South Buckingham Canal (at project site, 500m upstream and 500m downstream in the South Buckingham Canal) and 3Nos. of locations in the Sea near Uthandi Beach (at immediate outfall, 500m North and 500m South of proposed outfall). The result of Water Quality Analysis clearly indicates that it conforms to all the permissible levels as per the IS 2296 and CPCB standards. The Institute of Ocean Management, Anna University has confirmed that the diversion of the portion of flood water into Sea would no way affect the marine water and its eco-system. The allegations of the applicant about the Sewage in the Buckingham Canal were cited taking the references of newspaper articles mentioning about the Central and North Buckingham Canal.
25. IT IS RESPECTFULLY SUBMITTED THAT the proposed diversion of flood water from the South Buckingham Canal would not degrade the Marine water quality at Uthandi, since it is the same portion of flood water draining into the Kovalam Creek for so many centuries without

affecting the water quality of Sea water and even awarded the Blue Flag beach certification for the 6<sup>th</sup> consecutive year.

26. IT IS RESPECTFULLY SUBMITTED THAT the proposed construction of Flood Escape Conduit will be a Reinforced Cement Concrete (RCC) Structure of M30 Grade Concrete and will be completely water tight. Also since the Water Quality of proposed diversion of Flood water from the South Buckingham Canal is within the permissible standards, there will be no adverse impact on the local Ground Water Quality.
27. IT IS RESPECTFULLY SUBMITTED THAT the tender for the proposed work was conducted on 15.07.2025 which was followed by the approval of 76<sup>th</sup> Tender Award Committee and the Work Order was issued to M/s.P & C Projects Private Limited, P & C Towers, 2<sup>nd</sup> Floor, No.140, Perundurai Road, Erode-638011 on 30.07.2025. Subsequently, the Hon'ble Deputy Chief Minister of Tamil Nadu has laid the foundation stone at the project site on 05.08.2025.
28. IT IS RESPECTFULLY SUBMITTED THAT the information about the proposed project was disseminated to the residents of Uthandi in the form of wall posters and at common public places in the locality on 28.08.2025 and also a Public hearing meeting was conducted in Uthandi with the Residents and local fishermen to appraise about the project details.
29. IT IS RESPECTFULLY SUBMITTED THAT the overall area of the project construction is 8800 Sqm which includes 8600 Sqm of Flood Escape Channel and 200 Sqm of Head Regulator near South Buckingham Canal. With an objective to complete the significant portion of work before the North East Monsoon Season 2025, the works such as alignment fixation and construction of Head Regulator portion was commenced on 06.09.2025 by keeping the safe buffer distance of 15m from the South Buckingham canal, which was believed to be Non-CRZ area.

30. IT IS RESPECTFULLY SUBMITTED THAT the Institute of Remote Sensing, Anna University was awarded the Work Order vide Lr.No.... to prepare the basic level CRZ mapping for the proposed project and subsequently, the officials from Institute of Remote Sensing visited the site on 23.10.2025 for collecting the Co-ordinates of proposed Project alignment during which it was seen that the co-ordinates of the Flood Escape Channel falls in CRZ-II for 500m from the Seaward side and 30.16m from the South Buckingham Canal on landward side including the work commenced portion of Head Regulator portion.
31. IT IS RESPECTFULLY SUBMITTED THAT upon knowing the work commenced portion of Head Regulator falls in the CRZ-II boundary, the entire work was immediately stopped in the site on 15.10.2025 and no further work will be taken up until the Coastal Regulation Zone (CRZ) clearance is accorded for the said project. Apart from the Head Regulator portion, no other works in both CRZ and non-CRZ areas were started without any violation of Environmental norms and regulations.
32. IT IS RESPECTFULLY SUBMITTED THAT as per the CRZ Report furnished by the Institute of Remote Sensing, the overall length of the project is 1046.87m in which 530.16m falls in CRZ-II and 516.71m outside CRZ boundary. The RCC Flood escape conduit with appurtenances will be completely terminated within the CRZ-II boundary and any kind of hard structures will not be constructed in the CRZ-IA. It is submitted that since the proposed flood escape channel would be operated only during the North East Monsoon Season from October to December and more specifically during the H.F.L of South Buckingham Canal rises above MSL (+)1.500m. Also, the Wildlife Warden, Guindy has submitted that the 2 Nos. of Olive Ridley Nesting sites were observed in the year 2021-22 and 5 Nos. of Nesting sites in the year 2023-24 on the southern side of proposed project site. Since the Olive Ridley nesting season usually starts late

December and ends at May every year for the Tamil Nadu coast, the schedule of operation of Flood Escape channel will be stopped well before the nesting season and the beach will be restored to its original condition without any hindrance to the Olive Ridley turtle nesting.

33.IT IS RESPECTFULLY SUBMITTED THAT the National Institute of Ocean Technology was entrusted to conduct the study on shoreline analysis for the operation of Flood escape channel and any recommendations suggested by the N.I.O.T will be strictly followed for erosion mitigation by soft measures like beach nourishment and Bio-Plantation.

34.IT IS RESPECTFULLY SUBMITTED THAT the application seeking Coastal Regulation Zone Clearance was uploaded (Proposal No.IA/TN/CRZ/561046/2025) in the Parivesh portal on 10.12.2025 along with all the necessary documents as per the CRZ Notification, 2011 and the proposal is under scrutiny with the Tamil Nadu State Coastal Zone Management Authority.

35.IT IS RESPECTFULLY SUBMITTED THAT the work will be resumed only after obtaining the Coastal Regulation Zone clearance from the competent authority and the recommendations of CRZ clearance will be strictly complied.

Solemnly affirmed and signed before me on this 26<sup>th</sup> Day of  
December 2025 at Chennai

  
Executive Engineer, WRD,  
Araniyar Basin Division,  
Chepauk, Chennai-05.

RESTRICTED DOCUMENT

Ref No. AU/IRS/KSR/Q820925-10190/270-2025-26 Dt.14.11.2025

***Preparation of Local Level CRZ Map for the Proposed Construction of Straight Cut Flood Escape Channel from South Buckingham Canal near Okkiyam Maduvu to Sea in Chennai District, Tamil Nadu for Flood Relief to Fringe areas around Pallikaranai Swamp by Superimposing on Approved CZMP as per CRZ Notification 2011***

**SPONSORED BY**

**The Executive Engineer, WRD  
Araniyar Basin Division  
Chepauk, Chennai 600 005**

**Prepared by**

**INSTITUTE OF REMOTE SENSING  
ANNA UNIVERSITY, CHENNAI-25**

**November 2025**



NO.AU/IRS/KSR/Q820925-10190/270-2025-26 Dt.14.11.2025

### Project Data Sheet

Title	Preparation of Local Level CRZ Map for the Proposed Construction of Straight Cut Flood Escape Channel from South Buckingham Canal near Okkiyam Maduvu to Sea in Chennai District, Tamil Nadu for Flood Relief to Fringe areas around Pallikaranai Swamp by Superimposing on Approved CZMP as per CRZ Notification 2011
Project Ref No.	AU/IRS/KSR/Q820925-10190/270-2025-26 Dt.14.11.2025
Funded by	The Executive Engineer, WRD, Araniyar Basin Division, Chepauk, Chennai 600 005
Principal Consultant	Dr. K.Srinivasa Raju, Professor
Field Survey & Mapping	Mr.S.Dineshkumar., IRS, AU Mr.S.Sathishkumar, IRS,AU Mr.J.Premkumar, IRS,AU
Report Preparation	Dr. K.Srinivasa Raju, Professor
Quality Assessment	Dr.C.Udhayakumar, Professor
<p>The Quality Assessment Committee for consultancy projects has scrutinized the local level CRZ map and corresponding text report of the above project on 14.11.2025. The principal consultant of the project has presented the approach adopted, findings of the study to the committee. The committee has evaluated the CRZ Map and the report for different parameters against the standards prescribed for the mapping. The positional accuracy, attribute accuracy, completeness, semantic accuracy of the output were assessed and found satisfactory. The committee recommends the approval of the map and associated report</p>	
<p> Dr. K.Srinivasa Raju (Principal Consultant)</p>	
<p> Dr.C.Udhayakumar (QAC Member)</p>	
<p> DIRECTOR, IRS Director</p>	

Institute of Remote Sensing  
Anna University,  
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### **Executive Summary**

Institute of Remote Sensing, Anna University, Chennai has taken up the task of preparing a local level Coastal Regulation Zone (CRZ) map in the vicinity of the proposed construction of straight cut flood escape channel from South Buckingham Canal near Okkiyam Maduvu to Sea in Chennai district, Tamil Nadu for flood relief to fringe areas around Pallikaranai Swamp by superimposing on approved CZMP as per CRZ Notification 2011 at the request of the Executive Engineer, Water Resources Department (WRD), Araniyar Basin Division, Chepauk, Chennai 600 005. The objective of the project is to superimpose the proposed construction of a straight cut flood escape channel from South Buckingham Canal near Okkiyam Maduvu to Sea in Chennai district, Tamil Nadu for flood relief to fringe areas around Pallikaranai Swamp on approved CZMP (Map Nos. TN 104,105, 106 & 107) for Chennai district. The satellite imagery of the project area was analysed for geomorphic characteristics in the vicinity of the project site. The project site in Uttandi village falls near Buckingham Canal and Bay of Bengal as per the details provided by the client and falls partly inside CRZ-II as per approved CZMP.

