



# कार्यालय नगर निगम, देहरादून।

(फोन नं. 0135 2714074) (ईमेल नं. nagarnigam.ddn@gmail.com)



पत्र सं. 26 /Legacywaste/2023-24

दिनांक 24/12/2024

	<b>Nagar Nigam Dehradun</b> Telephono &0135 -2714074 Website - <a href="http://www.nagarnigamdehradun.com">www.nagarnigamdehradun.com</a> E-mail - <a href="mailto:nagarnigam.ddn@gmail.com">nagarnigam.ddn@gmail.com</a>	
<p>Nagar Nigam Dehradun invites Request for Proposal (RFP) For Scientific Dumpsite Remediation of Legacy Waste and Land Reclamation through Bio-mining, Resource Recovery and Rejects Disposal at Danda Lakhaund site, Dehradun from eligible bidders having experience as indicated in the RFP document. Interested bidders are requested to procure the RFP document up to 13/02/2024 from e-tenders portal of government of Uttarakhand. Pre-bid meeting is scheduled at 12:00 noon on 31/01/2024. Any Addendum/Corrigendum including date of extension will be uploaded only on <a href="http://www.uktenders.gov.in">www.uktenders.gov.in</a>. The Municipal Commissioner have right to cancel tender at any stage without giving any reason. The last date for online submission of bids is 13/02/2024 at 3:00PM.</p>		
<b>Municipal Commissioner, Nagar Nigam Dehradun</b>		

## Copy to:

- 1- Honorable District Magistrate/ Administrator Nagar Nigam Dehradun for kind information
- 2- Editor Daily News Paper Hindustan Hindi (Uttarakhand)/Pioneer English (Uttarakhand & Delhi NCR) to publish the tender advertisement in minimum space as per reasonable rate for Nagar Nigam Dehradun.
- 3- Sh. Manish Pant, IT Officer to ensure uploading the RFP document in official website of Nagar Nigam Dehradun and E-procurement portal of State Government.

Municipal Commissioner  
Nagar Nigam, Dehradun

Scientific Dumpsite Remediation of Legacy Waste and Land Reclamation through Bio-mining, Resource Recovery and Rejects Disposal at Danda Lakhaund site, Dehradun



## NAGAR NIGAM DEHRADUN UTTARAKHAND

Request for Proposal (RFP)

for

**Scientific Dumpsite Remediation of Legacy Waste and  
Land Reclamation through Bio-mining, Resource  
Recovery and Rejects Disposal at Danda Lakhaund  
site, Dehradun**

October – 2023



**NAGAR NIGAM DEHRADUN (UTTARAKHAND)**

1 Patel Road Dehradun (Uttarakhand) – 248001

Telephone – 0135 - 2714074

E-mail: [nagarnigam.ddn@gmail.com](mailto:nagarnigam.ddn@gmail.com)

Website: [www.nagarnigamdehradun.com](http://www.nagarnigamdehradun.com)

अधिसूची अभियन्ता  
सहायक नगर आयुक्त नगर निगम, देहरादून

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### DISCLAIMER

The information contained in this Request for Proposal (the "RFP") document or subsequently provided to Bidder, whether verbally or in documentary or any other form by or on behalf of NAGAR NIGAM DEHRADUN ("Authority"), is provided to Bidder on the terms and conditions set out in this RFP and such other terms and conditions subject to which such information is provided.

This RFP is not an agreement and is neither an offer nor invitation by Authority to the prospective Bidder or any other person. The purpose of this RFP is to provide interested firms with information that may be useful to them in the formulation of their Proposals pursuant to this RFP.


Information provided in this RFP to the Bidder is on a wide range of matters, some of which depends upon interpretation of law. The information given is not an exhaustive account of statutory requirements and should not be regarded as a complete or authoritative statement of law. The authority accepts no responsibility for the accuracy or otherwise for any interpretation or opinion on the law expressed herein.


Authority also accepts no liability of any nature whether resulting from negligence or otherwise however caused arising from reliance of any Bidder upon the statements contained in this RFP.


Authority may in its absolute discretion, but without being under any obligation to do so, update, amend or supplement the information, assessment or assumption contained in this RFP.


The issue of this RFP does not imply that the Authority, is bound to select a Bidder or to appoint the Selected Bidder for the Works and Authority, reserves the right to reject all or any of the Proposals without assigning any reasons whatsoever.

The Bidder shall bear all its costs associated with or relating to the preparation and submission of its Proposal including but not limited to preparation, copying, postage, delivery fees, expenses associated with any demonstrations or presentations which may be required by Authority, or any other costs incurred in connection with or relating to its Proposal. All such costs and expenses will remain with the Bidder and Authority, shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by a Bidder in preparation or submission of the Proposal, regardless of the conduct or outcome of the Bidding Process.

