KERALA SOLID WASTE MANAGEMENT PROJECT (KSWMP)

LOCAL SELF GOVERNMENT DEPARTMENT, GOVERNMENT OF KERALA

Loan No./Credit No./Grant No.: IBRD92080;
Reference No IN-SUCM -326518-CS-QCBS

REQUEST FOR EXPRESSIONS OF INTEREST

(International Competitive Bidding)

FOR

TECHNICAL CONSULTANCY FOR FEASIBILITY STUDY OF REGIONAL SANITARY LANDFILLSAND TRANSFER STATIONS IN KERALA

NOVEMBER 2022

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REQUEST FOR EXPRESSIONS OF INTEREST

(TECHNICAL CONSULTANCY FOR FEASIBILITY STUDY OF REGIONAL SANITARY LANDFILLSAND TRANSFER STATIONS IN KERALA – FIRMS SELECTION)

INDIA

Kerala Solid Waste Management Project (KSWMP)

Loan No./Credit No./Grant No.: IBRD92080

Assignment Title: Technical Consultancy (TC) for Feasibility Study of Regional Sanitary Landfills (SLFs)and transfer stations in Kerala

Reference No IN-SUCM -326518-CS-QCBS

1. Background

The Government of Kerala through Government of India has obtained financing from the World Bank toward the cost of the Kerala Solid Waste Management Project (KSWMP) (the "Client") and intends to apply part of the proceeds for consulting services titled "Technical Consultancyfor Feasibility Study of Regional Sanitary Landfills (SLFs)and transfer stations in Kerala" for KSWMP to be selected on International Competitive Bidding (ICB) process.

Broadly, the scope of the consulting service ("the Services") is to conduct the feasibility study for determining the techno-economic viability of the proposed investment and develop the most sustainable and cost-effective arrangement and preliminary design for the regional SWM infrastructure (Regional landfill + Transfer Stations) taking into account the local context and capacity constraints, and based on that, outline and analyze procurement options for the subsequent steps, including design, construction and operation of the proposed regional SWM facilities. The specific scope of service includes the following three Tasks:

a. **Task 1 –** Data collection and investigations

b. **Task 2 –** Preliminary design, economic evaluation and conclusion

c. **Task 3** – Procurement analysis and options recommendations and assistance for selection of a Contractor

The Consultancy Engagement shall be broadly as per the indicative ToR appended to this REoI. The Consultancy contract shall be for a tentative period of 45 weeks from the date of signing of the agreement.

A cluster approach has been adopted for the planning, design and development of regional facilities. As per the cluster planning 93 ULBs are grouped into 5 Clusters. Sanitary landfills and transfer stations will be developed in each Cluster. SPMU envisages to hire the services of a consultant (firm) for conducting the feasibility study (FS) for the construction of regional SWM infrastructure, including regional landfill and transfer stations in each of the five clusters covering the State of Kerala.

State Project Management Unit (SPMU), Kerala Solid Waste Management Project (KSWMP)under Local Self Government Department, Government of Kerala now invites eligible consulting firms ("Consultants") to indicate their interest in providing the Services. This invitation is based on Open-International as market approach. Interested Consultants should provide information demonstrating that they have the required qualifications and relevant experience to perform the Services.

2. Instructions to Interested Consultants

The Expression of Interest is to be submitted in the manner prescribed below:

All information as detailed below is to be submitted in soft copies **separately** for each of the Package. The Formats are annexed to this document.

a) Applicant's Expression of Interest as per Format-1.
b) Organizational Contact Details of Single Entity and in case of JV applicant as per Format-2.
c) Financial strength of the applicant as per Format-3.
d) Experience of the applicant as per Format-4.
e) Additional information as per Format-5.
f) Power of Attorney in favour of Authorized Signatory with long and short signatures of Authorized person.

The Consultants are expected to examine all instructions, forms, terms and other details in the REOI document carefully. Failure to furnish complete information as mentioned in the REOI document or submission of an Expression of Interest not substantially responsive to the REOI documents in every respect will be at the Consultant's risk and may result in rejection of the same.

A consultant shall submit only one Expression of Interest (EOI), either individually or as a joint venture partner. If a consultant, including a joint venture partner, submits or participates in more than one EOI, all such EOIs shall be disqualified. This does not, however, preclude a consulting firm to participate as a sub- consultant.

The Expression of Interest documentation shall support to demonstrate that the Consultant meets theTechnical and Financial eligibility criteria.

Client intends to invite shortlisted applicants to participate in one or more RFP processes.First of these RFPs would be issued for a requirement of two clusters. However, Client at its sole discretion, without incurring any liability, reserves the right to conduct fresh Shortlisting exercise after first RFP.

3. Shortlisting Criteria

Each EOI would be evaluated against the following Short-listing Criteria.

a) have been in business during the last eight(08) years (i.e. 2013-22);
   - Single Entity Applicant: Must meet requirements.
   - JV Applicant: Must be met by the Lead Member

b) During any three of the the previous five financial years (i.e. FY2017-18, FY 2018-19, FY 2019-20, FY 2020-21 and FY 2021-22),applicanthas an average annual income of (i) INR 250 million from all sources (ii)INR 25 million from Technical Consultancy / Advisory services for Solid Waste Management infrastructure:

- Single Entity Applicant: Must meet the requirement
- JV Applicant: Must be jointly met by the JV. Lead Member must meet at least 50% of the requirement.

c) Applicant has satisfactorily completed two (02) assignments after April 01, 2013 with following scope pertaining to establishing a NEW and regional SLF facility together with accompanying transfer stations, at a scale no smaller than 25 acres or landfill capacity of 100 TPD :

i. Preparation of conceptual and preliminary design of above-described projects. If detail design and DPR preparation was also included, this shall be clearly outlined.

ii. Procurement support which includes contracting (Build only, Design-Build, EPC, Deign Build Operate etc.) option analysis, recommendation, contract structuring and handholding procurement support service

(i)and (ii) both can be present in two separate contracts. In such situation, such two contracts shall count as one assignment for the purpose of this criteria.

- Single Entity Applicant: Must meet requirement
- JV Applicant: Must be met jointly by all the JV members.

d) have technical and managerial capability to undertake the assignment. Criteria shall assess the expertise of the applicant. Expertise of affiliate firm(s) shall not be considered unless when affiliate is part of the proposed JV. Key Experts will not be evaluated at the short listing stage.

- Single Entity Applicant: Must meet requirement
- JV Applicant: Must be met jointly by all the JV members.

e) In case multiple applicants satisfy above listed criteria (a-d), Client will use criterion (c) as relative assessment criterion to finalize the shortlist i.e. assigning higher rank to the applicant who has delivered relatively more number of acceptable assignments.

f) Any Firm, which is already engaged by the Client for following consulting services, will be ineligible to get shortlisted in this REoIor receive an award under follow-on RFP process (es) on the grounds of Conflicting assignments

a. Firm providing Project management Consulting (PMC)
b. Firm/JV to be selected for preparation of Environment and SocialImpact assessment

Firms/ Individuals debarred by the World Bank shall be ineligible to participate during the period of debarment.

g) Consultants may associate with other firms to enhance their qualifications, but should indicate clearly whether the association is in the form of a joint ventureand/or a sub-consultancy. In the case of a joint venture, all the partners in the joint venture shall be jointly and severally liable for the entire contract, if selected. The nature of association i.e. whether JV or Sub-Consultant, must be clearly mentioned in the Expression of Interest.

h) The lists of documents to be submitted along with EOI (Expression of Interest) shall not be more than a total of 60 pages:

Sl. No.	Shortlisting Criteria	Supporting-Compliance Document
a	Have been in the business during last eight (08) years (i.e. 2013-22)	a) Format 2: Name, address, e-mail, telephone along with a note on the Ownership and organizational structure & core business area of the consulting firm; b) Copy of Certificate of Incorporation and Partnership Deed, if any c) Copy of any other Registration Certificate which proves the legal identity of the Company. d) In case of JV Applicant, in addition to the above, a letter of intent to form a joint venture or, if the JV is already formed,a copy of the existing JV agreement signed by every participating member which details the likely legal structure of and the confirmation of joint and severable liability of the members of the said joint venture.
b	Have an average annualincomeof (i) INR 250 million from all sources(ii) INR 25 million from Technical Consultancy / Advisory services for Solid Waste Management infrastructureduringany three of the the previous five financial years (i.e. FY2017-18, FY 2018-19, FY 2019-20, FY 2020-21 and FY 2021-22),	Format 03& 03A: Financial Details. Audited Financial Statement along with the Balance Sheet and Profit & Loss Statement duly certified by the statutory auditors/Chartered Accountant the year wise annual income duringeach of the previous five financial years 2017-18, 2018-19, 2019-20, 2020-21 and 2021-22.
c	Have satisfactorily completed at least 2 (two) projects of providing the Consultant Services with following scope pertaining to establishing a NEW and regional SLF facility together with accompanying transfer stations, at a scale no smaller than 25 acres or landfill capacity of 100 TPD in the last 08 years (i.e. April 01, 2013 to March 31, 2022);	
	i. Preparation of conceptual and preliminary design of above-described projects. If detail design and DPR preparation was also included, this shall be clearly outlined. ii. Procurement support which includes	a) Document (s) relating to details of assignments (requested above) shall be supported by completion certificate or work order along with final payment confirmation by the Client. The supporting documents shall

	contracting (Build only, Design-Build, EPC, Deign Build Operate etc.) option analysis, recommendation, contract structuring and handholding procurement support service (i)and (ii) both can be present in two separate contracts. In such situation, such two contracts shall count as one assignment for the purpose of this criteria.	clearly state the scope of work and contract value undertaken by the applicant. b) Details of Maximum 04 projects satisfying the eligibility Criteria shall only be submitted. The same shall be submitted in the Format 4 given as Annexure along with supporting documents for each package separately. c) In case more than eight assignments are demonstrated, only first eight assignments in the order of the Serial number would be evaluated.
d	Have technical and managerial capability to undertake the assignment.	Attach an Organization Chart showing the structure of the Company with names of the Key Personnel and technical staff. A short write-up on technical and managerial capability of the firm including the proposed structure and composition of team for this assignment, Managerial Strength with achievements if any to site as an example. Information about affiliate firms should not be provided unless they are part of the proposed JV.