The client, Executive Engineer, Water Resources Department (WRD), Araniyar Basin Division, Chepauk, Chennai 600 005 was requested to identify the project site in Uttandi village and to provide the details of the proposed construction with drawings. The HTL, LTL, ecologically sensitive areas indicated in approved CZMP with setback lines as per CRZ Notification 2011 were superimposed onto the georeferenced cadastral map to prepare a local level CRZ map at 1:4,000 scale. The proposed project details as provided by the client was superimposed on the georeferenced ward map. The proposed construction of the straight cut flood escape channel from South Buckingham Canal near Okkiyam Maduvu to Sea in Chennai district, Tamil Nadu falls partly between HTL and 100 m setback line from HTL. Hence the proposed construction of the straight cut flood escape channel from South Buckingham Canal near Okkiyam Maduvu to Sea in Chennai district, Tamil Nadu falls partly inside CRZ-II with remaining area outside CRZ as per approved CZMP.



## 1.0 INTRODUCTION

### 1.1 Coastal Regulation Zone

The coastal zone is the area of interaction between land and sea. The coastal Zone of Tamil Nadu has a very high concentration of population along with ecologically sensitive areas like mangroves. There is a spurt of developmental activities arising from huge residential colonies, new industries and tourism centres along the coast and in the coastal zone. There is a need to protect the coastal environment while ensuring continuing production and development. This zone is extremely vulnerable and has to be managed judiciously striking a balance between ecological and developmental needs.

The Ministry of Environment and Forest in the CRZ Notification, 2011 declared the following areas as CRZ and imposed with effect from the date of the notification the restrictions on the setting up and expansion of industries, operations or processes and the like in the CRZ. The areas that are defined as CRZ as per CRZ Notification, 2011 are

(i) The land area from High Tide Line (HTL) to 500mts on the landward side along the seafront.

(ii) CRZ shall apply to the land area between HTL to 100 meters or width of the creek whichever is less on the landward side along the tidal influenced water bodies that are connected to the sea and the distance upto which development along such tidal influenced water bodies is to be regulated shall be governed by the distance upto which the tidal effects are experienced which shall be determined based on salinity concentration of 5 parts per thousand (ppt) measured during the driest period of the year and distance upto which tidal effects are experienced shall



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be clearly identified and demarcated accordingly in the Coastal Zone Management Plans.

(iii) The land area falling between the hazard line and 500mts from HTL on the landward side, in case of seafront and between the hazard line and 100mts line in case of tidal influenced water body the word 'hazard line' denotes the line demarcated by Ministry of Environment and through the Survey of India taking into account tides, waves, sea level rise and shoreline changes.

(iv) Land area between HTL and Low Tide Line (LTL) which will be termed as the intertidal zone.

(v) The water and the bed area between the LTL to the territorial water limit (12 Nm) in case of sea and the water and the bed area between LTL at the bank to the LTL on the opposite side of the bank, of tidal influenced water bodies.

The Classification of the CRZ is also modified for the purpose of conserving and protecting the coastal areas and marine waters as CRZ – I, CRZ – II, CRZ – III and CRZ – IV. The CRZ – I include the areas that are ecologically sensitive and the geomorphological features which play a role in the maintaining the integrity of the coast like (a) Mangroves(b) Corals and coral reefs and associated biodiversity (c) Sand Dunes (d) Mudflats which are biologically active (e) National parks, marine parks, sanctuaries, reserve forests, wildlife habitats and other protected areas (f) Salt Marshes (g) Turtle nesting grounds (h) Horseshoe crabs habitats (i) Seagrass beds (j) Nesting grounds of birds (k) Areas or structures of archaeological importance and heritage sites and the area between Low Tide Line and High Tide Line. The CRZ-II includes areas that have been developed upto or close to the shoreline. The CRZ-III includes areas that are relatively undisturbed and those that do not belong to either CRZ-I or II, which include coastal zone in the rural areas (developed and



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undeveloped) and also areas within municipal limits or in other legally designated urban areas, which are not substantially built up. The CRZ-IV includes the water area from the Low Tide Line to twelve nautical miles on the seaward side and the water area of the tidal influenced water body from the mouth of the water body at the sea upto the influence of tide which is measured as five parts per thousand during the driest season of the year.

The Ministry of Environment and Forest has also provided guidelines for demarcation of High Tide Line in the CRZ Notification, 2011. As per the guidelines, Cadastral maps in 1:3960 or the nearest scale shall be used as the base maps. HTL, LTL will be demarcated by NCSCM, Chennai is used for superimposition on the cadastral map based on physical verification using geomorphological signatures or features in accordance with the approved CZMP maps.

In order to facilitate classification of Coastal Regulation Zones Government of India has approved few agencies/institutions across the Country vide Lr. No. J17011/8/92-1A III, dated 10.05.1999 of the Ministry of Environment and Forests. Institute of Remote Sensing, Anna University being one of them, has been carrying out HTL, LTL mapping following the guidelines issued by the Ministry of Environment & Forests, Government of India.

## 1.2 Background

The client, Executive Engineer, Water Resources Department (WRD), Araniyar Basin Division, Chepauk, Chennai 600 005 has requested Institute of Remote Sensing, Anna University to prepare local level CRZ map for the proposed construction of straight cut flood escape channel from South Buckingham Canal near Okkiyam Maduvu to Sea in Uttandi village, Chennai district, Tamil Nadu along with



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HTL, LTL for the Sea/Bay/tidal influenced water bodies and ecologically sensitive areas on 1:4,000 scale cadastral map in the vicinity of project site. The project site falls adjacent to the Buckingham Canal and Bay of Bengal. In this context, the site needs to be evaluated to assess whether it falls under regulations of CRZ Notification, 2011. Hence IRS has taken up the work of superimposing property on approved CZMP.

### 1.3 Objectives

The objective of the study is to examine the proposed project site of the Executive Engineer, Water Resources Department (WRD), Araniyar Basin Division, Chepauk, Chennai 600 005 with reference to CRZ Notification, 2011. Keeping in view of the requirements of notification, Institute of Remote Sensing, Anna University undertook the project with scope of work:

- Transfer of HTL, LTL for Buckingham Canal and Bay of Bengal indicated in approved CZMP (Map Nos.TN 104,105, 106 & 107) in Uttandi village from approved CZMP at 1:25,000 scale onto cadastral map.
- Digitisation of ecologically sensitive areas such as Mangroves, Sand dunes, as indicated on approved CZMP in the vicinity of aforesaid property
- Superimposition of HTL, LTL, Ecologically Sensitive Areas along with the property as provided by the client on to the georeferenced cadastral map
- Preparation of local level CRZ map for the proposed flood escape channel on cadastral map of Uttandi village, Chennai district, Tamil Nadu at 1:4000 scale and CZMP at 1:25,000 scale for 7 km radius around the site



#### **1.4 Data Products**

The approved CZMP prepared as per CRZ Notification 2011 and published by TNSCZMA, Chennai were collected from the client/authority and used as reference for transfer of HTL, LTL and ecologically sensitive areas in the vicinity of proposed road onto local level CRZ map. The data products used for the study include approved CZMP published by TNSCZMA (Map Nos. TN 104,105, 106 & 107) in 2018 vide CRZ Notification 2011 and map of Uttandi villages, Chennai district for preparation of approved CZMP.

#### **1.5 Methodology**

The cadastral map of the Uttandi village provided on approved CZMP has been used for the preparation of local level CRZ map. The geomorphic characteristics of the coastal zone have been analysed from the medium resolution satellite data. The coastal geomorphological features and the existence of permanent vegetation identified from the satellite imagery were used to transfer the HTL demarcated by NCSCM on approved CZMP. The approved CZMP was georeferenced using graticules on the maps.