  
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### List of Acronyms and Abbreviations

APM	Anti-Profiteering Measures
BG	Bank Guarantee
BOQ	Bill of Quantities
CCTV	Closed Circuit Television
CPCB	Central Pollution Control Board
CPHEEO	Central Public Health and Environmental Engineering Organization
CUM	Cubic Meter
DD	Demand Draft
DG	Diesel Generator Set
DPCC	Delhi Pollution Control Committee
DPR	Detailed Project Report
EHS	Environmental, Health and Safety
EMD	Earnest Money Deposit
ERP	Emergency Response Plan
ESIC	Employees State Insurance Corporation
FS	Financial Score
FY	Financial Year
GIS	Geographic Information Systems
GoI	Government of India
GPS	Global Positioning System
GST	Goods and Service Tax
ID	Identity Document
IEC	Information, Education, and communication
INR	Indian Rupee
IOT	Internet of Things
IP	Internet Protocol
ISI	Indian Statistical Institute
ISO	International Organization for Standardization
ITR	Income-Tax Return
JCB	J.C. Bamford Excavators Limited
JV	Joint Venture
KPIs	Key Performance Indicator
LOA	Letter of Acceptance
LTP	Leachate Treatment Plant
MIS	Management Information System


  
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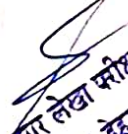


LTP	Leachate Treatment Plant
MIS	Management Information System
MoEFCC	The Ministry of Environment, Forest, and Climate Change
MoHUA	Ministry of Housing and Urban Affairs
MSW	Municipal Solid Waste
MSWM	Municipal Solid Waste Management
MT	Metric Ton
NABL	National Accreditation Board for Testing and Calibration Laboratories
NGT	National Green Tribunal
NHAI	National Highway Authority India
NND	Nagar Nigam Dehradun
NOC	No-Objection Certificate
PAN	Permanent Account Number
PBG	Performance Bank Guarantee
PCB	Pollution Control Board
PIM	Project Information Memorandum
PM	Particulate Matter
PMC	Project Management Consultancy
PSU	Public Sector Undertaking
PVC	Polyvinyl Chloride
RDF	Refuse Derived Fuel
RFID	Radio Frequency Identification
RFP	Request for Proposal
RSD	Retention Security Deposit
SBM	Swachh Bharat Mission
SBM-U	Swachh Bharat Mission – Urban
SCF	Segregated Combustible Fractions
SFO	Senior Finance Officer
SoW	Scope of Work
SPCB	State Pollution Control Board
SW	Solid Waste
SWM	Solid Waste Management
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Data Sheet/ Total Dissolved Solid
TFR	Technical Feasibility Report
ToR	Terms of Reference
TPD	Ton per Day

  
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Scientific Dumpsite Remediation of Legacy Waste and Land Reclamation through Bio-mining, Resource Recovery and Rejects Disposal at Danda Lakhaund site, Dehradun

TSS	Total Station Contour Survey
ULBs	Urban Local Bodies
VTMS	Vehicle Tracking Management System
WC	Water Closet
WTE	Waste to Energy

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## Specific Procurement Notice

**Request for Proposals Legacy Waste Remediation Services**

**Authority: Nagar Nigam Dehradun**

Contract title: Request for Proposals Legacy Waste Remediation Services

Country: India

Letter No. 26/legacy waste/2023-24

Date. 24/01/24



### Nagar Nigam Dehradun

Telephone &0135 -2714074

Website - [www.nagarnigamdehradun.com](http://www.nagarnigamdehradun.com)

E-mail - [nagarnigam.ddn@gmail.com](mailto:nagarnigam.ddn@gmail.com)



Nagar Nigam Dehradun invites Request for Proposal (RFP) For **Scientific Dumpsite Remediation of Legacy Waste and Land Reclamation through Bio-mining, Resource Recovery and Rejects Disposal at Danda Lakhaund site, Dehradun** from eligible bidders having experience as indicated in the RFP document.

Interested bidders are requested to procure the RFP document up to 13/02/2024 from e-tenders portal of government of Uttarakhand.

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**Municipal Commissioner  
Nagar Nigam Dehradun**



## Bid Data Sheet

Sr. No.	Particulars	Data
1.	Cost of Bid Document	INR 20,000 /- plus 18% GST (to be submitted in the form of Demand Draft (DD) (refer Clause 3.3 of Section 3)
2.	Earnest Money Deposit (EMD)	INR 53.00 Lakhs in the form of Demand Draft (DD) or Fixed Deposit Receipt (FDR) or Bank Guarantee (BG) valid for 3 months (Attached format Form -13) (refer Clause 3.4 of Section 3).
3.	Tender dates and schedule	
I	Publishing of Tender Document	24/01/2024 at 3:00 PM
II	Pre-bid Queries to be submitted by	30/01/2024 at 12:00 O'clock
III	Pre-bid Meeting / conference shall be in Meeting Hall, NAGAR NIGAM DEHRADUN, 1 Patel Road, Dehradun, Uttarakhand- 248001	31/01/2024 at 12:00 O'clock
IV	Online Bid submission end date	13/02/2024 up to 3:00 PM
V	Bid Opening Date	13/02/2024 after 3 PM or any other suitable date and time decided by the authority.
4.	Performance Security in the form of Bank Guarantee (BG)	5% of the Contract Value and it shall be valid till the expiry of 03 months after the project completion.
5.	Bid Validity Period	180 Days from the due date of Bidding
6.	Eligible Bidder for Bidding	Individual Bidder (Joint Venture/ Consortium is not allowed.)
7.	Method of Bid Submission	Online Submission - Technical & Financial Bid
8.	Site preparation, mobilization & installation of machineries and obtaining regulatory clearances.	3 Months (From the date of LOI/ Work Order)
9.	Project activities: Remediation of Legacy Waste, Bio-mining, Land Reclamation and Reject Disposal.	12 working months, after 3 months of site preparation, mobilization, and installation of machineries.
10.	Total project completion period	20 months from the date of award of work order including 3 months mobilization/site preparation period, 4 months monsoon period and 13 months of operation activities.
11.	Total Waste to be removed	Estimated Quantity: 4,18,374 m <sup>3</sup> (+/- 20%)
12.	Land to be reclaimed (Waste Spread Area)	Around 7.57 Ha. (100%). Further, the successful bidder is advised to reclaim 100% but not less than 90% of total 7.57 Ha of land under this project. In case the area is not reclaimed, the bidder shall produce a valid reason with the evidence approved by the PMC/NND officials for not able to reclaim rest area of the dumpsite. It is advised that bidder shall conduct their own survey to understand the site conditions