4. Evaluation Criteria and Method of Evaluation for Shortlisting:

a) Interested Consultants must ensure that their EOI response is submitted as per the formats attached with this document. Special comments on the TOR may also be submitted along with the response. Failure to submit the EOI in the prescribed format and/or absence of any of the above criterion supported with formats and documents may result in rejection of the EOI.

b) Screening of EOIs shall be carried out as per eligibility conditions mentioned in this document and based on verification of documents submitted.

c) EOI will be evaluated using short listing criteria

d) The Shortlisted applicants shall be required, at a later stage, to submit a separate Proposal comprising Technical and Financial Proposals. A Consultant will be selected in accordance with the Quality-cum-Cost Based Selection (QCBS) method, set out in the World Bank Procurement Regulations.

5. Conditions under which EOI is issued

a) The attention of interested Consultants is drawn to Section III of the World Bank's "Procurement Regulations for IPF Borrowers" November 2020 ("Procurement Regulations"), setting forth the World Bank's policy on conflict of interest, eligibility and disqualification.

b) The EOI is not an offer and is issued with no commitment. KSWMP reserves the right to withdraw REOI and/or vary any part thereof at any stage before EOI submission deadline.

6. Deadline for submission of EOI

a) REOI along with TOR is available at www.kswmp.org and https://etenders.kerala.gov.in. Corrigendum, if any, shall also be hosted at www.kswmp.org and https://etenders.kerala.gov.in.

In exceptional circumstances and at its discretion, KSWMP may extend the deadline for submission of proposals by issuing an amendment to be made available on KSWMP and e tender website, in which case all rights and obligations of KSWMP and the applicants previously subject to the original deadline will thereafter be subject to the deadline as extended.

Interested Consultants must submit their EOIs (soft copy only), in its complete form in all respects as specified in the EOI, must be submitted in English language on or before **1700 hours, on 17th December 2022.** Online applications can be submitted from**26th November 2022, 1700** hours onwards. The Client shall use the following electronic-procurement system to manage this REOI process:

https://etenders.kerala.gov.in.

No other means/modes of application will be accepted.

b) A pre submission conference will be held via online mode at 1600 hrsIST on Friday, 02nd December 2022. All interested Applicants shall communicate their intention to attend the pre submission conference via email to tenderkswmp@gmail.com along with the name , email and contact number of the designated person/(s) to attend the same on or before 1700 hrs IST , 01st December 2022. The meeting link shall be shared to the respective email ids of the designated person by each Applicant. Participation shall be limited to two participants per Organisation/Applicant.

c) Further information can be obtained at the address below during office hours 1030 to 1700 hours.

Kerala Solid Waste Management Project, Local Self Government Department, Government of Kerala

Dr. Adeela Abdulla IAS
Project Director
Address: 4th Floor, Trans Towers, Vazhuthacaud,
Thiruvananthapuram -695014, Kerala, India
Telephone: 0471-2333011
E-Mail: tenderkswmp@gmail.com
Website: www.kswmp.org

ANNEXURE

FORMAT 1

Applicant's Expression of Interest Submission Form

(The Covering Letter is to be submitted under the signature of Authorized Representative / Signatory of the applicant agency/Lead Consultant, in case of JV Applicant on official Letterhead and official seal (Letter of authorization is also to be enclosed)

To

Project Director

Kerala Solid Waste Management Project (KSWMP)

4th Floor, Trans Tower, Vazhuthacaud

Thiruvananthapuram-695014

Kerala, India

Sub: Request for Expression of Interest issued by KSWMP for Technical Consultancy (TC) Service for the Feasibility Study for Regional SLF in Kerala, reference No **IN-SUCM -326518-CS-QCBS**

Dear Sir,

We, the undersigned, would like to express interest in response to Request for Expression of Interest (REOI) issued by KSWMP for Technical Consultancy (TC) Service for the Feasibility Study for Regional SLF in Kerala, in accordance with the REOI published on _____ dated_____.

{If the Consultant is a joint venture, insert the following: We are submitting our EOI as a joint venture with: {Insert a list with full name and the legal address of each member, and indicate the lead member}.We have attached a copy {insert: "of our letter of intent to form a joint venture" or, if a JV is already formed, "of the JV agreement"} signed by every participating member, which details the likely legal structure of and the confirmation of joint and several liability of the members of the said joint venture.

{OR

If the Consultant's EOI includes Sub-consultants, insert the following: We are submitting our EOI with the following firms as Sub-consultants: {Insert a list with full name and address of each Sub-consultant.}.

We are pleased to express our interest for Technical Consultancy (TC) Service for the Feasibility Study for Regional SLF in Kerala,and

Whereby declare that:

(a) We have read the draft Terms of Reference and REOI document in detail and have understood the terms and conditions stipulated in the REOI Document issued by KSWMP. We agree and undertake to abide by all these terms and conditions along with subsequent communication from KSWMP. Our EOI is consistent with all the requirements of submission as stated in the REOI or in any of the subsequent communications from KSWMP.

(b) All the information and statements made in this EOI are true and we understand and accept that any misinterpretation or misrepresentation contained in this EOI may lead to our rejection by the Client and/or may be sanctioned by the Bank.

(c) The information submitted in our EOI is complete, is strictly as per the requirements as stipulated in the REOI, and is correct to the best of our knowledge and understanding. We would be solely responsible for any errors/omissions/false information

(d) As instructed, we attach the following documents in the prescribed format and are properly presented in the EOI document.

	List of Documents	**Page No**
	Applicants Expression of Interest (Format 1)	
	Organizations Contact Details (Format 2)	
	Financial Strength of the Company (Format 3)	
	Experience of the Organization (Format 4)	
	Additional Information (Format 5)	
	Power of Attorney in favor of Authorized Signatory with long & Short Signatures of Authorized Person	

(e) We understand that the Client is not bound to accept any EOIs that the Client receives.

We hereby confirm that we are interested in participating for the selection process of hiring Technical Consultancy (TC) Service for the Feasibility Study for Regional SLF in Kerala, for KSWMP via Reference No **……**All the information provided herewith is genuine and accurate.

We remain,

Yours Sincerely

For and on behalf of:

Signature:

Name:

Designation:

(Authorized Representative with Signature & Seal)

Date:

Place:

FORMAT 2

S. No	Organizational Contact Details	
1.	Name of Organization	
2.	Main areas of business	
3.	Type of Organization Firm/ Company/ partnership firm registered under the Indian Companies Act,1956/ the partnership Act, 1932	
4.	Whether the firm is (i) owned / controlled by a State/ Central Government or (ii) a Not-for-Profit Organisation Govt. / State Govt./PSU/ Govt. Bodies / Autonomous? If yes, details thereof.	
5.	Address of Registered Office with telephone no. & fax	
6.	Address of offices in State of Kerala/ any other State/UT's, if any	
7.	Name , designation & organization of the Authorized Signatory (enclose letter of authorization)	

For and on behalf of:

Signature:
Name:
Designation:
(Authorized Representative with Signature & Seal)

Date:

Place:

Please provide copy of the below mentioned:

1. Copy of Registration/Incorporation Certificate/Deed
1. Copy of any other Registration Certificate which proves the legal identity of the agency
2. In Case of JV applicant, the above format needs to be furnished by each of the JV members.
3. Letter of Intent to form Joint Venture.

FORMAT 03

Financial Details

- *Declaration to be submitted under the signature of Chartered Accountant on Letterhead with his/her dated Sign and Seal.*
- *Single Entity Applicant: Must meet requirement*
  JV Applicant: Must be met by all JV members.

To Whomsoever It May Concern

On the basis of audited financial statements, we hereby certify that (Name of Agency) having registered office at (Office address) has an average annual income of INR ……..(from all sources, in any three of the five previous Financial Years (2022-21, 2020-21, 2019-20, 2018-19, 2017-2018). The details of year wise annual turnover are mentioned below:

Sl. No.	Financial Year	Annual Income
1	2017-18	
2	2018-19	
3	2019-20	
4	2020-21	
5	2021-22	

Note: Audited Financial Statement along with the Balance Sheet and Profit & Loss Statement duly audited/certified by the statutory auditors/Chartered Accountant stating the year wise annual turnover during each of the five financial years 2021-22, 2020-21, 2019-20, 2018-19 and 2017-18. The above shall be submitted by Single Entity/ each of the JV members in case of JV Applicant.

Chartered Accountant:

(Authorized Representative with Signature & Seal)

Name
Registration No
Contact No

Seal

Date:

Place:

FORMAT 03A

Financial Details

- *Declaration to be submitted under the signature of Chartered Accountant on Letterhead with his/her dated Sign and Seal.*
- *Single Entity Applicant: Must meet requirement*
  JV Applicant: Must be met by all JV members.

To Whomsoever It May Concern

On the basis of audited financial statements, we hereby certify that (Name of Agency) having registered office at (Office address) has an average annual income of Rs. ……..from Technical Consultancy/ Advisory services in SWM Infrastructure sector, in any three of the fivepreviousFinancial Years (2022-21, 2020-21, 2019-20, 2018-19, 2017-2018).). The details of year wise annual turnover are mentioned below:

Sl. No.	Financial Year	Annual Income from Technical Consultancy/ Advisory services in SWM Infrastructure sector
1	2017-18	
2	2018-19	
3	2019-20	
4	2020-21	
5	2021-22	

Note: The above shall be submitted by Single Entity/ each of the JV members in case of JV Applicant.