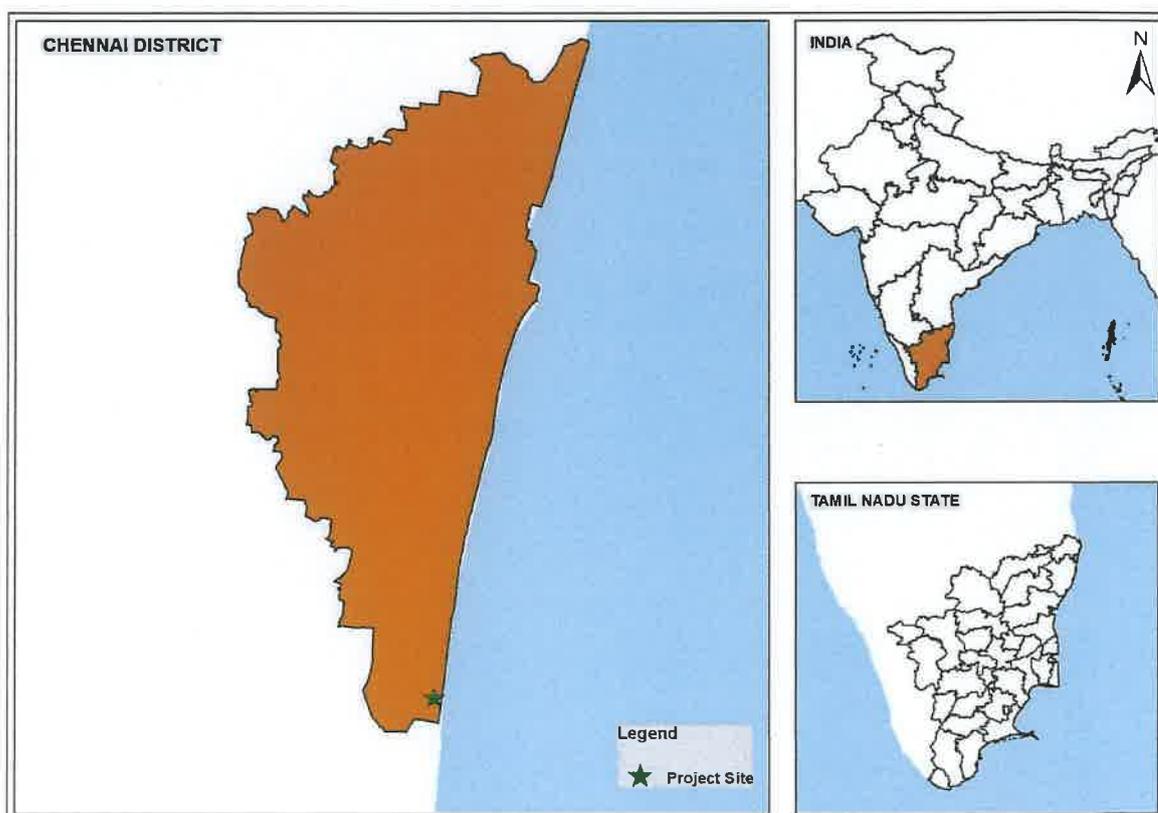
The cadastral map of the Uttandi village was digitized to create a vector dataset of survey polygons in the vicinity of project location. The same is superimposed on satellite imagery to identify the proposed project location. The HTL, LTL and ecologically sensitive areas in the vicinity of the project location are digitized from georeferenced approved CZMP and are transferred on to local level CRZ map. 100m/ width of creek setback line from HTL of Buckingham Canal and 500m setback line from HTL of Bay of Bengal are generated using the buffering tool available in GIS. The zones between LTL, HTL and setback lines are designated as CRZ-IA, IB, II, III, IVA and IVB as per CRZ Notification 2011.



## 2.0 STUDY AREA

### 2.1 Description of Study Areas

The project site of the Executive Engineer, Water Resources Department (WRD), Araniyar Basin Division, Chepauk, Chennai 600 005 for the construction of proposed construction of straight cut flood escape channel from South Buckingham Canal near Okkiyam Maduvu to Sea in Chennai district, Tamil Nadu for flood relief to fringe areas around Pallikaranai Swamp falls in Uttandi village Chennai district, Tamil Nadu. The site falls adjacent to Bay of Bengal and Buckingham Canal and has a width of 7.5m as per the details provided by the client.



**Fig. 1 Location Map of Project Area**

The coordinates of significant points along the straight cut flood escape channel as identified by the client during field observations using dual frequency GPS and layout provided the client are presented in Table 1.



**Table 1 Coordinates of the Proposed Flood Escape Channel**

Label	Latitude	Longitude
A	12° 52' 21.716" N	80° 14' 30.744" E
B	12° 52' 21.141" N	80° 14' 35.204" E
C	12° 52' 18.067" N	80° 14' 35.351" E
D	12° 52' 13.237" N	80° 14' 49.968" E
E	12° 52' 9.990" N	80° 15' 0.995" E

## 2.2 Status as per Approved CZMP prepared by NCSCM, Chennai

The proposed construction of straight cut flood escape channel from South Buckingham Canal near Okkiyam Maduvu to Sea in Uttandi village, Chennai district, Tamil Nadu falls party between HTL and 100m setback line from HTL of Buckingham Canal, HTL and 500m setback line HTL of Bay of Bengal as per approved CZMP (Map Nos. TN 104,105, 106 & 107). Hence, the proposed construction of straight cut flood escape channel from South Buckingham Canal near Okkiyam Maduvu to Sea in Chennai district, Tamil Nadu for flood relief to fringe areas around Pallikaranai Swamp falls partly inside CRZ-II with remaining area outside CRZ as per approved CZMP map prepared vide CRZ Notification 2011.



## 3.0 RESULTS AND CONCLUSIONS

### 3.1 Results

The cadastral map of Uttandi village was georeferenced using tic points available on approved CZMP of Chennai district, Tamil Nadu. The HTL and LTL for Bay of Bengal, Buckingham Canal as indicated in approved CZMP were superimposed onto a georeferenced cadastral map along with ecologically sensitive areas in the vicinity of the project site. Setback lines for 500m from HTL of Bay of Bengal, 100m/ width of creek, whichever is less from HTL of Buckingham Canal was generated and superimposed onto a georeferenced base map to prepare local level CRZ map at 1:4,000 scale (Annexure III). The satellite imagery of the project site is presented for reference (Annexure I). The coordinates of points on the HTL line derived from approved CZMP are presented in Annexure II. The project site is superimposed onto the approved CZMP and CZMP map for a 7km radius around the project site at 1:25,000 scale as presented in Annexure IV and Annexure V.

### 3.2 Conclusions

- The proposed construction of straight cut flood escape channel from South Buckingham Canal near Okkiyam Maduvu to Sea in Uttandi village, Chennai district, Tamil Nadu falls party between HTL and 100m setback line from HTL of Buckingham Canal, HTL and 500m setback line HTL of Bay of Bengal as per approved CZMP (Map Nos. TN 104,105, 106 & 107). Hence, proposed straight cut flood escape channel falls partly inside CRZ-II with remaining area outside CRZ as per approved CZMP map prepared vide CRZ Notification 2011.

  
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- The length of proposed construction of straight cut flood escape channel in various CRZ is presented in Table 2.

**Table 2 Length of Proposed Flood Escape Channel in various CRZ**

CRZ - Classification	Length in Metres
CRZ - II	530.16
Outside CRZ	516.71
<b>Total</b>	<b>1046.87</b>

- Coastal Regulation Zone map of the site is prepared considering approved CZMP as per CRZ Notification 2011 of MoEFCC, Gol
- Superimposition of approved CZMP is subject to scale and generalisation error
- The DGPS Survey was carried out specific to the referred project site boundary only hence, validation of HTL and CRZ boundary is limited to the clearance of the same.
- Institute of Remote Sensing do not carry responsibility for CRZ status of other plots or neighborhood.

  
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## ANNEXURE I

### Satellite Imagery of Project Site



(courtesy: Google Earth)



## ANNEXURE II

### Coordinates of HTL Reference Points

Point No	Latitude	Longitude
1	12° 52' 32.993" N	80° 15' 05.052" E
2	12° 52' 22.499" N	80° 15' 03.535" E
3	12° 52' 14.104" N	80° 15' 02.233" E
4	12° 52' 03.049" N	80° 15' 01.385" E
5	12° 51' 55.743" N	80° 15' 00.371" E
6	12° 52' 07.018" N	80° 14' 22.481" E
7	12° 52' 15.542" N	80° 14' 27.856" E
8	12° 52' 24.933" N	80° 14' 30.576" E
9	12° 52' 32.061" N	80° 14' 29.620" E
10	12° 52' 27.891" N	80° 14' 28.568" E
11	12° 52' 17.476" N	80° 14' 27.098" E
12	12° 52' 10.711" N	80° 14' 22.778" E
13	12° 52' 13.661" N	80° 14' 23.022" E
14	12° 52' 21.454" N	80° 14' 28.139" E
15	12° 52' 32.274" N	80° 14' 26.485" E
16	12° 52' 29.483" N	80° 14' 24.206" E
17	12° 52' 20.439" N	80° 14' 26.034" E
18	12° 52' 14.784" N	80° 14' 19.913" E

(Source: Approved CZMP – Map Nos. TN 104,105, 106 & 107)