All the correspondence should be written, the written correspondence may be sent through email, or letter. All the communication and the bid submission should be addressed to the undersigned on the address below:



Scientific Dumpsite Remediation of Legacy Waste and Land Reclamation through  
Bio-mining, Resource Recovery and Rejects Disposal at Danda Lakhaund site, Dehradun

**To,**  
**The Municipal Commissioner,**  
**Nagar Nigam Dehradun.**  
1, Patel Road Dehradun, Uttarakhand, - 24800  
Telephone – 0135 - 2714074  
Website - [www.nagarnigamdehradun.com](http://www.nagarnigamdehradun.com)  
E-mail – [nagarnigam.ddn@gmail.com](mailto:nagarnigam.ddn@gmail.com) , [sbmnd@gmail.com](mailto:sbmnd@gmail.com)

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## 1. INTRODUCTION

### 1.1. Background

The Nagar Nigam Dehradun (herein after referred to as "NND" or "the Authority" in this Bid Document) is seeking proposals from eligible Bidders to undertake the works required for Scientific dump site reclamation through Bio-mining of legacy waste / un-processed municipal solid waste by excavation of complete mixed MSW from the dumpsite which underwent biological and physical degradation, resource recovery by using suitable mechanical sieving machine or any other suitable equipment / method, segregating, sorting, retrieving recoverable materials, storing, selling, diverting for recycling, dumpsite land reclamation, development of disposal facility and scientific residual Solid Waste disposal in disposal facility dump site during contract period and hand back of reclaimed land and disposal facility to the Nagar Nigam Dehradun at the end of contract period.

The details about the site are presented in the Project Information Memorandum (PIM): Annexure 1 provided in the end of this tender document.

The Nagar Nigam Dehradun (herein after referred to as "the Authority" in this Bid Document) is seeking proposals from eligible Bidders to primarily undertake the work for disposal of Legacy Waste through Bio-mining process for land reclamation, resource recovery and suitable disposal of residual inert from the Danda Lakhaund old dumpsite. The contract shall be awarded to the successful bidder (herein after referred to as "the Bidder" in this Bid Document) for a period of 15 months reckoned from the date of signing of contract agreement. The scope of work can be broadly classified in to following:


Bio-mining of approx. 4,18,374 m<sup>3</sup> (+/- 20%) of Legacy waste and suitable disposal of excavated material in line with SWM Rules 2016, CPCB guidelines 2019, MoHUA advisory 2020, related directions from Hon'ble NGT, rules, regulation, guidelines, statutory norms, and their amendments from time to time.


### 1.2. Current Scenario

Sr. No.	Description	Details
1.	Population (Census 2011)	8,03,983
2.	Present Waste Generation (2023)	400 MTPD estimated
3.	Dump site Location	Danda Lakhaund, Dehradun
4.	Approximate Total Legacy Waste at Site (Legacy Waste) to be processed for bio mining	4,18,374 m <sup>3</sup> (+/- 20%)
5.	Total Area of the Site	7.57 Hectare (75,729 sqm)

**Note:**

*No new waste shall be dumped at the Bio-mining project site after the LOI/ Work Order. Further, it is to clarify that there has been no fresh waste dumped since 2017 at the Danda Lakhaund dumpsite (the proposed site to be remediated under this project).*

  
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### 1.3. Scope of Work

The current project primarily intends to undertake the works required for remediation of Legacy Waste through Bio-mining process for land reclamation, resource recovery and suitable scientific disposal of residual waste from Danda Lakhaund Legacy Waste dumpsite. The contract shall be awarded to the successful bidder ("the Bidder") for a period of 15 months reckoned from the date of signing of contract agreement or the date of issue of necessary regulatory permission (if any) to the project, whichever is later.

The scope of work can be broadly mentioned, as follows:


- 1) Bio-mining of 4,18,374 m<sup>3</sup> (+/- 20%) Legacy waste and suitable disposal of excavated material. (As per the latest assessment report Part A & B on Characterization and Quantification of the stored waste at Danda Lakhaund Dumpsite attached as Annexure 4).
- 2) The broad scope of work for Service Provider will include the following:
  - Planning and Design
  - Establishment of the processing facility
  - Operations - Processing of legacy waste
  - Monitoring of the legacy waste management process
  - Project Closure
- 3) The section below outlines the key roles and responsibilities of Private Service Provider/developer across various stages of project development.


#### 1.3.2. Planning and Design

##### 1) Planning and Design of the facility

- a) The Bidder shall be responsible for the design and planning of the works, including process/ technology for remediation of legacy waste.
    - Validation of the DPR/ TFR shared by the authority.
    - Review/ validate the prepared DPR/ TFR for legacy waste. All the deviations from the original DPR/ TFR must be approved by the Authority.
  - b) The Bidder shall submit the detailed project implementation schedule with anticipated timelines for all the works to NND for approval, along with a detailed plan of action.
- 2) The Bidder needs to remove entire 4,18,374 m<sup>3</sup> (+/- 20%) of legacy waste from the total waste dumped at the Danda Lakhaund Legacy Waste dumpsite.

  
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reclaim the earmarked waste spread area of approximately 7.57 Ha (Hectare) and dispose the excavated material, without stacking them at site for not more than 30 days.