Chartered Accountant:

(Authorized Representative with Signature & Seal)

Name
Registration No Contact No.

Seal

Date:

Place:

FORMAT-04

Experience of Organization

FORMAT FOR SUBMISSION OF DETAILS OF ASSIGNMENTS IN RESPONSE TO REOI FOR HIRING OF TECHNICAL CONSULTANT (TC) FOR FEASIBILITY STUDY FOR REGIONAL SLF IN KERALA FOR KERALA SOLID WASTE MANAGEMENT PROJECT (KSWMP), KERALA

Name of the Firm or Lead Firm :

CRITERION 3c:

have proven experience of successfully completing 02 eligible Assignments as required herein in the last eight (08) years (i.e. April 01, 2013 to March 31, 2022)

***(*Key words:** *Technical Consultancy/ Advisory or Engineering Services for Project preparation and implementation of Sanitary Landfills)*

	Name of Assignment	**Name of Client & Country of Assignment**	**Duration** (Start – End date/year)&Status of Project	**Contract Value (in Rs.)**	**Role on Assignment** (Lead Member/ JV partner/ Sub-consultant)	**Keywords covered** (eg: Technical Consultancy/ Advisory or Engineering Services)	**Details of Supporting Document** (Mention reference to the document)	**Remarks, if any**

NOTE:

1. Details of maximum five (05) completed & Operational Projects shall only be submitted. Submission of projects exceeding the specific requirement will not be evaluated under any criteria.
2. In case of submission of more than requisite number of projects, serial number order will be followed for evaluation under each criterion.
3. Document (s) relating to details of assignments (requested above) shall be supported by Completion Certificate or Work Order along with Payment Confirmation certified by the client.
4. The supporting documents shall clearly state the scope of work undertaken by the bidding agency.
5. Ongoing projects shall not be submitted and are subject to rejection.

For and on behalf of:

Signature:

Name:

Designation:

(Authorized Representative with Signature & Seal)

Date:

Place:

FORMAT 5

Additional Information

Additional Information, if any, to support the eligibility (not more than two pages)

For and on behalf of:

Signature:

Name:

Designation:

(Authorized Representative with Signature & Seal)

Date:

Place:

Appendix I – Indicative Terms of Reference (ToR)

This ToR is being shared to enable the Applicant to make an informed submission of EoI. It is not final and may undergo revisions prior to issue of the follow-up RfP/RfPs.

Kerala Solid Waste Management Project

Terms of Reference for the

Consultancy Services for conducting the feasibility study for the construction of new landfills and transfer stations for two regional clusters

November 2022

Abbreviations and Acronyms

ASTM	American Society for Testing and Materials	PDO	Project Development Objective
CRZ	Coastal Regulation Zone	PAD	Project Appraisal Document
CPHEEO	Central Public Health & Environmental Engineering	PIM	Project Implementation Manual
CPCB	Central Pollution Control Board	RAP	Resettlement Action Plan
EIA	Environmental Impact Assessment	REOI	Request for Expression of Interest
EMF	Environmental Management Framework	SLF	Sanitary Landfill Facility
ESIA	Environmental and Social Impact Assessment	SPMU	State Project Management Unit(Client)
ESMP	Environmental and Social Management Plan	SEIAA	State or Union territory Level Environment Impact Assessment
FS	Feasibility Study	SIA	Social Impact Assessment
KINFRA	Kerala Industrial Infrastructure Development Corporation	SWM	Solid Waste Management
KSEBL	Kerala StateElectricity Board Limited	TDF-SMF	Tribal Development Framework-Social Management Framework
KSWMP	Kerala Solid Waste Management Project	TPD	Tons Per Day
MoEF& CC	The Ministry of Environment, Forest and Climate Change	TSC	Technical Support Consultant
NA	Not Applicable	ToR	Terms of Reference
NOC	No Objection Certificate	ULB	Urban Local Body`
NGO	Non-governmental organization	WSA	Waste Shed Areas
NGT	National Green Tribunal	WBG	World Bank Group
PCK	Plantation Corporation of Kerala		

1 BACKGROUND TO THE STUDY

Kerala has been urbanizing more rapidly than the national average. According to the last census, from 2001 to 2011 the percentage of urban population nearly doubled, with an Annual Growth Rate of urban population of 6.5 percent and a population density - 859 persons/sq. km, thrice the national average - 382 persons/sq.km. About 48 percent of the state's population lives in urban areas (covered under 93 ULBs, and notified urban agglomerations), with 52 percent of population concentrated in mid-small sized ULBs between 20,000-100,000 people, and the remaining 48 percent in bigger ULBs of over 100,000 people.

Government of Kerala has enabled policies and established agencies to support SWM activities across the state. Still SWM services in the state need improvement particularly in various infrastructure and service delivery systems across the value chain. This includes engineered landfills for secured landfilling of inert waste/rejects.

Kerala State Solid Waste Management Project (KSWMP), under LSGD, is implementing the Solid Waste Management Project in 93 ULBs (87 municipalities and 6 corporations) vide G.O (Rt) No. 1420/2020/LSGD dated 29-07-2020.The project is designed for a total cost of USD 300 million with the support of International Bank for Reconstruction and Development(IBRD) and Asian Infrastructure Investment Bank (AIIB), each providing financial of USD 105 million and State Government contributing USD 90 million.

The Project Development Objective is to strengthen the institutional and service delivery systems for solid waste management in Kerala. The project envisages comprehensive upgradation and development of solid waste management activities in various levels under three components:

Component 1- Institutional Development, Capacity Building and Project Management
Component 2- Grant support to ULBs for SWM.
Component 3 - Development of regional SWM facilities.

Under Component 3, KSWMP provides for the development of regional facilities including:

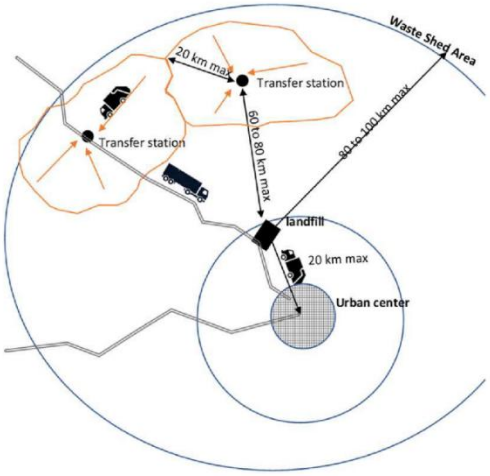
a. transfer stations (TS) and regional sanitary landfills (SLF)for municipal solid waste disposal;
b. regional C&D waste management facilities;
c. regional processing and recycling facilities; and
d. closure/remediation of existing dumpsites

A cluster approach was adopted for the planning of regional facilities over the next 20 to 25 years, seekingthe most technically and financially sustainable system. Regional planning led to subdivide the state into 5 clusters each centered around one landfill, using a GIS, based on the following parameters:

- Quantity of municipal solid waste generated
- Quantity of rejects to be disposed
- Land area requirement
- Distance of transportation and road network

For each of the planned regional sanitary landfills an inter-municipal agreement will be implemented for coordination and cost sharing amongst the participating ULBs.

In order to facilitate scheduled collection and transportation of the rejects to each landfill, several transfer stations are required in each cluster. The same GIS-based approach was used to identify the locations and number of transfer stations.



Regional planning including clusters and sub-clusters was conducted in 2022, and led to identifying candidate land parcels for developing SLF facilities and associated TS in two out of five clusters.

Abstract of the regional plan can be found in Appendix II.

For this particular assignement, SPMU envisages to hire the services of a consultant (firm) for conducting the feasibility study(FS) for the development of regional SWM infrastructure (SLF and TS), for the twoclusters(Cluster 1 and 4) where candidate sites have been identified for 1 SLF + 4 TS and 1 SLF+8 TS respectively.

This document gives a detailed scope ofthe work to be considered by the Consultant for conducting the FS.

2 OBJECTIVES

2.1 Overall objective

The objective of this assignment shall include but not limited to conduct the feasibility study for determining the techno-economic viability of the proposed investment anddevelop the most sustainable and cost-effective arrangement and preliminary design for the regional SWM infrastructure (Regional landfill + Transfer Stations), in clusters 1 and 4, taking into account the local context and capacity constraints, and based on that, outline and analyze procurement options for the subsequent steps, including design, construction and operation of the proposed regional SWM facilities.

2.2 Specific objectives

From a focused perspective, the specific consultancy assignment objectives, which will be translatedintothreemain tasks to be undertaken by the Consultant shall include but not limited to :

Task 1Data collection and investigations[1]

- Review of available information and collect specific site data, such as maps, reports, geologicalor hydrogeological data;
- Review, validate and update current and future waste generation quantities estimated by SPMU,andthecorresoondingtransfer and disposal infrastructure, based on recent studies and investigations carried out by SPMU;
- Study institutional feasibility including capacity building needs;

[1] Site presentation will be included in the final RfP document

- Study financial and economic feasibility for setting up a new sanitary landfill at the proposed site;
- Recommend design conditions and report the engineering analysis, complete with identification of design issues and needs; in terms of technical, time, cost, quality and sustainability; and
- Evaluate suitability of identified sites for landfill cell and transfer stations, and recommend preferred site and confirmoverallfeasibility.