  
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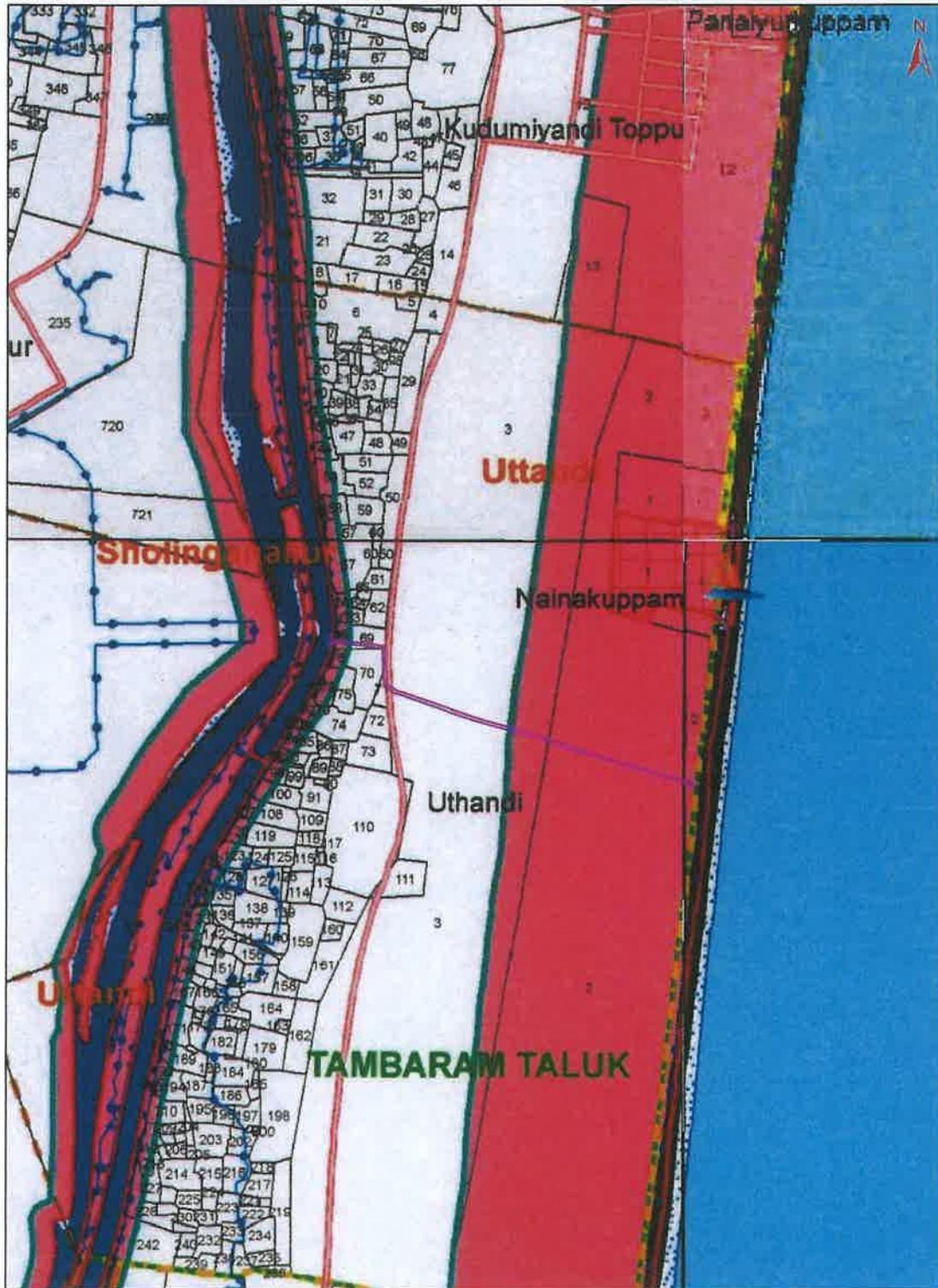


Preparation of Local Level CRZ Map for the Proposed Construction of Straight Cut Flood Escape Channel from South Buckingham Canal near Okkiyam Maduvu to Sea in Chennai District, Tamil Nadu for Flood Relief to Fringe areas around Pallikaranai Swamp by Superimposing on Approved CZMP as per CRZ Notification 2011

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## ANNEXURE IV

### Proposed Project Site Superimposed on Approved CZMP



Source: Approved CZMP – Map Nos. TN 104,105, 106 & 107



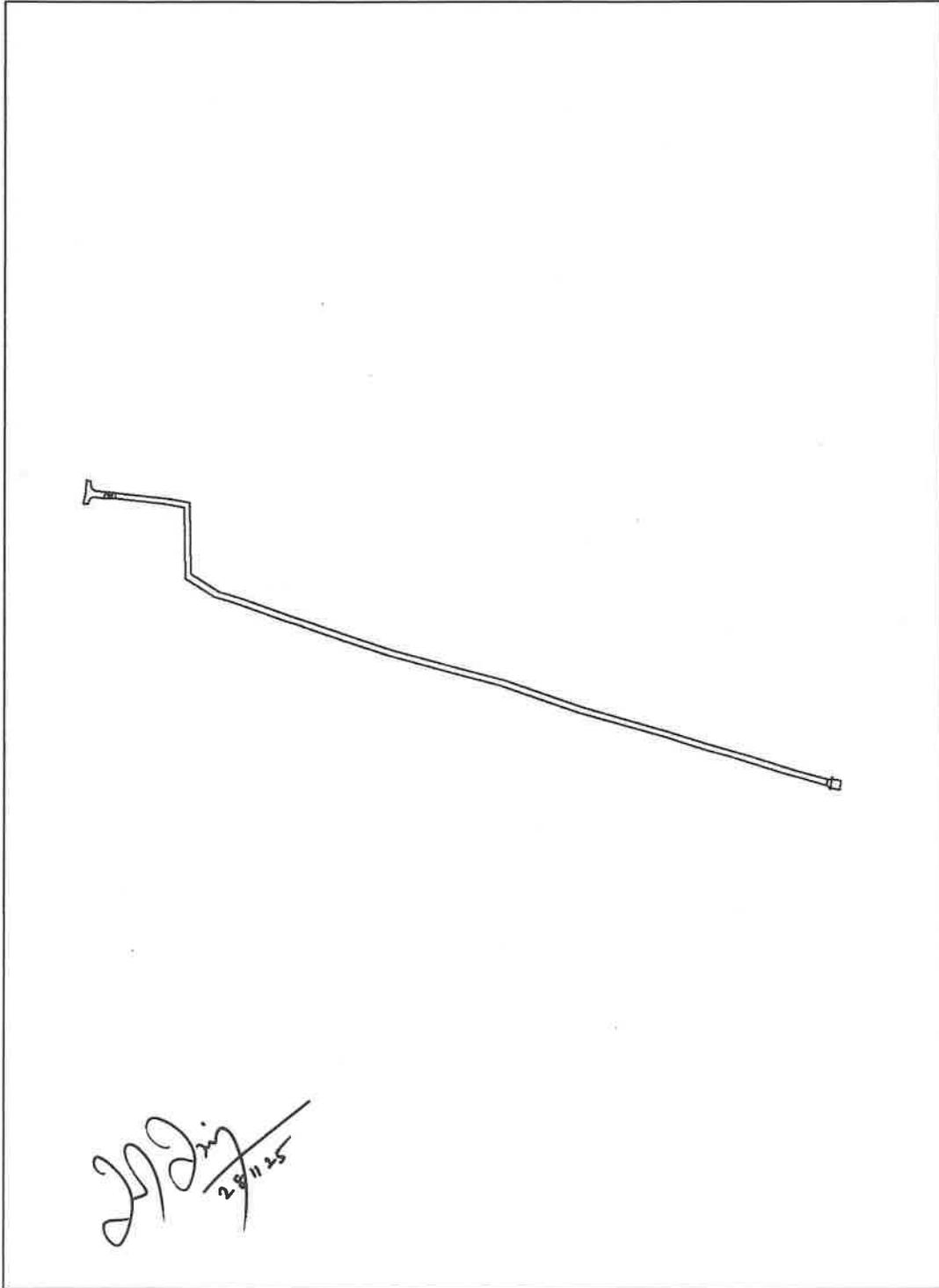


Preparation of Local Level CRZ Map for the Proposed Construction of Straight Cut Flood Escape Channel from South Buckingham Canal near Okkiyam Maduvu to Sea in Chennai District, Tamil Nadu for Flood Relief to Fringe areas around Pallikaranai Swamp by Superimposing on Approved CZMP as per CRZ Notification 2011

NO.AU/IRS/KSR/Q820925-10190/270-2025-26 Dt.14.11.2025

## ANNEXURE VI

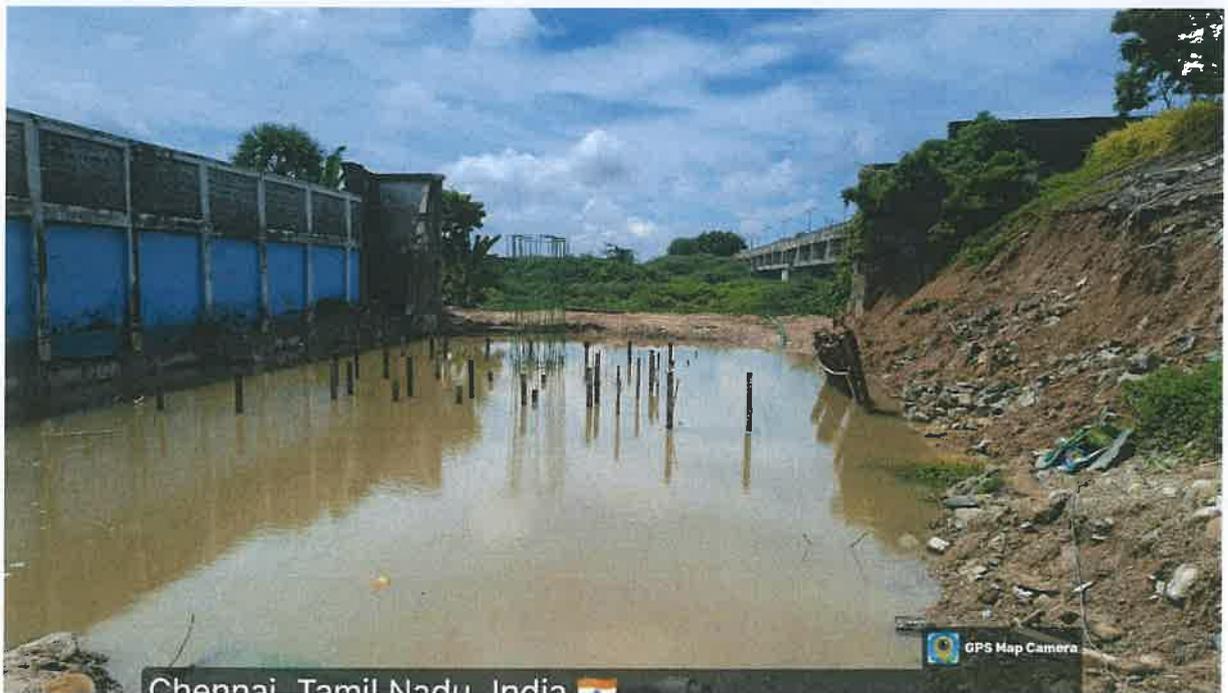
### Project Layout as Provided by the Client