- 3) The area for the excavation of legacy waste, shall be earmarked by Bidder in consultation with the Authority, which shall be considered as Waste spread area for the scope of work. The brief site details are mentioned in *Annexure 1*.
- 4) The Bidder shall incorporate fully online/ computerized electronic automatic system in the design with latest technologies for surveillance and stage wise monitoring for the entire process using appropriate M&E tools at its own cost.
- 5) Obtaining clearances from statutory bodies:
  - a) The bidder shall obtain all required clearances from all statutory authorities as specified in the contract at his own cost.
  - b) The list of tentative permits/ approvals required are provided as part of *Annexure 2*.
  - c) The Authority shall facilitate and support the bidder in obtaining the project related approvals and clearances from various relevant authorities.

### 1.3.3. Establishment of the Processing Facility

- 1) The bidder shall set up the processes at the site with all the machinery required for bioremediation, processing, and disposal of legacy waste.
- 2) The work should be undertaken as per CPCB/ state PCB rules, SWM Rules 2016, and all other applicable rules and regulations, amended from time to time and all other applicable rules & regulations at the cost of the Bidder. Please refer to *Annexure 2* for required approvals and environmental clearances.
- 3) Deployment of necessary manpower, materials, equipment, tools and construction of plants and sheds and creation of facilities for handling, separating, segregating, storing, and weighing facilities for the operation of the plant and using only covered body vehicles for the transportation of materials taken out not limited to trommel of required sieve, shredder, screener, hopper, conveyors, and any other equipment as required with adequate capacity of motors.
- 4) Construction of office room facilities for the Project.
- 5) Sufficient machinery / equipment to clear the dumpsite as per the timelines mentioned in this tender document.
- 6) Security arrangement for the planned project site, machinery, equipment etc.

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- 7) The Bidder is advised to deploy best equipment or service with best technology available.

#### 1.3.4. Operations - Processing of Legacy Waste


- 1) The Bidder should use suitable methods and processes to excavate the legacy waste and must segregate the waste into as many kinds and categories as possible, like RDF, soil enricher, C&D, recyclables, inert material, etc.
- 2) Operations and maintenance of infrastructure, facilities, and amenities, for sieving the excavated old, dumped waste and storing the segregated materials before selling/taking out them from the project site.
- 3) The Bidder needs to deploy necessary workforce, materials, equipment, tools and construction of plants and monsoon sheds and creation of facilities for handling, separating, segregating, storing, and weighing facilities for the operation of the plant at minimum 1500 TPD and using only covered body vehicles for the transportation of materials taken out.
- 4) In case the Bidder is required to set up ancillary facilities at site like Fuel storage, DG set etc., the necessary permissions required are to be obtained by the Bidder at his cost. All handling of explosives, including storage, transport shall be conducted under the rules approved by the "Explosives Department of the Government."
- 5) The work should be undertaken as per CPCB/ state PCB rules, SWM Rules 2016, and all other applicable rules and regulations, amended from time to time and all other applicable rules & regulations at the cost of the Bidder.
- 6) Key activities to be performed by the bidder/ as suitable for the site are given below:

##### a) Stabilize open dumpsite:

The bidder should use methods and processes to stabilize the open dumpsite, control of foul odor and other such eco-friendly and non-polluting processes for minimizing the impact of the bio-mining activity in the adjacent areas of the dumpsite. The processes may include but not be limited to the following:

- **Loosening Legacy Waste:** Engaging chain dozer/ excavator and loosening the legacy waste.
- **Spraying the bio-culture,** over the loosened partially degraded old, dumped waste and to stabilize the same.
- **Spraying deodorizer,** over the waste as required to control odor.
- **Windrow making,** of partially degraded wastes for stabilization.

  
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- **Remediation/Drying of old waste before processing:** The old, dumped waste shall be remediated, dried before entering the processing or segregation facility. This dried waste weight entering the segregation facility shall be considered for the payment to the Service Provider.

**b) Transportation and processing of dry/ stabilized legacy waste to processing facility:**


- Shifting and loading of the old, dumped waste into the processing unit and segregating the materials size wise and type wise by engaging the workforce on both sides of conveyors with proper safety precautions.
- Processing the old, dumping waste on an everyday basis and segregating the recyclable materials and the enriched soil, debris like stone etc. Shredding of the remaining non saleable SCF/ RDF material with plastic etc. and converting them into SCF/ RDF.


**c) Transport segregated output/ by-products for disposal:**


- The bidder must transport the segregated output to the identified vendors at its own cost.


**d) Disposal of by-products/ segregated fractions:**

- Processing the legacy waste on everyday basis and segregating the recyclables material and the enriched soil, debris like stone etc. Shredding of the remaining non saleable RDF material with plastic etc., which has the calorific value of at least to 1500 kcal/kg and converting them into RDF.
- The material collected shall be disposed of by engaging suitable vehicles as per SWM Rules 2016 and applicable guidelines on the subject.
- Other wastes like Hazardous Waste, E-Waste; Bio-medical Waste (if any these is present in the MSW) and Construction & Demolition Waste shall be managed by the Bidder as per the applicable rules, regulations, statutory norms guidelines in close coordination with Independent Engineer/PMC and Authority, under the relevant rules & regulations as amended from time to time.
- The process and timelines for the disposal of by-products/ segregated fractions should be identified in the Work Plan prepared by the Service Provider and agreed with the Authority.
- Accumulation of the excavated materials shall be based upon the site conditions. Safe storage, selling, diverting for recycling, marketing of excavated fractions be the responsibility of the bidder.