Task 2Preliminary design, economic evaluation and conclusion

- Regional Sanitary LandFills (SLFs): Prepare preliminary designof projected disposal cell for an operational capacity of at least 20-25 years within an engineered structure and adoption of, modern and effective method of disposal in terms of environment, cost, applicability and sustainability;
- Transfer Stations: Prepare preliminary design of the transfer stations with a capacity of about 100 – 200 metric tons per day each and adoption of safe and cost-effective methods of municipal waste transfer;
- For all facilities: select best international practices and technologies to prevent environmental impacts associated with the new facility and conduct stakeholder consultations to validate these technical options are appropriate and feasible in the State context; and
- Prepare CapEx and OpEx cost estimates for each facility at **+/-10% accuracy** based on recent projects and including transportation costs between the transfer station and the landfill. The Block Cost Estimates shall take in to account the prevailing Government of India /Government of Kerala guidelines to enable the procurement of Contractor
- Provide Social and Environmental Consultants with baseline data, design and operational information for preparation of the ESIA/ESMP and RAP/Abbreviated RAP.
- Provide recommendations on the preferred delivery model (e.g. DB/DBO or others).

Task 3 Procurement analysis and options recommendations and assistance for selection of a Contractor

- Preparation of the Procurement Documents for selection of the Contractorbased on the selected delivery model
- Preparation of response to queries from bidders
- Assistance to evaluation of bids
- Assistance to Client during negotiations until the signing of Contract Agreement

3 SCOPE OF WORK

The Consultant should note that the proposed tasks below shall not be considered exhaustive, and should include all activities deemed necessary to produce a high quality output[2].

[2]Further details to be shared as part of the final RFP package.

3.1 Notice to consultants

Environmental and social diligence will be conducted in parallel to this study by a separate E&S consultantto ensure compliance with E&S standards applicable to the project and propose adequate measures to mitigate impacts. The Consultant shall maintain close cooperation with the E&S team throughout the assignment.More specifically, the Consultant is expected to :

- Share any primary and secondary data and information with the E&S consultant as technical deliverables will inform the E&S Consultant for establishing the baseline and assessing impacts associated with the construction and operation of the future facilities. All land related information collected by the Consultant shall be shared with the E&S consultants by the Client for their ESIA preparation, and
- Incorporate any recommendation from E&S consultant in order to minimize project impacts.More specifically, the E&S consultant will be incharge of conductin stakeholder consultation. In order to ensure a coherent approach, the Consultant is expected to attend consultation meetings with the main stakeholders, when possible, to gather any requests and comments from stakeholders that could affect the feasibility and/or the design of the proposed system.

3.2 TASK 1 :Data collection and investigations

3.2.1 Applicable legislations, guidelines, policies

In this task, the Consultant shall take stock of relevant rules, regulations, guidelines,policies and strategies at national and state level regadingsoild waste management facilities suchas sanitary landfills and transfer stations. However, it should be noted that the Government of India Solid Waste Management Rules 2016 shall be considered asthe legal document for SWM and the Manual on Municipal Solid Waste Management,2016 shall be considered as the technical guidance manual on design and operation of SWM facilities and regional sanitary landfill.

3.2.2 Review the SWM documents and Plans

In this task, the Consultant shall review and study all existing data, reports, plans and maps with the purpose of fully familiarizing itself with all pre-identified sites and identifying information gaps, arranging for additional data requirements collection including field investigations that will be required to commence conceptual design services.The Consultant shall review and validate the baseline sector information included in the various reports.

Following completion of this task, the Consultant is expected to confirm requirements for the proposed operation, select the preferred sites, assert feasibility and make further recommendations for the development of the new landfill.

This task will consist in identifying and reviewing the different documents:

- Review cluster profile, waste generation and projections provided in the SWM plans at ULB level, when available,andat cluster level
- Review Waste Shed Areas definition for each transfer station and for the regional landfill and based on transportation, natural conditions, safety considerations, etc.
- Review capacity requirements andconclude on asset useful life (between 20 to 25 years as per SWM rules 2016)
- Review land requirements for landfill

- Give opinion on the pre-identified locations for each facility based on agreed screening checklist including exclusion criteria as per standards applicable to the Project (Standard screening checklist provided in Appendix III)
- Review, assess, and verify the alternative solutions and facilities proposed for the project; and propose the most suitable option;

3.2.3 Baseline data collection and record documentation concerning pre-identified sites

Existing documentation regarding the development of landfill capacity including studies, reporting, maps, plans and records are to be considered.. Note that the Consultant has to collect design data from all sources and not only depend on reviewing the given baseline data.

During this task, the Consultant shall carry out all required field investigations and verifications with the purpose of verifying the collected data, information, maps, plans, waste volumes, etc. and for collecting and additionally required information. The consultant is responsible for securing the relevant approvals and consent from the relevant authorities prior to conducting site investigations, with the facilitation from the SPMU.

The Consultant shall review and validate the baseline sector information included in the various reports. The consultant should collect site-specific and project information outlined below:

- Walkover survey including pictures;
- Aerial Photographs/ Satellite Imagery;
- Maps for project area relevant locationsincluding statutory buffers from municipal records;
- Land Use Plans;
- Official land title;
- National regulation regarding landfill sites;
- Locally available construction materials; and
- Site specific physical information such as:
    - Hydrogeological report
    - Ground water levels
    - Topographic survey
    - Boreholes and wells within a 500m radius
    - Existing underground utilities;
    - Flood Plain Maps
    - Rainfall Data
    - Wind Map
    - Seismic Data
    - Road Maps
    - Etc.

3.2.4 Site investigations

Field investigations and laboratory tests of subsurface soil exploration are critical to confirming technical feasibility and to the definition of the proposed program of works, and shall be carried out to confirm (i) the quantity of soil material available within the site for cover purposes, permeability of the base of the new landfill cell and of the material to be used for final cover, bearing capacity of the base of the landfill, stability of any slopes to be cut, groundwater regime, and baseline quality of

ground and surface water, and (ii) the viability and cost estimates of the project, of the different facilities in accordance with approved national and international codes of practice.

Site investigations are required at each of the pre-identified sites i.e. new landfill and transfer stations and optional at identified borrow sites.

3.2.4.1 Notice to Consultants

The site investigationpackage(surveying, drilling, sampling and testing) is summarizedin the following section.Most of these investigations may significantly vary depending on site conditions. Considering this variability, activities will be paid using the Schedule of Priceson ad measurement basis.

3.2.4.2 Site investigation plan

Prior to commencing investigations, the Consultant shall prepare a comprehensive plan describing surveys, investigations, including sampling and testing, and obtain proper authorizations to access locations to be surveyed.

- Topographic survey

In this task, the Consultant shall carry out the required topographic surveys for the sites to enable the preparation of general site layout, alignment, roads profiles, extent of embankment and cut slopes profiles (with minimum horizontal accuracy of 50cm and vertical accuracy of 50cm), cross sections, general ground layouts and facilitate cut and fill calculations and other downstream work. The resulting document shall be of a scale (i.e. 1:1,000 to 1:2,000) and size accurately reflecting the results of the survey. The surveyor shall locate and show on the topographic survey map following information:

Contours lines indicating the shape and elevation of the land over the entire parcel, the location of permanent structures including retaining walls, bridges, and culverts, the location of street or road paving, entrance drive openings and sidewalks, elevations on the top of curbs, gutters and sidewalks, cadaster or official plot parcel delineation, North arrow and scale of drawing, legend depicting the symbols and abbreviations used on the drawing, spot elevations covering the entire survey limits showing high points, low points, grade changes, and at sufficient intervals to represent the general character of the terrain. location and elevation of lakes, rivers, streams or drainage courses on or near the surveyed area. description, location and elevation of benchmarks as well as coordinate system used in the survey.

- Geotechnical/Soil Investigations and analysis

The Consultant shall prepare site plans indicating the required boreholes locations for geotechnical investigations including depths, coordinates, geotechnical investigations specifications, required site and laboratory testing, etc. for subsequent execution as part of the present study.

- **For sanitary landfills**: To be defined by the consultant with a minimum of one borehole drilled per 3acres of the project area to a depth of 20 m below the ground surface.
- **For transfer stations**:To be defined by the consultant with at least one borehole per site to a depth of 20m below the ground surface.

Subsurface explorations or borings shall be executed by rotary drilling rigs at the selected locations.

- Laboratory Tests

Mechanical, physical and chemical laboratory tests shall be performed as needed, in accordance with the approved standards by an independent and accredited institute. A specialized independent laboratory chosen by the Consultant for carrying out the sampling and testing is subjected to a prior authorization from Client before commencement. The selected laboratory shall meet the relevant national and international standards.The Consultant shall identify the subconsultants/agencies well in advance, for various site investigations, sample collection and laboratories for conducting the required testing.

Parameters for lab testing are detailed in Appendix IV- *Detailed scope of work for pre-construction geotechnical investigations and schedule of prices*

3.2.4.3 Conclusions of site investigations

According to the investigations above the Consultant will provide technical confirmation of the proposed site selection, more specifically;

- Suitability of the sites investigated as regards the development of a sanitary landfill or transfer stations according tothe relevant national and international standards (incl. World Bank documentation) for landfill siting and construction;
- Recommend sites suitability of the varioussites;
- Recommend suitable measures to avoid, reduce or compensate identified risks;

3.3 TASK 2 :Feasibility study incl. preliminary design and economic evaluation and conclusion

Preliminary design includes civil, mechanical, and architectural/structural design. It comprises the description of all the mechanical processes and water systems to ensure proper integration into the structures. The preliminary design report shall include all drawings describing structural components and mechanical processes of the facility, and the ways in which they interrelate. The report should include an outline of materials and equipment specifications and cost estimates to about 10% accuracy. Operating cost estimates and the construction schedule are also required. The consultant should note that a good quality of preliminary design should drastically reduce the risk of changes in the future.