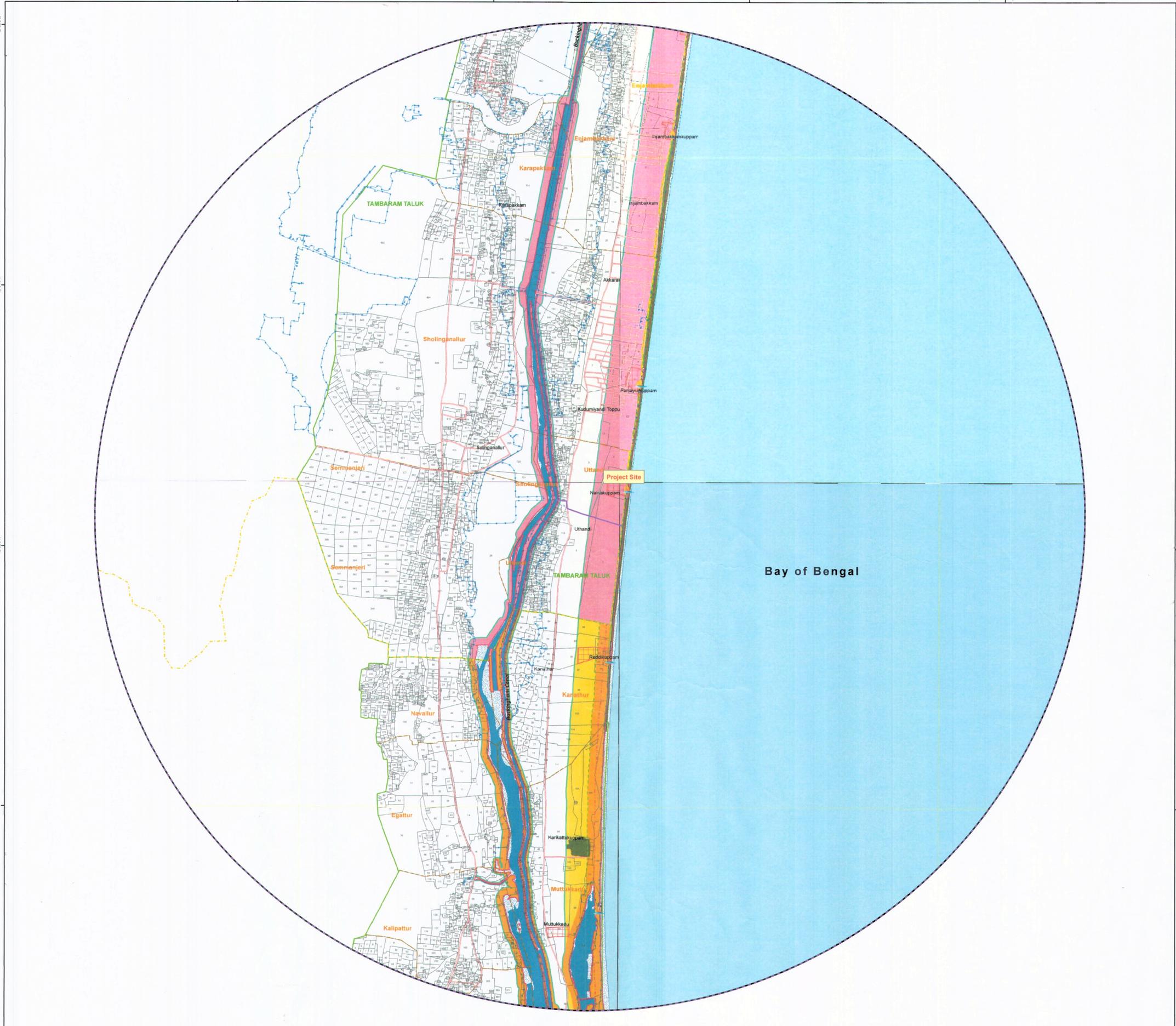


## ANNEXURE VII

### Field Photographs



# Superimposing the Proposed Construction of Straight Cut Flood Escape Channel from South Buckingham Canal near Okkiyam Maduvu to Sea in Chennai District, Tamil Nadu for Flood Relief to Fringe areas around Pallikaranai Swamp on Approved CZMP as per CRZ Notification 2011 for 7Km Radius



**LEGEND**  
SOURCE : APPROVED CZMP (MAP NOS : TN 104, 105, 106 & 107)  
AS PER CRZ NOTIFICATION 2011

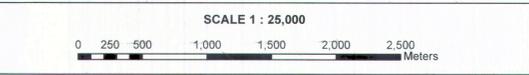
- Lighthouse
  - Fishing Port
  - Fish Landing Centre
  - Road
  - High Tide Line
  - Low Tide Line
  - Seawall
  - Fishing Wards
  - Chennai Metro City Boundary
  - Municipal/Other Urban Areas
  - Village Boundary
  - Taluk Boundary
  - Breakwater or Jetty
  - Survey Plots
  - Fish Drying or Boat Parking Area
  - Fishing Harbour
  - Fisherman Settlement
- CRZ Lines & Boundary**
- Hazard Line
  - 100 m Line in CRZ III Area
  - 200 m CRZ Line - NDZ
  - CVCA Boundary
  - Sand Dune Beyond CRZ Boundary
  - CRZ Boundary  
(500m Line, 100m for Bay, 100 m or width of the creek whichever is less along the tidal influenced water bodies)
- CRZ CATEGORY**
- CRZ - I**
- CRZ - IA
  - 50 m Mangrove Buffer Zone - CRZ IA
  - CRZ - IB
- CRZ - II**
- CRZ - II
- CRZ - III**
- No Development Zone
  - 200 to 500 m from HTL
- CRZ - IV**
- CRZ - IVA
  - CRZ - IVB

SOURCE : CLIENT

- PROPOSED FLOOD ESCAPE CHANNEL
- 7km BUFFER FROM THE PROJECT SITE

**Note:**

- Coastal Regulation Zone Map of the site is prepared considering Approved CZMP as per CRZ Notification 2011 of MoEF & CC, Govt.
- Superimposition of the Project Site on Approved CZMP is subject to scale and generalisation error.
- The map comes with a report wherein description of CRZ zonation of project layout details are given. This map is to be referenced and used along with the report bearing the same reference no: AU/IRS/KSR/Q820925-10190/270-2025-26 DT. 14.11.2025.
- The DGPS Survey was carried out specific to the referred project site boundary only hence, validation of HTL and CRZ Boundary is limited to the clearance of the same. Institute of Remote Sensing do not carry responsibility for CRZ status of other plots or neighbourhood.