  
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- The Service Provider can engage informal sector for segregation and further selling of the recovered waste to the agents/ aggregators/ recyclables as appropriate.
- The rubble or stones bigger in size (size bigger than 250 mm) shall not be carried for processing; it shall be stacked separately at dumping site. These shall be disposed of at a designated site identified by the Authority. No payment for their stones/rubbles shall be included in the processing fees to be paid to Bidder. **The rubbles bigger in size (>250mm) which shall be removed before weighing and shall not be included in total weight of the waste taken for the processing.**
- The revenue or the income from the sale of the segregated useful material such as reusable and recyclable, Compost, Soil conditioner, raw RDF, C&D, Soil or any other by- product materials shall go to the Bidders account, the Bidder will arrange the disposal at its own.
- In case of disposal of any inert/reject fraction in low-lying area or disposal of recovered soil/ bio-soil /soil enricher, the Bidder, at its own cost, will conduct a lab testing of such materials from an NABL accredited lab and MoEFCC recognized laboratory to check its TCLP characteristics or any other parameters as recommended by the Engineer-in- charge or applicable rules/guidelines. The Bidder shall submit the report of the same to the Authority.

**e) Leachate Treatment:**

- Setting up of provision for safe leachate collection, storage, reuse and recirculation and treatment at the site or safe disposal for treatment outside of site.

**f) Facility to control gas emissions:**

- The Bidder shall provide facility to control the gas emission if any as per Solid Waste Management Rules, 2016 and other statutory guidelines of the Government. **The successful bidder shall take measures to control the hazardous gases emission from dumpsite as per CPCB Guidelines for Disposal of Legacy Waste published in 2019**


**g) Payment for fleet management:**

- The Bidder shall be responsible for the payment to fleet management to dispose of the material recovered from the old, dumped waste.

**1.3.5. Monitoring Of the Legacy Waste Management Process**


- 1) Weighing of the waste managed by the Service Provider: The Service Provider shall weight the dried waste to be processed and the segregated by-products at the following stages during the process, as follows:


  
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- a) Dried/ stabilized legacy waste entering the processing facility, excluding stones/ boulders/ other material 250mm and above.
  - b) Weight of the by-products as an output of the processing facility; and
  - c) Weight of the by-products being transported for disposal.
- 2) Setting up of a weighbridge of required capacity or any other suitable system for weighing as approved by Authority for the measurement at all stages.
- a) This weighing system shall be fully online electronic, tamperproof, automatic system equipped with the latest technology along with backup server facility. Data of the weighing system shall be maintained properly for the entire contract period with backup server facility with IOT solution and dashboard display at office of Executive Engineer and shall be provided as & when required by DDN.
  - b) It shall be operated in CCTV surveillance with data storage for the entire contract period. For CCTV surveillance High-Definition IP based cameras in adequate numbers (as directed by DDN) shall be provided by the Bidder.
  - c) The bidder shall install the CCTV at all the required locations to be identified by the Authority to have the surveillance or to be monitored each process of the plant.
  - d) CCTV Recordings of operation of weighing system shall be provided as and when required by DDN officials and competent authorities.
  - e) Any malfunctioning in the operation of the weighing system shall be the responsibility of the Bidder.
  - f) In case of any malfunction/technical problem in the functioning of the weighing system, the same shall be rectified by the Bidder within a period of 24 hrs. During this period of failure, weighing of dumped waste shall be conducted at a private weighbridge located outside which shall be approved by DDN at the Bidder's cost and no additional charges shall be paid by DDN.
  - g) No data in the weighing system should be manually filled and it should be fully automated. RFID tag shall be installed on each truck and dumper carrying the waste. The complete weighing system shall be fully automated.
- 3) System in which all the vehicles are deployed with GPS tags and Vehicle Tracking Management System (VTMS) to detect tempering, track, and monitor the vehicles and hence efficiently plan the routing and resources for transportation system.
- 4) Setting up of systems for periodic monitoring of the KPIs as mentioned in Clause 7.3 of Section 7.


  
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- 5) The Bidder shall allow the any person authorized by the Authority to access the Site, to any place where work in connection with the Contract is being conducted or is intended to be conducted and to any place where materials or plant are being manufactured / fabricated / assembled for the works.
- 6) The Authority shall appoint a third-party monitoring agency for monitoring of the work progress and performance parameters as per the M&E Framework developed for the project.
- 7) The GIS system is to be integrated with Management Information System (MIS) for collecting information at micro level. The MIS system shall be as per the requirement of DDN and if any updates and revision is required during tenure of project the Bidder shall conduct such revisions at no extra cost.
- 8) The total system / mobile based APP for monitoring is required to be integrated with City Operation Centre/ monitoring center/Integrated Control and Command Center (if any). **The bidder shall make a provision for digital monitoring as per the requirement of the project monitoring process.**
- 9) The successful bidder shall provide the real time feed / monitoring of entire system through Web based Technology and integrated to Authority's website/Smart city's City/Operation Centre/ monitoring Centre (if any).
- 10) The successful bidder must create and provide a display board (screen), an online monitoring system, and access to the plant's operations for day-to-day monitoring purposes to the DDN office.
- 11) Perform periodic monitoring of progress of work monthly/ quarterly in three phases, as per the M&E Framework for the project:
  - a) Phase I: Design and Build
  - b) Phase II: Operation & Maintenance
  - c) Phase III: Closure
- 12) Provide/setup field laboratory with the required laboratory equipment.
  - a) Every month, third party verification should be done from NABL accredited lab and the reports for the same shall be submitted along with monthly bill/progress report.
  - b) The Service Provider should bear the charges of the testing.
  - c) The testing reports factors of processed waste like pH, salinity, conductivity, TDS etc. shall be within permissible limit.
- 13) The Service Provider shall adhere to Health and Safety norms as per the industrial standards in the work area and the site premises.