3.3.1 Sanitary Landfill

The Consultant shall prepare a site development plan for the lifespan of the sanitary landfill – expected between 20 to 25 years - based on forecasts of waste generation obtained and validated earlier. In this task, the Consultant shall prepare all required preliminary architectural and general engineering designs, drawings, calculations, plans and cost estimates for all site development worksas per standards and rules, including:

- The exact location of the sanitary cell in the landfill site (coordinates and topography)
- Site layout plans including preparation works, internal roads, access roads, auxiliary facilities as deemed necessary, connection to external facilities and utilities, etc….
- Proposed phasing of storage capacity development
- General access roads design, profiles and cross sections;
- General leachate collection system, leachate zone sections, pumping, sump/ reservoir, storage pond, on-site treatment, drainage and pumping, layouts, sections, and profiles;

- Municipal utilities at the landfill site (power supply and water supply requirements & layouts);
- General layouts for the landfill cell closure works, final reshaping and plateau construction, final side slope development, final capping cover;
- General layouts for auxiliary offices car parking etc.

Preliminary design shall include an analysis of alternative options and the Consultant will reach preliminary agreement on technical solutions with the Client, based on indicative landfill design and preliminary costs estimate. The analysis shall include sustainable and practicable options for the management of leachate, including collection, transfer, storage, and on-site treatment and suitable discharge.

The Consultant shall develop a set of design specifications based on acceptable requirements & standards and will propose a preferred set of measures for all the essential components including the following:

- Leachate barrier system
  - Design of leachate barrier system
  - Leachate extraction and level-control system
- Leachate storage and disposal
  - Conduct a water balance calculation
  - Leachate storage capacity
  - Leachate treatment and disposal
- Stormwater management
  - Erosion control
  - Sediment control
- Water quality monitoring
  - Leachate monitoring
  - Stormwater monitoring
  - Ambient surface water monitoring
  - Groundwater monitoring
- Landfill gas management and monitoring
  - Landfill gas control
  - Landfill gas surface emissions monitoring
  - Landfill gas sub-surface monitoring
  - Gas accumulation monitoring in enclosed structures
  - Emissions from combustion of landfill gas
  - Microbiological gas treatment systems
  - Gas control measures at the receptor
- Amenity issues: odour, dust, noise, litter and fire control
  - Odour control
  - Dust control
  - Noise control
  - Fire prevention
- Waste acceptance and site security procedures including wheighing of incoming waste
- Covering of waste
  - Daily cover
  - Intermediate cover

- Alternative daily cover materials
- Additional covering requirements for special wastes

- Final capping and revegetation
  - Final capping requirements
  - Monitoring the cap's integrity and performance
  - Justification of alternative capping
- Closure
  - The closure plan
  - Development on closed landfill

3.3.2 Transfer stations

The preliminary design will be based on a site-specific evaluation of waste volumes to be managed at each location depending on respective catchment areas. It is expected that a transfer capacity of about 100 to 200 tons per day will be required. The Consultant will define parameters such as types of waste, suitable technology for transporting and processing waste as well as secondary functions (access to citizens, material recovery, vehicle maintenance).

Design shall satisfy all the requirements including :

- Applicable Regulations, Federal, State and Local Regulations, Compliance Inspections regime
- Determining Transfer Station Size and Capacity
- Future Expansion
- Types of Waste Accepted
- Host Community Agreements
- Transfer Station Design and Operation
- Site Design Plan and Layouts for Main Transfer Area Design including weighbridge.
- Types and basic specification of Vehicles That Use a Transfer Station
- Operations and Maintenance Plans
- Waste Screening, separation and sorting Process
- Highlighting important Environmental concerns and issues
- Traffic Routes, Management, Control and supporting facilities
- Noise Assessment and Control
- Odors control
- Air Emissions – all aspects
- Storm Water Quality and possible conservation facility
- Vectors control
- Litter control
- Safety and Occupational Safety, fall prevention, Personal Protective Equipment
- Exposure to Potentially Hazardous Equipment
- Facility Oversight, including identified approaches
- Reporting System
- Resources Identification
- Identification of Flood Plains and Flood Prone areas
- Washout Preventions
- Fault Areas and Seismic Impact Zones, and Unstable Areas

3.3.3 Financial and Economic Analysis

The objective is to assess whether each relevant entity will have funding to cover long-term costs as needed to ensure project sustainability, and identify actions needed to ensure project financial sustainability. For this the consultant will conduct the following tasks:

- Prepare CapEx and OpExcost estimates for each facility at **+/-10% accuracy** based on recent projects and including transportation costs between the transfer station and the landfill. The Block Cost Estimates shall take in to account the prevailing Government of India /Government of Kerala guidelines to enable the procurement of Contractor
- Prepare financial projections and conduct financial analyses of the executing and implementing entities, and incremental recurrent costs, to determine the financial impact of the project on these entities as well as financial sustainability;
- Review proposed cost-recovery and tariff policies, including affordability;
- Conduct financial evaluations including sensitivity analyses of the operation;
- Identify risks project financial sustainability or viability;
- Undertake an economic evaluation of the project components to estimate the economic benefits covering, among other things, demand analysis, least economic cost analysis, economic cost and benefit analysis, economic internal rates of return, average incremental economic costs, sensitivity analysis, risk analysis, poverty impact ratios, affordability analysis, and assessment of subsidies (if applicable).

3.3.4 Institutional Analysis

The consultant will review the existing institutional framework for waste management, assess the institutional capacity of the different entities involved in the development and operation of the project and identify potential bottlenecks.

More specifically the consultant will:

- Identify key stakeholders, local administration structures, and relationships among key institutions at the National, StateandULB levels, along with policies, regulations, strategies;
- Recommend an institutional framework for efficient development and managementof the system with clearly defined responsibilities, required qualification of personnel, and budget allocation and flow of funds;
- Identify project implementation and O&M entities after project completion considering the capacities of concerned entities and prepare realistic institutional arrangements;
- Review existing policies, guidelines, and legal frameworks for private sector engagement in the design, construction and operation of the SWM services including landfill management;
- Assess the managerial, technical, and administrative capacity of the relevant entities; and suggest action plan to build their capacities to minimize risks; and provide suggestions to improve governance and management, and to strengthen capacity for system operation.

3.3.5 Recommendations ofthe preferred delivery model for infrastructure development

Depending on the conclusion of the feasibility study for each cluster, the consultant will examine options and recommend the preferred delivery option for the design, construction and operation of the system, or alternative solutions in case feasibility cannot be demonstrated.

This could include supporting the Client in conducting an initial market soundingexerciseto gather feedback regarding the various procurement options with reputed contractors in the market.

Report shall present an analysis of various procurement options based on (a) specific context of each cluster, (b) outcome of marketsounding exercise, and (c) Client's inputs. Report should presenta comprehensive option analysis and make a specific recommendation for each cluster.

3.3.6 Validation

All data, findings and conclusions will be compiled in a Feasibility Report. This report will be presented to KSWMP SPMU for review, comments and final validation.

3.3.7 Conclusion

At the end of the study, the Consultant should be able to assert the feasibility of the proposed project, and clearly conclude in order to support the next steps of the proposed development.

3.4 TASK 3: Assistance to tendering and contract negotiation

- Based on the selected project delivery model, prepare the bid documents for selection of the Contractor and finalise the documents in consultation with the Client.
- Support the Client by preparing the response to queries during the bid process and undertaking the Technical Evaluation of the bids.
- Assistance to the Clientthroughnegotitions until the signing of Contract Agreement

4 DELIVERABLES

4.1 Deliverable 1: Inception report

This report should describe any problem encountered in the understanding or planning of the intervention, confirm the timeline and content of deliverables, including any re-alignment of activities in regard to the intended results, when deemed necessary. The report will detail the approach, methodology, tools and technologies employed for completing the assignment, as well as duly justified changes that may be required to the initially proposed approach. The report shall also outline the plan according to a two-step approach:whilefirst work package is expected to deliver the outputs for the waste clusters where land parcels are identified, andthen moving to deliver remaining clusters as part of the second work package when respective land parcels are identified.

The report should clearly identify and list stakeholders to be consulted during the project and collate all data, information and literature collected at the time of the report, identifying missing documentation viewed as critical in the completion of the study.

The consultant shall describe roles and responsibilities of its team members as well as internal processes to ensure the quality of deliverables.

While the Inception Report is expected to cover the full scope of the assignement including all waste clusters, following deliverables are planned in a two-step manner, while first set of outputs focuses on initial clusters where land are available, and second setis for the clusters where land will be identified later on. The two sets of outputs are to be delivered in a timeline which is outlined in following section.

4.2 Deliverable 2: Site Investigation Report

The site investigation report covers an in-depth analysis of all investigations conducted at the different sites including:

- Site screening checklist reviewed, when existing or completed
- Detailedsubsurface geotechnical investigations results
- Water testing results
- Topographic survey
- Hydrology and hydraulics
- Other important data associated with the project sites.

The results of the laboratory and field data shall be studied by the Consultant and tabulated in standard forms.

4.3 Deliverable 3: Preliminary design report

Based on deliverables 1 and 2, this report shall include all preliminary design documentation as described above, including calculation and drawings, and clearly portray all pros and cons of the preferred option, to provide Client with suitable elements to make final approval on the most informed basis.

4.4 Deliverable 4: Feasibility Report

The feasibility report will compile all data and present findings in a structured format so as to provide a clear conclusion regarding the feasibility of the proposed system.

The Report will specifically includetables and illustrations to present all informationinalegible format.

A draft FS report will be issued and communicated to SPMU. The final FS report will incorporate comments from the Client.

4.5 Deliverable 5: Bid Documents for the procurement of works

Based on the preferred delivery model, the consultant shall prepare the bid documents for the selection of the contractor for the development of the regional infrastructure. The Consultant shall prepare the draft bid documents, final bid documents incorporating the comments from the Client, the response to queries during the bid process,the evaluation of the bids .

5 STAFFING AND RESPONSIBILITIES

The consulting company or consortium should have significant experience in delivering the objectives of this assignment. The company / consortium should have several years' experience in municipal engineering services, solid waste sectors, planning for solid waste management infrastructure development/investments, landfill site rehabilitation, preliminary and detailed designs, cost estimates, as well as having successfully worked on two (02) projects (landfill development).