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REF NO. AU/IRS/KSR/Q820925-10190/270-2025-26 DT. 14.11.2025 (Nov. 2025)

FOR  
The Executive Engineer, WRD  
Araniyar Basin Division  
Chepauk, Chennai 600 005

PREPARED BY	
VERIFIED BY	
QUALITY CHECKED BY	
APPROVED BY	

Dr. R. VIDHYA, B.E(Hons), M.Tech, Ph.D. PGDEL  
Director  
Institute of Remote Sensing  
Anna University, Chennai - 600 025

Preparation of Local Level CRZ Map for the Proposed Construction of Straight Cut Flood Escape Channel from South Buckingham Canal near Okkiyam Maduvu to Sea in Chennai District, Tamil Nadu for Flood Relief to Fringe areas around Pallikaranai Swamp by Superimposing on Approved CZMP as per CRZ Notification 2011



**Legend**

**SOURCE: APPROVED CZMP (MAP NOS : TN 104, 105, 106 & 107) AS PER CRZ NOTIFICATION 2011**

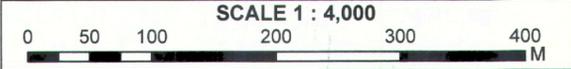
- LOW TIDE LINE (LTL)
- HIGH TIDE LINE (HTL)
- CRZ BOUNDARY (500m FOR SEA, 100m FOR BAY, 100m OR WIDTH OF THE CREEK WHICHEVER IS LESS ALONG THE TIDAL INFLUENCED WATER BODIES)
- ROAD
- SURVEY PLOTS
- VILLAGE BOUNDARY
- FISHERMAN SETTLEMENT
- FISH DRYING OR BOAT PARKING AREA
- CRZ - IA
- CRZ - IB
- CRZ - II
- CRZ - IVA
- CRZ - IVB
- ⊗ HTL REFERENCE POINT

**SOURCE: CLIENT**

- ⊗ POINTS ALONG THE PROPOSED FLOOD ESCAPE CHANNEL (GPS SURVEY POINT IDENTIFIED BY THE CLIENT)
- PROPOSED FLOOD ESCAPE CHANNEL

**Note:**

1. Coastal Regulation Zone Map of the site is prepared considering Approved CZMP as per CRZ Notification 2011 of MoEF & CC, GoI
2. Superimposition of the Project Site on Approved CZMP is subject to scale and generalisation error
3. The map comes with a report wherein description of CRZ zonation of project layout details are given. This map is to be referenced and used along with the report bearing the same reference no: AU/IRS/KSR/Q820925-10190/270-2025-26 DT. 14.11.2025
4. The DGPS Survey was carried out specific to the referred project site boundary only hence, validation of HTL and CRZ Boundary is limited to the clearance of the same. Institute of Remote Sensing do not carry responsibility for CRZ status of other plots or neighbourhood.



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**FOR**  
**The Executive Engineer, WRD  
 Araniyar Basin Division  
 Chepauk, Chennai 600 005**

PREPARED BY	
VERIFIED BY	
QUALITY CHECKED BY	
APPROVED BY	 <b>Dr. R. VIDHYA, B.Ethion, M.Tech., Ph.D., PGDEL          Director</b>

**Institute of Remote Sensing  
 Anna University, Chennai - 600 025.**

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### Proposal Details

Proposal No.:	IA/TN/CRZ/561046/2025
Single Window No.:	SW/268325/2025
CAF No.:	CAF/253439/2025
Project Name:	Construction of Straight-Cut Flood Escape Channel from South Buckingham Canal near Okkiyam Maduvu to Sea in Chennai district for flood relief to fringe areas around Pallikarandai Swamp.
State:	TAMIL NADU
Proposal For:	Fresh Proposal Form
Application For:	Fresh Proposal Form
Date of Submission:	10/12/2025
State File No.:	DOECC-1964-2025

### Proposal History/Timeline

[Preview](#)

#### Activity

**Start Date - End Date**

#### Under Examination with SCZMA

10/12/2025-N/A

Start Date

10/12/2025

End Date

N/A

#### Submitted

08/12/2025-10/12/2025

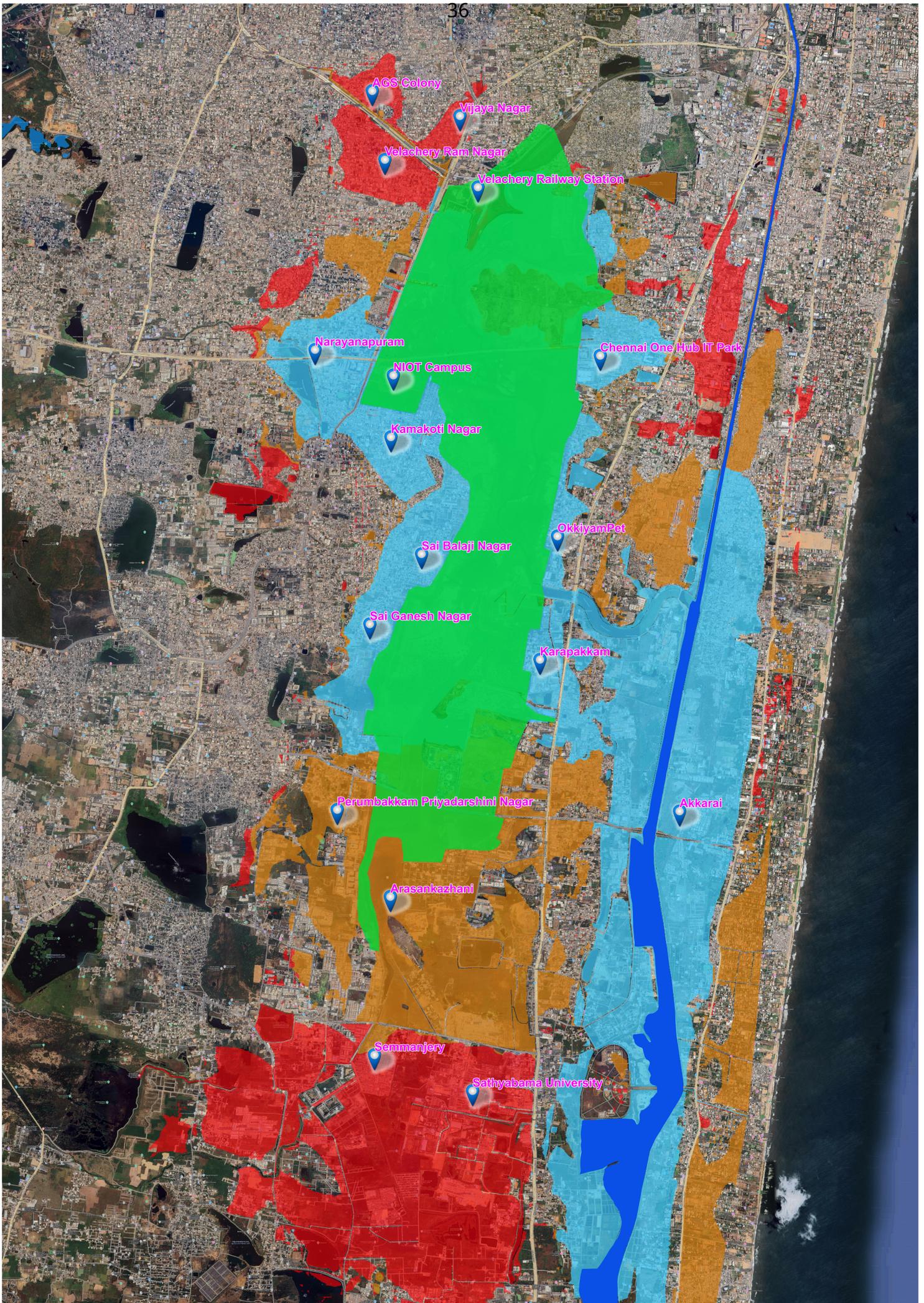
Start Date

08/12/2025

End Date

10/12/2025

Activate Windows



# Water Quality Analysis in South Buckingham Canal and Marine Water Quality around the Proposed Flood Escape Drain Outlet in Chennai District

## INTERIM REPORT

*Submitted to*



**Water Resources Department (WRD)  
Government of Tamil Nadu  
Chepauk, Chennai – 600 005**

**Submitted By**



**Institute for Ocean Management  
Anna University, Chennai- 600 025**

**December 2025**

## Water Sampling Locations of Study Area



### Results of Water Quality Analysis in South Buckingham Canal During October 2025

S. No	PARAMETERS	UNIT	Sampling Locations at South Buckingham Canal			Water Quality Standards for Different Classes (as per IS: 2296)				
			S1 (at Project site)	S2 (500m Downstream)	S3 (500m Upstream)	A	B	C	D	E
<b>A. Physical Parameters</b>										
1	Colour	Hazen	10.0	15.0	15.0	10	300	300	-	-
2	Odour	-	Agreeable	Agreeable	Agreeable	Unobj	-	-	-	-
3	Turbidity	NTU	4.8	5.1	4.1	-	-	-	-	-
4	Total Dissolved Solids (TDS)	mg/l	840	810	792	500	-	1500	-	2100
5	Total Suspended solids (TSS)	mg/l	16.0	18.0	14.0	-	-	-	-	-
6	Conductivity @ 25°C	µmhos/cm	1360	1322	1302	-	-	-	1000	2250
<b>B. Chemical Parameters</b>										
7	pH @ 25°C	-	7.24	7.30	7.41	8.5	8.5	8.5	8.5	8.5
8	Dissolved Oxygen	mg/l	6.5	6.5	6.5	6	5	4	4	-
9	BOD @27°C for 3 days	mg/l	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	2	3	3	-	-
10	Chemical Oxygen Demand	mg/l	10.0	8.0	8.0	-	-	-	-	-

Table Continues on next Page

**Note:** **Class A** – Drinking water without conventional treatment but after disinfection. **Class B** –Water for outdoor bathing. **Class C** – Drinking water with conventional treatment followed by disinfection. **Class D** – Water for fish culture and wild life propagation. **Class E** – Water for irrigation, industrial cooling and controlled waste disposal. (Unobj = Unobjectionable) BDL: Below Detectable Limit; DL: Detectable Limit.