  
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14) Documentation regarding disposal of waste, as follows:

a) The Bidder shall submit necessary supporting documents, to ensure the safe disposal of the excavated material, to the Corporation on quarterly basis. This may include, but not limited to the following:

➤ **Combustible Fraction/RDF:** Co-processing certificate from the industry/organization on their letterhead, where such fractions will be channelized, to be obtained for the quantity of RDF they have used for co-processing. The Certificates must have unique Reference Numbers and contact numbers of person/s to whom the client can talk for verification of its originality. The certificates should also mention their GST Number and full address. A copy of NOC taken by the industry/organization from the State Pollution Control Board may also be obtained. In all the cases, weigh bridge slips may be kept in original for verification throughout the contract period.

➤ **Recyclables:** Proper certificates/documents for the channelization of the recyclables to the recyclers must be obtained. The certificates must be on their letterhead, mentioning their GST Number, and full address with contact number. A copy of registration taken by the recyclers from the respective ULB/SPCB may be obtained to ensure that they are genuine recyclers. Copy of past record of 3 years operations may also be collected from the recycler, such as ITR, production details, sales record, etc.

In case of supplying to the traders, the following documents may be obtained:

— Any internal document from the company registering the sale like Invoice/ Delivery Challan which essentially mentions the name of the commodity, quantity, date etc.

— A photograph of the material loaded over the vehicle clearly showing the vehicle and it must match the Vehicle number mentioned in the Invoice. The photograph taken must have the date marked on the same.

In all the cases, weigh bridge slips may be kept in original for verification throughout the contract period.

➤ **Soil Enricher:** The Soil Enricher may be used for the following applications, like Argo-forestry, Afforestation, Parks, Landscaping, or any other application barring non-food-based crops.

In case the land for the disposal belongs to the government departments (like NHAI, Forest department, Public Works Department, Municipal Corporation, etc.) then the contractor shall produce:

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- An acceptance letter from the department on the quantity in truck loads/ Metric tons clearly mentioning the application for which it is used.
- A before and after picture of the site where the same has been used may be obtained by the contractor with the dates marked on the same along with latitude and longitude.

In case the land belongs to a private person/company, then:

- The contractor needs to sign a NOC with the landowner that he understands the soil must be used for the specific purpose.
- Contractor also must obtain some proof showing that the land belongs to the said property owner or the person to whom the same is supplied has an understanding the original property owner for using the material for the specific purpose.
- A before and after picture of the site where the same has been used may be obtained by the contractor with the dates marked on the same along with latitude and longitude.

➤ **Inert Soil/ C&D material:** The inert stones generated from the process need to be used for filling up low lying areas, mining quarries.

In case the low-lying areas where the stones are being filled up belongs to the government departments then the contractor need to produce:

- An acceptance letter from the department may be obtained on the quantity in truck loads/ Metric Tons clearly mentioning the application for which it is used.
- A before and after picture of the site where the same has been used may be obtained by the contractor with the dates marked on the same along with latitude and longitude.

In case the land belongs to a private person/company, then:

- The contractor needs to sign a NOC with the landowner that he understands the stones must be used for the specific purpose.
- Contractor also must obtain some proof showing that the land belongs to the said landlord or the person to whom the same is supplied has an understanding the original landlord for using the material for the specific purpose.
- Contractor also must obtain a letter mentioning the number of truck loads/Metric Tons that has been dumped in the said site once the site is filled up.

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— A before and after picture of the site where the same has been used may be obtained by the contractor with the dates marked on the same along with latitude and longitude.

In case the Contractor plans to supplying such fraction to the C&D processing facilities for further applications of reuse and recycling, then utilization certificate on the quantities taken on quarterly basis needs to be produced as supporting document.

### 1.3.6. Bio-mining of Legacy Waste and Disposal of excavated material

- 1) The Bidder needs to remove entire 4,18,374 m<sup>3</sup> (+/- 20%) of legacy waste (from the total waste dumped at the Danda Lakhaund dumpsite Site, reclaim the earmarked waste spread area of approximately 7.57 Ha (Hectare) and dispose the excavated material, without stacking them at site for not more than 30 days.
- 2) In total, the Danda Lakhaund Landfill Site holds approximately 4,18,374 m<sup>3</sup> (+/- 20%) Tons of legacy waste spread in approximately 7.57 Ha (Hectare) of land area. The area for the excavation of 4,18,374 m<sup>3</sup> (+/- 20%) Ton's quantity, shall be earmarked by Authority in consultation with the successful Bidder, which shall be considered as Waste spread area for the scope of work. The brief site details are mentioned in Annexure 1.
- 3) The Bidder should use suitable methods and processes to excavate the legacy waste and must segregate the waste into as many kinds and categories as possible, like RDF, soil enricher, C&D, recyclables, inert material, etc.
- 4) The Bidder needs to deploy necessary workforce, materials, equipment, tools and construction of plants and monsoon sheds and creation of facilities for handling, separating, segregating, storing, and weighing facilities for the operation of the plant at minimum 1500 TPD and using only covered body vehicles for the transportation of materials taken out, not limited to:
  - a) Installation of trommel or automated segregation machines of required sieve sizes with necessary shredder, density separator, screener, metal separator, hopper, conveyors, or any other required machinery with adequate capacity of motors and pulleys.
  - b) Spraying the bio-culture over the loosened partially degraded legacy waste and windrow making of partially degraded wastes for stabilization.
  - c) Spraying deodorizer over the waste as required to control odor.
  - d) Shifting and loading of the legacy waste into the hopper and segregating the materials size wise and type wise by engaging the workforce on both sides of conveyors with proper safety precautions.