6 PROJECT DURATION

Services are anticipated to be completed within a maximum period of 45 weeks from date of contract signing.

The consultants are expected to mobilize within one month of contract signing. All key experts shall make themselves fully available for their respectivedurationof involvement under the assignment.

Sufficient time should be allotted for document approval and obtain all authorizations needed for site investigations and preparation of surveys and investigation.

All written deliverables will be in English language.

7 SCHEDULE OF DELIVERABLES

Deliverable	**Duration** **(in calendar week)**
Deliverable 1 Inception Report	3 weeks after contract signing date
Deliverable 2 Site Diagnostic Report	16 weeks after contract signing date
Deliverable 3 Preliminary design report	22 weeks following contract signing date
Deliverable 4a Feasibility report (draft) including recommendations on project delivery model	30 weeks following contract signing date
Deliverable 4b Feasibility report (Final)	32 weeks following contract signing date.
Deliverable 5a Bid Document for Selection of Contractor (Draft)	35 weeks following contract signing date.
Deliverable 5b Bid Document for Selection of Contractor (Final)	37 weeks following contract signing date.
Deliverable 5c Support to Client until contract signing	37 to 45 week following contract signing date.

All costs will be factored into the financial proposal of the consultancy, including for geotechnical and soil investigations that will be paid based on the unit cost proposed following admeasurementmethodology..

Each deliverable shall be submitted in draft format as 2 hard copies and 1 electronic copy, then the final version incorporating all Client's remarks shall be submitted in 2 hard copies and 1 electronic copy.

All data, information, documentation, interview and meeting reports, analysis and modelling, used to inform the deliverables should be organized into a directory of clearly labelled folders, sub-folders and files, and delivered on 3 external hard drives (for those with limited internet connectivity) and in a 5 year cloud folder (for long term access and institutional memory).

8 GUIDANCE TO CONSULTANTS

8.1 Input from the Client

The following services and facilities will be provided by the Client without cost to theConsultant.

8.1.1 Data

The Client will provide the Consultant with access to all available data, detailed studies and reports, survey data, information, maps, drawings and internal documents relevant to the consulting services. All reference material will be loaned to the Consultant and shall be returned at the completion of the assignment or earlier, as may be requested. The consultants shall verify the correctness of the data/information provided by the Client and satisfy themselves with the accuracy of data/information /material before these are used. Data/information/material provided to the consultants shall remain the property of the originating agency and shall be provided solely for the purpose of the work conducted under this contract. Apart from data/information provided by the Client and that which the consultants could procure from other agencies, the consultants shall be responsible to collect any other data/information required for the assignment, through field survey and investigations. The data, documents and deliverables prepared by the Consultant as part of this Consultancy shall remain the property of the Client and shall not be used for any purpose other than that intended under these Terms of Reference without the permission of the Client.

8.1.2 Access

The Client will arrange for access by the Consultant to the site and communities likely affected by the project, etc., which the Consultant deems necessary to visit and to conduct field investigations in connection with performing its duties. Access to the key officials in the city and local authorities concerned with subjects related to the assignment will also be arranged by the Client. Further, introduction letters will be prepared and communicated to concerned authorities regarding the scope of work of the consultants and type of supports they require from these authorities.

The consultants must include in their financial proposal logistical requirements, such suitable vehicle(s) (including drivers, fuel and vehicle maintenance) for official site visits, necessary transport and/or allowances for site staff, functional site offices, telephones, office furniture and equipment, surveying and testing equipment even when subcontracted, as well as administrative staff.

9 KEY STAFF

The Interested consultants will be expected to demonstrate or provide explicit information/ evidence of their qualification to perform this assignment, in their profiles, in the areas covered by the project as

indicated above. Firms should have a specific and proven competence and experience in design, supervision, procurement, and contract administration of tasks delineated in the ToR.

The Consultant shall provide the required staff and qualifications to manage all the different tasks of the assignment. The Consultant should specify their project management, methodology & approach.

Regardless the below mentioned key staff, it will be the Consultant's full responsibility alone to bring additional supporting staff to achieve the required scope of work on time without any additional fees.

Client reserves the right to reject and/or instruct removal of staff due to non-performance.

	Specialist	**Experience & Qualifications**	**Years of Experience**
K 1	Team Leader/Civil Engineer (Civil Engineer) Full time International	Qualification: MSc in Civil Engineering Solid experience in the planning and design of MSW facilities particularly sanitary landfills ,leachate management systems and transfer stations. Specifically, at least 15 years of experience in managing similar scale and complex landfill engineering projects, with international work experience. The Team Leader should demonstrate the ability to work with others and lead a project team. The team leader will manage the entire assignment process and will be responsible for all deliverables, ensuring good quality standards.	15
K 2	Solid waste management specialist Civil / Environmental Engineering	Qualification: MSc in Civil Engineering or Environmental engineering Strong experience in the design, construction, and operation of sanitary engineered landfills, landfill liner barrier protection systems, leachate management systems and planning and design of transfer stations. Waste management and urban infrastructure projects At least 3 assignments in similar projects.	10
K 3	Hydro-geologist Expert	Qualification: MSc in Geology or Hydrogeology Experienced in landfill construction, infrastructure and utilities Surface and ground water investigations, hydrology, hydrogeology. At least 2 assignments in similar projects.	10

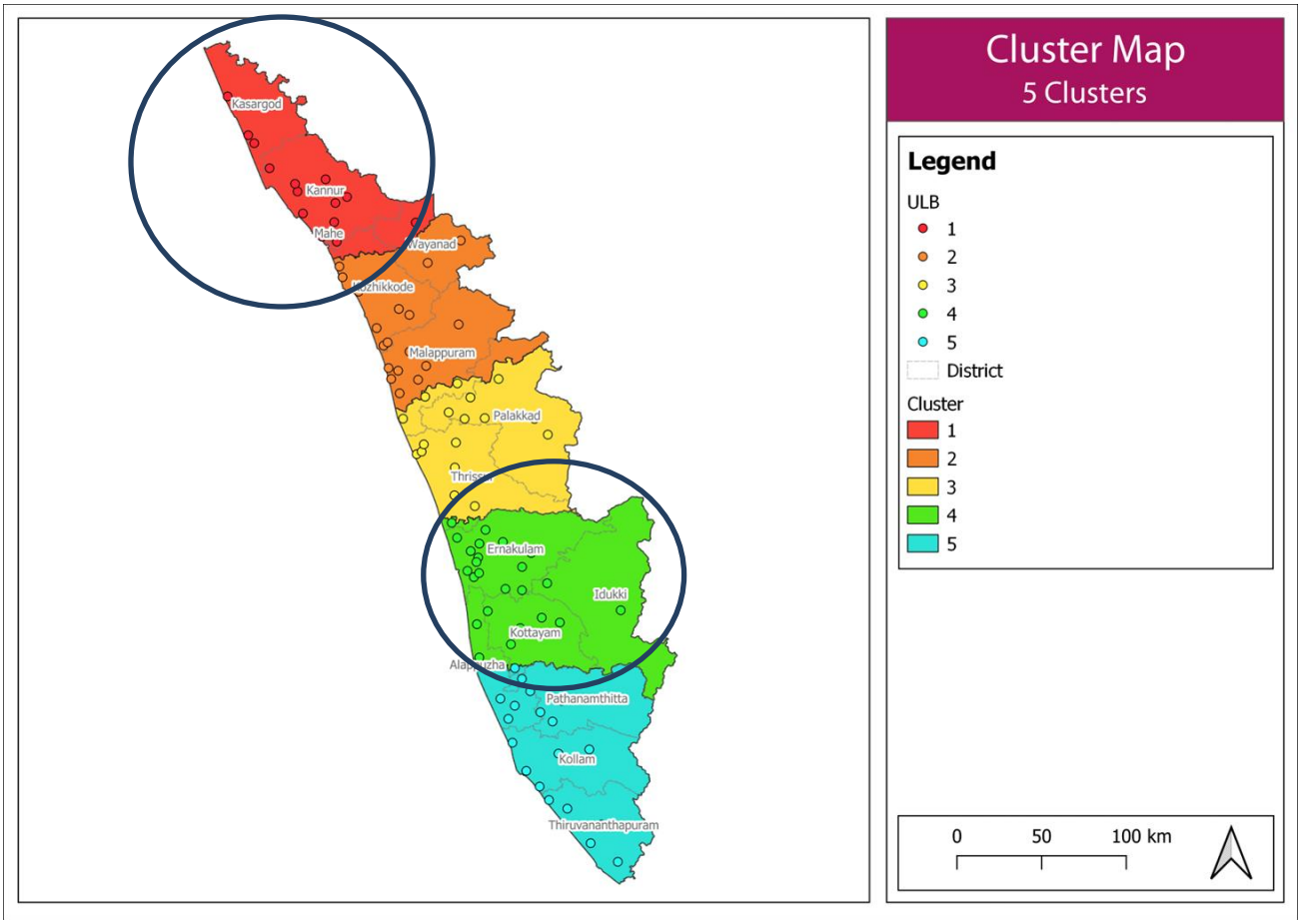
K 4	Geotechnical/ Material Engineer	Minimum BSc degree in geotechnical / material / soil engineering Experienced in landfill constructions and barrier systems materials and specifications Quality assurance and laboratory testing At least 2 assignments in similar projects.	10
K 5	Electro-MechanicalEngineer	Minimum BSc degree in electro mechanical /engineering from accredited university Experienced in Solid wastefacilities, construction & infrastructure.	10
K 6	Road Engineer	Minimum BSc degree in civil / transportation engineering from accredited university At least 10 years of practical experience in Road construction and upgrade works Relevant experience to Solid waste constructions & infrastructure.	10
K7	Procurement Expert	Minimum Master in Engineering from an accredited university At least 10 years of hands-on procurement experienceinurban sector infrastructure projects. Experience in Waste Management is desired.	10

Appendix II – Regional waste cluster plan

The present study only concers clusters 1 and 4 as shown below.