S. No	PARAMETERS	UNIT	Sampling Locations at South Buckingham Canal			Water Quality Standards for Different Classes (as per IS: 2296)				
			S1 (at Project site)	S2 (500m Downstream)	S3 (500m Upstream)	A	B	C	D	E
			11	Oil & Grease	mg/l	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	-	-
12	Total Hardness as CaCO <sub>3</sub>	mg/l	255	242	234	300	-	-	-	-
13	Chloride as Cl	mg/l	219	212	202	250	-	600	-	600
14	Sulfate as SO <sub>4</sub>	mg/l	76.0	71.0	84.0	400	-	400	-	1000
15	Free Ammonia as N	mg/l	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	-	-	-	1.2	-
16	Fluorides as F	mg/l	4.95	0.30	0.28	1.5	1.5	1.5	-	-
17	Calcium as Ca	mg/l	63.2	61.2	60.0	80.10	-	-	-	-
18	Magnesium as Mg	mg/l	23.3	21.4	20.2	24.28	-	-	-	-
19	Iron as Fe	mg/l	0.41	0.48	0.45	0.3	-	50	-	-
20	Manganese as Mn	mg/l	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	0.5	-	-	-	-
21	Boron as B	mg/l	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	-	-	-	-	2
22	Lead as Pb	mg/l	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	0.1	-	0.1	-	-
23	Cadmium as Cd	mg/l	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	0.01	-	0.01	-	-
24	Mercury as Hg	mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	0.001	-	-	-	-
<b>C. Biological Parameters</b>										
25	Total Coliforms	MPN/100ml	40	34	27	50	500	5000	-	-
26	Fecal Coliforms	MPN/100ml	30	27	22	-	-	-	-	-
<p><b>Note: Class A</b> – Drinking water without conventional treatment but after disinfection. <b>Class B</b> –Water for outdoor bathing. <b>Class C</b> – Drinking water with conventional treatment followed by disinfection. <b>Class D</b> – Water for fish culture and wild life propagation. <b>Class E</b> – Water for irrigation, industrial cooling and controlled waste disposal. (Unobj = Unobjectionable) BDL: Below Detectable Limit; DL: Detectable Limit.</p>										

### Marine Water Quality Near the Proposed Flood Escape Drain in Uthandi Beach – October 2025

S. No	PARAMETERS	UNIT	Sampling Locations			Central Pollution Control Board (CPCB) Standards for Coastal water Marine Outfalls				
			S4 (at Outlet)	S5 (500m South)	S6 (500m North)	SW-I	SW-II	SW-III	SW-IV	SW-V
			<b>A. Physical Parameters</b>							
1	Colour	Hazen	10.0	10.0	10.0	No Noticeable or Offensive Colour	No Noticeable or Offensive Colour	No Noticeable or Offensive Colour	No Visible or Offensive Colour	-
2	Odour	--	Disagreeable	Disagreeable	Disagreeable	No Noticeable or Offensive Odour	No Noticeable or Offensive Odour	No Noticeable or Offensive Odour	No Visible or Offensive Odour	-
3	Turbidity	NTU	1.2	1.1	1.1	-	30	30	-	-
4	Total Dissolved Solids (TDS)	mg/l	38400	37600	37240	-	-	-	-	-
5	Total Suspended solids (TSS)	mg/l	2.0	2.0	2.0	-	-	-	-	-
6	Conductivity @ 25°C	µmhos/cm	60200	58600	58100	-	-	-	-	-

Table Continues on Next Page

**Note:** Class SW-I = Salt Pans, Shell Fishing, Mariculture and Ecologically Sensitive Zone, Class SW-II = Bathing, Contact Water Sports and commercial fishing, Class SW- III = Industrial Cooling, Recreation (Non- Contact) and Aesthetics, Class SW – IV = Harbour, Class SW- V = Navigation and controlled Waste Disposal, BDL: Below Detectable Limit

S. No	PARAMETERS	UNIT	Sampling Locations			Central Pollution Control Board (CPCB) Standards for Coastal water Marine Outfalls				
			S4 (at Outlet)	S5 (500m South)	S6 (500m North)	SW-I	SW-II	SW-III	SW-IV	SW-V
			<b>B. Chemical Parameters</b>							
7	pH @ 25°C	--	7.86	7.92	7.81	6.5-8.5	6.5-8.5	6.5-8.5	6.5-9.0	6.5-9.0
8	Dissolved Oxygen	mg/l	6.4	6.4	6.4	5.0	4.0	3.0	3.0	3.0
9	BOD @27°C for 3 days	mg/l	5.0	6.0	5.0	-	3	-	5	-
10	Chemical Oxygen Demand	mg/l	32.0	40.0	36.0	-	-	-	--	-
11	Oil and grease	mg/l	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	0.1	-	-	-	-
12	Total Hardness as CaCO <sub>3</sub>	mg/l	5800	5760	5720	-	-	-	-	-
13	Chloride as Cl	mg/l	23400	22900	22760	-	-	-	-	-
14	Sulfate as SO <sub>4</sub>	mg/l	2750	2650	2600	-	-	-	-	-
15	Free Ammonia as N	mg/l	0.16	0.15	0.14	-	-	-	-	-
16	Fluorides as F	mg/l	3.90	3.81	3.77	-	-	-	-	-
17	Calcium as Ca	mg/l	706	702	699	-	-	-	-	-
18	Magnesium as Mg	mg/l	968	961	953	-	-	-	-	-
19	Iron as Fe	mg/l	0.27	0.23	0.28	-	-	-	-	-
20	Manganese as Mn	mg/l	0.16	0.16	0.16	-	-	-	-	-

Table Continues on Next Page

**Note:** Class SW-I = Salt Pans, Shell Fishing, Mariculture and Ecologically Sensitive Zone, Class SW-II = Bathing, Contact Water Sports and commercial fishing, Class SW- III = Industrial Cooling, Recreation (Non- Contact) and Aesthetics, Class SW – IV = Harbour, Class SW- V = Navigation and controlled Waste Disposal, BDL: Below Detectable Limit

S. No	PARAMETERS	UNIT	Sampling Locations			Central Pollution Control Board (CPCB) Standards for Coastal water Marine Outfalls				
			S4 (at Outlet)	S5 (500m South)	S6 (500m North)	SW-I	SW-II	SW-III	SW-IV	SW-V
			21	Boron as B	mg/l	0.31	0.31	0.30	-	-
22	Lead as Pb	mg/l	0.39	0.37	0.35	0.01	-	-	-	-
23	Cadmium as Cd	mg/l	1.05	1.00	0.94	0.01	-	-	-	-
24	Mercury as Hg	mg/l	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.01)	0.01	-	-	-	-
<b>C. Biological Parameters</b>										
25	Total Coliforms	MPN/100ml	40	34	30	-	-	-	-	-
26	Fecal Coliforms	MPN/100ml	30	33	23	-	100	500	500	500
<p><b>Note:</b> Class SW-I = Salt Pans, Shell Fishing, Mariculture and Ecologically Sensitive Zone, Class SW-II = Bathing, Contact Water Sports and commercial fishing, Class SW- III = Industrial Cooling, Recreation (Non- Contact) and Aesthetics, Class SW – IV = Harbour, Class SW- V = Navigation and controlled Waste Disposal, BDL: Below Detectable Limit</p>										

### Results of Water Quality Analysis in Buckingham Canal During November 2025

S. No	PARAMETERS	UNIT	Sampling Locations at South Buckingham Canal			Water Quality Standards for Different Classes (as per IS: 2296)				
			S1 (at Project site)	S2 (500m Downstream)	S3 (500m Upstream)	A	B	C	D	E
<b>A. Physical Parameters</b>										
1	Colour	Hazen	10.0	10.0	10.0	10	300	300	-	-
2	Odour	-	Agreeable	Agreeable	Agreeable	Unobj	-	-	-	-
3	Turbidity	NTU	4.4	4.1	4.4	-	-	-	-	-
4	Total Dissolved Solids (TDS)	mg/l	1360	1342	1354	500	-	1500	-	2100
5	Total Suspended solids (TSS)	mg/l	12.0	12.0	14.0	-	-	-	-	-
6	Conductivity @ 25°C	µmhos/cm	2125	2068	2120	-	-	-	1000	2250
<b>B. Chemical Parameters</b>										
7	pH @ 25°C	-	6.78	7.05	7.24	8.5	8.5	8.5	8.5	8.5
8	Dissolved Oxygen	mg/l	6.6	6.6	6.6	6	5	4	4	-
9	BOD @27°C for 3 days	mg/l	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	2	3	3	-	-
10	Chemical Oxygen Demand	mg/l	8.0	8.0	8.0	-	-	-	-	-
11	Oil & Grease	mg/l	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	-	-	0.1	0.1	-

Table Continues on next Page

**Note:** Class A – Drinking water without conventional treatment but after disinfection. Class B –Water for outdoor bathing. Class C – Drinking water with conventional treatment followed by disinfection. Class D – Water for fish culture and wild life propagation. Class E – Water for irrigation, industrial cooling and controlled waste disposal. (Unobj = Unobjectionable) BDL: Below Detectable Limit; DL: Detectable Limit.