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- e) Processing the legacy waste on everyday basis and segregating the recyclables material and the enriched soil, debris like stone etc. Shredding of the remaining non saleable RDF material with plastic etc., which has the calorific value of at least to 1500 kcal/kg and converting them into RDF.
  - f) The material collected shall be disposed of by engaging suitable vehicles as per SWM Rules 2016 and applicable guidelines on the subject.
  - g) Other wastes like Hazardous Waste, E-Waste; Bio-medical Waste (if any these is present in the MSW) and Construction & Demolition Waste shall be managed by the Bidder as per the applicable rules, regulations, statutory norms guidelines in close coordination with Independent Engineer/PMC and Authority, under the relevant rules & regulations as amended from time to time.
  - h) Monitoring and recording all the activities to account for the quantity and quality of recovered materials.
  - i) Ensure proper safety measures for the workers involved in the day-to-day operations for the execution of legacy waste project.
  - j) All the workers involved should be cover under ESIC, Health check-ups and other beneficiary schemes as applicable from time to time.
- 5) Bidder should provide sufficient machineries / equipment to clear the dumpsite as per the timelines mentioned in this tender document and proposed by the Bidder in its Work Plan.
- 6) All the activities for landfill remediation through shall be in complete adherence to the rules and regulation mentioned in SWM Rules 2016, CPCB Guidelines on Legacy Waste - 2019, directions from Hon'ble NGT and Uttarakhand Pollution Control Board and all other applicable rules and regulations and their amendments from time to time.
- 7) The Bidder shall conduct a detailed survey (Drone survey or Total Station Contour Survey, baseline study or any other form of survey as per site conditions) of complete project site, including area earmarked in which dumpsite mining is to be done. The survey shall be done at the time of possession of the site as well as at every three months of interval, till the end of the bio-mining works as well as when asked by the Authority during. The output of the survey shall be shared with the Authority and volume of reclaimed portion or waste reduction shall be clearly presented in the drawing.
- 8) Anything of historical, anthropological, geological, or other interest or of significant value unexpectedly discovered on the Site is the property of Authority. The Bidder is to notify the Authority of such discoveries and conduct the Authority's instructions for dealing with them.


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- 9) The Bidder shall ensure that material which is to be transported for sale or disposal after scientific processing is not dumped at Authority Dumping Ground. The Bidder shall have to make necessary arrangement like fencing, or any other suitable arrangement as directed by Authority authorities to prevent such events.
- 10) The Bidder shall channelize of the recovered/excavated material from the legacy waste to the identified vendors/parties and disposal of inert/rejects as per CPCB Guidelines, **without stacking them at site for more than 30 days.**
- 11) The rubbles or stones bigger in size (size bigger than 250mm) shall not be carried for processing; it shall be stacked separately at dumping site. No payment for their stones/rubbles shall be included in the processing fees to be paid to Bidder.
- 12) Responsibility of Packing, storing, stacking, selling, diverting for recycling, marketing, and recycling of all useful material within 15 days of segregation, at own cost, shall be the responsibility if the Bidder.
- 13) The revenue or the income from the sale of the segregated useful material such as reusable and recyclable, Compost, Soil conditioner, raw RDF, C&D, Soil or any other by- product materials shall go to the Bidders account, if the Bidder will arrange the disposal at its own.
- 14) In case of disposal of any inert/reject fraction in low-lying area or disposal of recovered soil/ bio-soil /soil enricher, the Bidder, at its own cost, will conduct a lab testing of such materials from an NABL accredited lab and MoEFCC recognized laboratory to check its TCLP characteristics or any other parameters as recommended by the Engineer-in- charge or applicable rules/guidelines. The Bidder shall submit the report of the same to the Authority.
- 15) The Bidder shall be responsible for the payment towards fleet management to dispose all the material recovered from the legacy waste.
- 16) The Bidder shall ensure to maximize the recovery of products such as RDF, C&D fraction, compost/soil enricher/bio -soil/soil, etc. and minimize the inert/rejects from the waste.
- 17) The Bidder shall reclaim at least 8 hectares of land to its original form and take necessary step to remediate the soil, if at all any contamination is found in it.
- 18) The Bidder shall submit necessary supporting documents, to ensure the safe disposal of the excavated material, to the Corporation on quarterly basis, as described above in (para. - 1.3.6. - 16).

  
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#### 1.4. General Roles & Responsibilities of the Bidder:

Other roles and responsibilities of the Bidder for execution of above-mentioned scope of work shall be:


##### 1.4.1. Record keeping and Reporting:

- 1) The Bidder shall maintain a record of the daily processed legacy waste and fresh waste measured in the Weigh Bridge. The Bidder shall also keep proper record of all recovered and disposed of material. The Bidder shall prepare all periodical reports, applicable to the Projects, as may be required by Authority, other stakeholders, or the State Government etc.
- 2) The Bidders should set up of a weighbridge of 50 Ton's load bearing capacity or any other suitable system for weighing as approved by NAGAR NIGAM DEHRADUN for measurement of legacy waste and fresh waste during processing. This weighing system shall be fully online electronic, automatic system equipped with the latest technology along with backup server facility with IOT solution and dashboard display at office of Municipal Commissioner.
- 3) Data of weighing system shall be maintained properly for the entire contract period with backup facility and shall be provided as & when required by Authority officials and other competent authorities.
- 4) The weighbridge shall be fully online electronic, automatic system equipped with the latest technology along with backup server facility. Data of weighing system shall be maintained properly for the entire contract period with backup server facility and shall be provided as & when required by Authority officials and competent authorities.
- 5) The weighbridge shall be operated in CCTV surveillance with data storage of entire contract period. For CCTV surveillance High-Definition IP based cameras in adequate numbers (as directed by Authority) shall be provided by the Bidder.
- 6) CCTV Recordings of operation of weighing system shall be provided as and when required by Authority officials and competent authorities.
- 7) Any malfunctioning in operation of weighing system shall be the responsibility of the Bidder.
- 8) In case any malfunction/technical problem in the functioning of weighing system, the same shall be rectified by the Bidder within period of 24 hrs. During this period of failure, weighing of SW shall be conducted at private weighbridge located outside, which shall be approved by Authority at the Bidder's cost and no additional charges shall be paid by Authority.
- 9) The bidder shall submit an operational plan of shifts avoiding late-night operations of the plant, keeping in view that there should not be any objection from the nearby residence.