- Cluster 1 includes 1 SLF site and 4 TS sites
- Cluster 4 includes 1 SLF site and 8 TS sites

Cluster	No. of ULBs	ULBs
1	14	Anthoor, Iritty, Kanhangad, Kannur, Kasaragod, Koothuparambu, Mananthavadi, Mattannur, Neeleswaram, Panoor, Payyannur, Sreekandapuram, Thalassery, Thaliparambu
2	19	Feroke, Kalpetta, Koduvally, Koilandi, Kondotty, Kottakkal, Kozhikkode, Malappuram, Manjeri, Mukkam, Nilambur, Parappanangadi, Payyoli, Ramanattukara, Sulthanbathery, Tanur, Thirur, Thirurangadi, Vadakara
3	17	Chalakudy, Chavakkad, Cherupulassery, Chittoor-Thathamangalam, Guruvayoor Township, Iringalakuda, Kunnnamkulam, Mannarkkad, Ottappalam, Palakkad, Pattambi, Perinthalmanna, Ponnani, Shornur, Thrissur, Vadakkancherry, Valancherry
4	24	Alappuzha, Aluva, Angamali , Cherthala, Eloor , Erattupetta, Ettumanoor, Kalamassery, Kattappana, Kochi, Kodungalloor, Koothattukulam, Kothamangalam, Kottayam, Maradu, Muvattupuzha, Pala, Paravoor, Perumbavoor, Piravam, Thodupuzha, Thrikkakara, Thrippunithura, Vaikom
5	19	Adoor, Attingal, Changanassery, Chengannur, Harippad, Karunagapally, Kayamkulam, Kollam, Kottarakkara, Mavelikkara, Nedumangad, Neyyattinkara, Pandalam, Paravur, Pathanamthitta, Punalur, Thiruvalla, Thiruvananthapuram, Varkala


Cluster Map
5 Clusters
Legend
ULB
1
2
3
4
5
District
Cluster
1
2
3
4
5
Kasargod
Kannur
Mahe
Wayanad
Malappuram
Palakkad
Ernakulam
Idukki
Kottayam
Pathanamthitta
Kollam
Thiruvananthapuram
0
50
100 km

Appendix-III:Site Screening checklist

Criteria for SLF site selection	1. SWM Rules 2016	2. CPHEEO Guidelines	3. CPCB Guidelines***	4. WBG guidelines	PIM	EMF	TDF-SMF / RPF	Resulting criteria	Selected site:- ---------
General Compliance				National and local requirements and internationally accepted standards		Whichever is more stringent among 1, 2,3 & 4	Comply with the exclusion criteria provided in TDF-SMF and RPF	Avoid any area which shall be excluded as per national, state existing rules, laws incl. archeological, natural habitats, eco-sensitive areas (check status with local body, archeology dept geology, forests, wetlands, biodiversity authorities, PCB)	
Specific Prescriptions									
Capacity	20-25 years				Depending on the availability of land area	Whichever is more stringent among 1, 2, 3 & 4		20-25 years	

Criteria for SLF site selection	1. SWM Rules 2016	2. CPHEEO Guidelines	3. CPCB Guidelines***	4. WBG guidelines	PIM	EMF	TDF-SMF / RPF	Resulting criteria	Selected site:- ---------
Groundwater table	Bottom liner 2 m above water table			1.5 m above 10-year high level 10-year groundwater recharge	Bottom liner 2 m above water table			2 m above water table	
Outer Buffer	To be prescribed by local authorities	500 m 100 TPD 400 m 75–100 TPD 300 m 50–75 TPD 200 m 10–50 TPD 0 up to 5 TPD	200m	Add Adequate buffer zone between the facility and the external environment or locate facilities away from sensitive receptors	NA			500 m 100 TPD 400 m 75–100 TPD 300 m 50–75 TPD 200 m 10–50 TPD 0 upto 5 TPD	
Disaster waste management capacity	Specific cell to be added	NA			NA			Specific cell to be added for disaster waste management	
Specific Exclusions									
Distance from airport	20 km away from Airports / Airbase& if 10-20 km get NOC		20 km	3 km	20 km away from Airports /	Whichever is more stringent among 1, 2, 3		20 km from airport / Airbase	

Criteria for SLF site selection	1. SWM Rules 2016	2. CPHEEO Guidelines	3. CPCB Guidelines***	4. WBG guidelines	PIM	EMF	TDF-SMF / RPF	Resulting criteria	Selected site:- ---------
Distance from rivers	100 m away from river	100 m from flood plain	100 m away from river	Should not be within 300 m down gradient of cell	100 m from flood plain		No habitation downstream dependenton rivers	100 m from river, flood plain and no river, stream 300m down gradient of cell	
Distance from pond, lake waterbodies	200 m from a pond	200 from any water body	200 m from a pond		200 from any water body		No habitation dependent on water body upto 500 meters from the site	200 from any water body	
Distance from water supply	200 m from water supply wells	500 m	500 m from centerline of water supply wells	500 m down gradient**	200 m			500 m from water supply	
Distance from Highways/rail	200 m from highways/rail	500 m from C-line	500 m		200 m			500 m from C-line of highway, 200m from rail	
Distance from public parks	200 m from public parks	NA	500 m	NA	NA			500 m from public parks	
Distance from habitations	200 m from habitations	500 m	500 m	250 m	200 m			500 m from habitations	
	500 m from ST habitations						No ST settlements/habitation within 500 meters along the boundary.	500 m from ST habitations	

Criteria for SLF site selection	1. SWM Rules 2016	2. CPHEEO Guidelines	3. CPCB Guidelines***	4. WBG guidelines	PIM	EMF	TDF-SMF / RPF	Resulting criteria	Selected site:- ---------
Dependenceon site usage							No person/habitation using the site for any purpose (such as paths for accessibility, livelihood, grazing, etc)	No person/habitation using the site for any purpose	
Dispute							No litigation and no pending compensation cases	No litigation and no pending compensation cases	
Flood plain	100-year flood plain			10-year flood	100-year flood plain			100-year flood plain	
Coastal zones	CRZ		CRZ		CRZ			Any CRZ	
Wetlands	Any wetland				NA			Any wetland	
Sensitive areas	Critical habitat areas, sensitive eco-fragile areas				NA	Demarcated Forest areas or protected areas or their buffers Avoid any project which would further pollute sensitive areas (ascertain through EIA)		Any ecologically sensitive area and their buffers Avoid any project which would further pollute sensitive areas (ascertain through EIA)	

Criteria for SLF site selection	1. SWM Rules 2016	2. CPHEEO Guidelines	3. CPCB Guidelines***	4. WBG guidelines	PIM	EMF	TDF-SMF / RPF	Resulting criteria	Selected site:- ---------
Seismicity	500 m from fault lines			500 m from fault line + No significant seismic risk	500 m from fault lines	Whichever is more stringent among 1, 2, 3 & 4		500 m from fault line + No significant seismic risk, confirm seismic zone	
Drainage Distance from Non-meandering water (canal, drainage, etc.)	NA	30 m from drainage system			30 m from drainage system			30 m from drainage system	
Contaminated areas	NA	NA	NA	NA		Contaminated dumpsites by hazardous waste		Preexisting contamination by hazardous waste	
Dams	NA	NA	NA	NA		Impact on or due to dams or embankments		Any impact on or due to dams or embankments	

Criteria for SLF site selection	1. SWM Rules 2016	2. CPHEEO Guidelines	3. CPCB Guidelines***	4. WBG guidelines	PIM	EMF	TDF-SMF / RPF	Resulting criteria	Selected site:- ---------
Geology	NA	NA	NA	no underlying limestone, carbonate, fissured or other porous rock formations where the formations are more than 1.5 meter in thickness and present as the uppermost	NA	Whichever is more stringent among 1, 2, 3 & 4		No underlying limestone, carbonate, fissured or other porous rock formations where the formations are more than 1.5 meter in thickness and present as the uppermost geologic unit above sensitive	

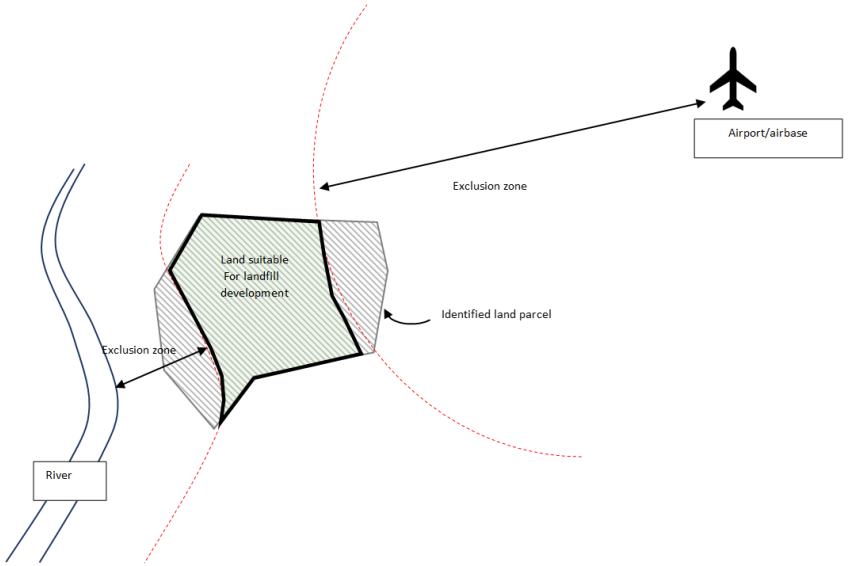
Explanatory notes

** WBG ES says "When host country regulations differ from the levels and measures presented in the EHS Guidelines, projects are expected to achieve whichever is more stringent. If less stringent levels or measures than those provided in these EHS Guidelines are appropriate, in view of specific project circumstances, a full and detailed justification for any proposed alternatives is needed as part of the site-specific environmental assessment. This justification should demonstrate that the choice for any alternate performance levels is protective of human health and the environment." >Consultant to check if any updation of national / state standards – for example discuss with PCB what they follow for permit.** Areas within the landfill boundaries should be located outside of the 10-year groundwater recharge area for existing or pending water supply development. Private or public drinking, irrigation, or livestock water supply wells located down gradient: - 500 meters (unless alternative water supply sources are readily and economically available and their development is acceptable to regulatory authorities and local communities)***Consultant to check whether KSPCB has formulated any guidelines.*