S. No	PARAMETERS	UNIT	Sampling Locations at South Buckingham Canal			Water Quality Standards for Different Classes (as per IS: 2296)				
			S1 (at Project site)	S2 (500m Downstream)	S3 (500m Upstream)	A	B	C	D	E
			12	Total Hardness as CaCO <sub>3</sub>	mg/l	376	350	374	300	-
13	Chloride as Cl	mg/l	292	280	274	250	-	600	-	600
14	Sulfate as SO <sub>4</sub>	mg/l	110	102	106	400	-	400	-	1000
15	Free Ammonia as N	mg/l	BDL(DL:1.0)	BDL(DL:1.0)	BDL(DL:1.0)	-	-	-	1.2	-
16	Fluorides as F	mg/l	0.38	0.36	0.39	1.5	1.5	1.5	-	-
17	Calcium as Ca	mg/l	88.0	86.0	90.0	80.10	-	-	-	-
18	Magnesium as Mg	mg/l	37.4	32.4	35.8	24.28	-	-	-	-
19	Iron as Fe	mg/l	0.52	0.49	0.50	0.3	-	50	-	-
20	Manganese as Mn	mg/l	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	0.5	-	-	-	-
21	Boron as B	mg/l	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	-	-	-	-	2
22	Lead as Pb	mg/l	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.1)	0.1	-	0.1	-	-
23	Cadmium as Cd	mg/l	BDL(DL:0.01)	BDL(DL:0.01)	BDL(DL:0.01)	0.01	-	0.01	-	-
24	Mercury as Hg	mg/l	BDL(DL:0.001)	BDL(DL:0.001)	BDL(DL:0.001)	0.001	-	-	-	-
<b>C. Biological Parameters</b>										
25	Total Coliforms	MPN/100ml	40	30	34	50	500	5000	-	-
26	Fecal Coliforms	MPN/100ml	30	23	27	-	-	-	-	-
<b>Note: Class A</b> – Drinking water without conventional treatment but after disinfection. <b>Class B</b> –Water for outdoor bathing. <b>Class C</b> – Drinking water with conventional treatment followed by disinfection. <b>Class D</b> – Water for fish culture and wild life propagation. <b>Class E</b> – Water for irrigation, industrial cooling and controlled waste disposal. (Unobj = Unobjectionable) BDL: Below Detectable Limit; DL: Detectable Limit.										

### Marine Water Quality Near the Proposed Flood Escape Drain in Uthandi Beach – November 2025

S. No	PARAMETERS	UNIT	Sampling Locations			Central Pollution Control Board (CPCB) Standards for Coastal water Marine Outfalls				
			S4 (at Outlet)	S5 (500m South)	S6 (500m North)	SW-I	SW-II	SW-III	SW-IV	SW-V
			<b>A. Physical Parameters</b>							
1	Colour	Hazen	10.0	10.0	10.0	No Noticeable or Offensive Colour	No Noticeable or Offensive Colour	No Noticeable or Offensive Colour	No Visible or Offensive Colour	-
2	Odour	--	Disagreeable	Disagreeable	Disagreeable	No Noticeable or Offensive Odour	No Noticeable or Offensive Odour	No Noticeable or Offensive Odour	No Visible or Offensive Odour	-
3	Turbidity	NTU	1.1	1.1	1.1	-	30	30	-	-
4	Total Dissolved Solids (TDS)	mg/l	33200	32840	32620	-	-	-	-	-
5	Total Suspended solids (TSS)	mg/l	2.0	2.0	2.0	-	-	-	-	-
6	Conductivity @ 25°C	µmhos/cm	52500	52100	51840	-	-	-	-	-

**Table Continues on Next Page**

**Note:** Class SW-I = Salt Pans, Shell Fishing, Mariculture and Ecologically Sensitive Zone, Class SW-II = Bathing, Contact Water Sports and commercial fishing, Class SW- III = Industrial Cooling, Recreation (Non- Contact) and Aesthetics, Class SW – IV = Harbour, Class SW- V = Navigation and controlled Waste Disposal, BDL: Below Detectable Limit

S. No	PARAMETERS	UNIT	Sampling Locations			Central Pollution Control Board (CPCB) Standards for Coastal water Marine Outfalls				
			S4 (at Outlet)	S5 (500m South)	S6 (500m North)	SW-I	SW-II	SW-III	SW-IV	SW-V
			<b>B. Chemical Parameters</b>							
7	pH @ 25°C	--	7.82	7.73	7.64	6.5-8.5	6.5-8.5	6.5-8.5	6.5-9.0	6.5-9.0
8	Dissolved Oxygen	mg/l	6.4	6.4	6.4	5.0	4.0	3.0	3.0	3.0
9	BOD @27°C for 3 days	mg/l	4.0	4.0	5.0	-	3	-	5	-
10	Chemical Oxygen Demand	mg/l	28.0	24.0	28.0	-	-	-	--	-
11	Oil and grease	mg/l	BDL(DL:2.0)	BDL(DL:2.0)	BDL(DL:2.0)	0.1	-	-	-	-
12	Total Hardness as CaCO <sub>3</sub>	mg/l	5200	5140	5220	-	-	-	-	-
13	Chloride as Cl	mg/l	20620	20420	20840	-	-	-	-	-
14	Sulfate as SO <sub>4</sub>	mg/l	2540	2400	2500	-	-	-	-	-
15	Free Ammonia as N	mg/l	0.12	0.12	0.13	-	-	-	-	-
16	Fluorides as F	mg/l	3.42	3.39	3.51	-	-	-	-	-
17	Calcium as Ca	mg/l	682	678	684	-	-	-	-	-
18	Magnesium as Mg	mg/l	839	827	842	-	-	-	-	-
19	Iron as Fe	mg/l	0.22	0.18	0.20	-	-	-	-	-
20	Manganese as Mn	mg/l	0.14	0.13	0.14	-	-	-	-	-

Table Continues on Next Page

**Note:** Class SW-I = Salt Pans, Shell Fishing, Mariculture and Ecologically Sensitive Zone, Class SW-II = Bathing, Contact Water Sports and commercial fishing, Class SW- III = Industrial Cooling, Recreation (Non- Contact) and Aesthetics, Class SW – IV = Harbour, Class SW- V = Navigation and controlled Waste Disposal, BDL: Below Detectable Limit

S. No	PARAMETERS	UNIT	Sampling Locations			Central Pollution Control Board (CPCB) Standards for Coastal water Marine Outfalls				
			S4 (at Outlet)	S5 (500m South)	S6 (500m North)	SW-I	SW-II	SW-III	SW-IV	SW-V
			21	Boron as B	mg/l	0.29	0.28	0.27	-	-
22	Lead as Pb	mg/l	0.35	0.34	0.33	0.01	-	-	-	-
23	Cadmium as Cd	mg/l	0.96	0.95	0.94	0.01	-	-	-	-
24	Mercury as Hg	mg/l	BDL(DL:0.1)	BDL(DL:0.1)	BDL(DL:0.01)	0.01	-	-	-	-
<b>C. Biological Parameters</b>										
25	Total Coliforms	MPN/100ml	50	34	40	-	-	-	-	-
26	Fecal Coliforms	MPN/100ml	30	33	23	-	100	500	500	500
<b>Note: Class SW-I = Salt Pans, Shell Fishing, Mariculture and Ecologically Sensitive Zone, Class SW-II = Bathing, Contact Water Sports and commercial fishing, Class SW- III = Industrial Cooling, Recreation (Non- Contact) and Aesthetics, Class SW – IV = Harbour, Class SW- V = Navigation and controlled Waste Disposal, BDL: Below Detectable Limit</b>										

### Conclusion

The Water Quality Analysis has been conducted both in the South Buckingham Canal and Sea Water during the Pre-Monsoon Season and Monsoon Season for the year 2025. The Sampling has been taken at the project offtake site in the Buckingham Canal near Indian Maritime University Bridge and covering 500m upstream and 500m downstream in the Buckingham Canal. Similarly, the Marine Water quality at the immediate confluence of proposed Flood Escape drain, 500m northern and 500m southern side in the Sea. The Buckingham Canal water was been tested in accordance with the standards of IS 2296 and Marine Water quality standards as per Central Pollution Control Board (CPCB) norms were analyzed for October and November months. The test results shows that the proposed diversion of flood water from the South Buckingham Canal may not affect the Marine Water Quality of various designated use. Though the Conductivity in the Buckingham Canal is marginally above the permissible limit, it will completely dispersed into the Sea without increasing the Conductivity of Marine water.

## Site Photos



**Location of Starting of Flood Escape Channel near IMU Bridge**

# Site Photos



**Proposed Alignment of Flood Escape Channel along ECR Road Shoulder**

# Site Photos



**Proposed Alignment of Flood Escape Channel at VGP 2<sup>nd</sup> Main Road**

# Site Photos



**Proposed Alignment of Flood Escape Channel along VGP 2<sup>nd</sup> Main Road**

## Site Photos



**Proposed Outlet location of Flood Escape Channel near Uthandi Beach**



**DGPS Survey by N.I.O.T Team**



**DGPS Survey by N.I.O.T Team**



**Director, Institute of Ocean Management Inspection**



**Institute of Remote Sensing CRZ Data Collection**



**Centre for Environmental Studies, Anna Univ. Site Inspection**