EXAMPLE OF EXCLUSION CRITERIA APPLICATION

CRITERIA ARE APPLIED FROM SITE BOUDARIES

MAPPING IS NEEDED TO EVALUATE CRITERIA IT MAY APPLY ONLY TO PART OF THE LAND PARCEL



Appendix IV. Detailed scope of work for pre-construction geotechnical investigationsand schedule of prices

1. Objectives

The objectives of the geotechnical surveys to be conducted at each prospective landfill and transfer site are as follows:

a) establish the geology, stratigraphy, and lithology of the materials present at each site, including depth to bedrock, if present, to a maximum depth of 20 m.

b) obtain the in-situ engineering properties of near-surface materials, including density, strength, and permeability, to establish foundation requirements for all new structures and for the development of the landfill.

c) permeability and attenuative properties of the soils to act as a barrier to leachate generation and groundwater contamination

d) obtain representative samples for subsequent laboratory testing in order to be able to establish foundation requirements for all new structures and for the development of the landfill. In addition, to establish the suitability of site materials for re-use in earthworks and site engineering; and

e) record the depth to groundwater to establish the groundwater table across the sites and to establish groundwater quality.

2. Standards

Analysis and testing shall be conducted on disturbed and undisturbed soil samples per American Standards for Testing and Materials (ASTM) or other comparable standards. All investigations and analyses shall comply with the Indian code of practice for subsurface investigation for foundations. Classification, by particle size, plasticity, moisture content, liquid limit, etc., shall be adequate to name each soil and indicate whether it's a mixture of silt, clay, sand, gravel, etc.

3. Boring, sampling, and testing criteria

The number, depth, spacing, and character of borings, sampling, and testing are established to produce the minimum subsurface data needed to (i) allow cost-effective geotechnical design and construction at the preliminary design stage, (ii) inform the environmental impact assessment study in terms of baseline and mitigation measures and (iii) characterize potential borrow sources for construction material.For this, the maximum depth considered is 20 meters to extend into competent material and below the depth of cut.

Parameter	**Criteria**
Number of boreholes	For sites less than 3 acres: 1 borehole For sites larger than 3 acres: 1 borehole per 3 acres
Number of trial pits	To be defined as part of geotechnical investigation plan
Boring Depth	20m maximum If N-values are more than 50 for a consecutive 5m, boring shall be stopped
Sampler	A standard core sampler with a diameter of 68mm (or 2-1/2 inches) shall be used to a depth of 5m for continuous strata sampling. Samples will be logged descriptively, indicating the soil types to evaluate the suitability for

	constructing the structures and impermeability.
Standard penetration test and N value	Commencing at 1.0m depth below existing ground level, conduct Standard Penetration Tests (SPTs) in boreholes every 1.5 m up to 20m to determine the load-bearing capacity of the different strata. SPTs shall be performed as per ASTM D1586- 84 in boreholes along with a collection of SPT samples at 1.5 m intervals or as necessary, including their labeling, packing, storage & transportation to an approved testing laboratory. If the N-value of 50 is encountered continuously at 5m, boring can be stopped.

Soil borrow sources: If soil borrow sources are identified at the time of the investigations, they will be communicated to the consultant by the Client's representative prior to commencing the investigations, to be included in the program.

4. Testing locations

Testing locations include the following (see map of sites):

i. 2 prospective landfill sites of approximately 25 acres each
ii. 12 prospective transfer sites of approximately 1 to 3 acres each

5. Access to sites

The Client shall facilitate authorizations for access to sites. In some cases, access to boring equipment may require the construction of temporary platforms. The Contractor will be responsible for the construction of these platforms. After completion of the investigations, all equipment and residual materials shall be removed from each site. Each site shall be restored as much as possible to the original conditions before the commencement of the work satisfactorily to the Client.
Several sites are currently occupied by waste deposits. The Contractor is not expected to remove any of the waste and will conduct the investigations in readily accessible areas of the site.

6. Geotechnical Investigations Report

The geotechnical investigation report shall comprise an Interpretative Geotechnical Report and be submitted one original, four copies, digital files for the report, and all the processing files soft copies. The report shall describe in detail the methodology, procedures, survey/test results, and evaluation of the survey/test results, including, but not limited to, the following contents:

i. Date and location of boring tests, elevation & coordinate of boreholes, maps showing the locations of the boreholes (scale: 1:1,000), description of the geographical & geological conditions and sub-surface stratigraphy of the site and the surrounding area.

ii. Geophysical test results and interpretation.

iii. In situ profiles of SPT/assessed soil strength.

iv. Cross-sections through the near-surface geology illustrating the distribution and sequencing of strata across each site.

v. Laboratory tests – w%, bulk and dry density, Atterberg Limits, particle size, proctor compaction and optimum moisture content, CBR, remolded permeability at 95% MDD, undrained strength (cohesive

materials), and cohesion and friction angle (non-cohesive materials), soil chemistry – sulfates, chlorides, and organic content, and cation exchange capacity as required);

vi. Summary table of all laboratory test results and classification of superficial soils into different groups based upon physical properties.

vii. Borehole and trial pit logs, detailed soil descriptions, depths and thickness of strata, and groundwater levels. Water levels shall be established when first encountered right after drilling and 24 hours after completion. The elevation at which groundwater (if needed) is lost or gained when using casing shall be observed and recorded.

viii. Groundwater map with water table depths and inferred flow directions.

ix. Recommendations on foundation type for structures, including derived bearing capacity and requirements for the protection of concrete foundations.

x. Recommendations for pre-loading/surcharging if required.

xi. Recommendations for groundwater control if required.

xii. Recommendations for cut and fill slope geometry, including assessing stability considerations under both static and dynamic loads.

xiii. Recommendations for the suitability of site materials for re-use in earthworks.

xiv. Recommendations for pavement design based upon determined CBR values and requirements for replacement of weak materials with suitable fill.

xv. An assessment of in situ permeability and the suitability of remolded/recompacted materials for use in basal lining systems.

xvi. Photographs showing scenes of the work and soil samples in core boxes, and

xvii. Copy of field book(s)

The Contractor shall submit geotechnical reports in the English language and as per the following instructions:

i. One (1) set of original prints of profile and cross sections which include major spot elevations and all the surveyed items. All original prints in ink shall be duly reviewed, dry-sealed, and signed by the licensed Chief Engineer.

ii. All field books, worksheets, field notes, sketches, traverse, and leveling computations shall be submitted. The field book should have the following entries.

- Survey crew names
- Daily weather conditions during the field survey work
- Inclusive dates when the survey was performed

All computations shall be signed by the person who computed the calculations.

7. Schedule of Prices

Important notice: The following schedule of prices is a comprehensive list of items for a standard program of investigations along with the tentatively expected quantities for each item. It is solely intended to provide a base for tenderers to understand the requested level of effort, evaluate proposals and, serve as a base for payment of actually performed services.

The actual program of investigations will be firmed-up during the execution of the Feasibility Study. As a result, it should be noted that not all items may be covered by the actual program and quantities are not contractual as they may also vary.

	Schedule of prices[3]				
item	**Fieldwork**	**Unit**	**Unit cost** *in INR*	**Est. quantity***	**Total cost** *In INR*
1	Mobilisation&Demobilisation for all sites incl. site to site move and site	Item	LS	1	
2	Site preparation (platforms) including supply and grading of fill material to provide access to borehole location	Item	LS	1	
3	In situ density	No.		16	
4	Drilling of Boreholes, incl. hole to hole move	No.		30	
5	Conversion of borehole to monitoring well	No.		4	
6	Standard Penetration Tests (SPT) at 1.5 m interval	No.		300	
7	Undisturbed soil samples (UDS) in boreholes, maximum 3 No/BH	No.		30	
8	In situ permeability test @ 1.5 m, 5.0 m and 10 .0 m (set of 3)	Set		16	
9	Pump/drawdown test	No.	LS	1	
10	Trial/test pits to 1.5 m depth, including bulk sampling	No.		30	
11	Collection of water samples from boreholes	No.		16	
item	**Laboratory work**	**Unit**	**Unit cost** *in INR*	**Est. quantity***	**Total cost** *In INR*
12	Grain size distribution (wet sieving and hydrometer)	No.		30	
13	Moisture content	No.		30	
14	Laboratory Moisture density relationships (ASTM D698)	No.		30	

15	Atterberg limits for cohesive soil (LL, PL & LS)	No.		30	
16	Triaxial tests of UDS (compressive tests)	No.		16	
17	Laboratory Permeability and Coefficient of permeability	No.		16	
18	California Bearing Ratio	No.		16	
19	Shear Box	No.		8	
20	Compaction proctor or modified proctor	No.		16	
21	Consolidation	No.		16	
22	Chemical analysis of groundwater from boreholes	No.		16	
23	Hydraulic conductivity of remolded soil materials	No.		16	
24	Soil chemistry (sulphates, chlorides, pH, organic content)	No.		2	
25	Cation exchange capacity	No.		2	
26	Interpretative Geotechnical Report for all sites	Item		1	
27	Hydrogeology Report	Item		1	
**Non contractual value*					
				TOTAL *In INR*	.....