  
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**1.4.2. Routine Maintenance Standards:**

- 1) To ensure smooth and uninterrupted operations, routine maintenance of the facilities shall include, but not be limited to:
- 2) Prompt repairs of the storage and waste drying places, Leachate collection drainage and treatment system, electrical items, drains, vehicular passages, sieving machineries, lighting, and fencing,
- 3) Replacement of equipment/consumables, horticultural maintenance and repairs to equipment, structures and other civil works which are part of the waste processing facility.
- 4) Maintaining the shape, scope, full cross-section of the storm water drainage system and Leachate collection and drainage system; maintain stock spare parts for the machinery.
- 5) Keeping the waste processing facility in a clean, tidy, and orderly condition and taking all practical measures to prevent damage to the facility or any other property on or near the site.
- 6) Undertaking maintenance works in accordance with the O&M Plan and Operations Protocol.
- 7) Preventing, with the assistance of law enforcement agencies, where necessary, any unauthorized entry to and exit from and any encroachments including any encroachments on the site.
- 8) Monitoring system for air quality standard at the point of outlet should be maintained twice a week and the report should be made available as and when required by Authority or any other regulatory authority.
- 9) Suitable treatment process should be maintained inside the leachate treatment plant before discharging the wastewater for horticulture.
- 10) No work at night shall be done. Special permission shall be taken beforehand from the appropriate authority if needed.
- 11) All the vehicles to be used by the Bidder in and outside the plant shall strictly follow latest emission standard. As per the latest emission standard permissible by CPCB, MoEFCC.
- 12) The site shall be made available for inspection at any time as and when felt necessary by the Authorities.
- 13) All the materials to be used for construction/maintenance shall be of ISI mark.

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- 14) Suitable firefighting arrangement shall be made as per prevailing norms and standards laid down by the Govt. One Water Tanker of 5000 Litre Capacity shall be kept ready 24 X 7 for Fire Fighting.
- 15) There shall be a monitoring system at the entry, exit and weigh bridge from ULB/Corporation end. The monitoring system may be manual/mechanized round the clock.



#### 1.4.3. Quality Control:


- 1) **Identifying defects:** Authority shall check the Bidder's work and notify the Bidder of any Defects that are found such checking shall not affect the Bidder's responsibilities.
- 2) **Rectifying defects** Authority may instruct the Bidder to search for a Defect and to uncover and evaluate any work that the Employer considers may have a Defect.
- 3) **Tests:** If the Employer instructs the Bidder to conduct a test not specified in the Specification to check whether any work has a Defect and the test shows that it does, the Bidder shall pay for the test and any samples. If there is no Defect the test shall be a Compensation Event.
- 4) **Uncorrected defects:** If the Bidder has not corrected a Defect within the time specified by Authority, appropriate penalty must be paid by the Bidder.

#### 1.4.4. Emergency Response Plan:

- 1) The Emergency Response Plan ("ERP") shall be developed by the Bidder. This shall be a part of the Operations Protocol developed by the Bidder. The ERP shall set out steps to be taken and measures to be adopted by the Bidder in responding to dealing with Emergency including those situations related to personal injuries or fatalities, property damage and force majeure as follows:
- 2) In the event of an Emergency, the Bidder shall immediately conduct an inspection of the area affected by the Emergency. Where Emergency has necessitated closure of the Waste processing facility or part thereof, the Bidder shall promptly conduct any repair works necessary to restore the waste processing facilities to safe condition and in any event shall conduct such works before the affected area of the project facilities is re-opened to for normal operations.
- 3) The Bidder shall ensure that sufficient staff, plant, equipment, and materials, including without limitation medical assistance are available to always respond to Emergency within reasonable period during the Operations Period.

  
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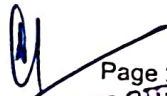
  
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**1.4.5. Environmental, Health & Safety measures:**

- 1) The bidder should use methods and processes to control foul odor and other such eco-friendly and non-polluting processes for minimizing the impact of the bio-mining activity in the adjacent areas of the dumpsite.
- 2) While carting out the waste excavation, the Bidder shall ensure the safety in terms of required slope during the waste cutting operations through JCB, Excavators, etc.
- 3) Create all facilities and decide for controlling the emission, pollution and contamination of the environment including but not limited to control of dust, particulate matter, odor, air quality, water quality and noise pollution.
- 4) The Bidder shall adhere to Health and Safety norms as per the industrial standards in the work area and the site premises.
- 5) The Bidder shall conduct the necessary testing of the Legacy waste recovered material, in terms of TCLP Tests, Elemental Analysis (Heavy Metals), etc. at regular basis (monthly interval) to ascertain the contamination in the waste, if any before disposal.
- 6) The Bidder must follow the Environmental Standards and Guidelines as mentioned below:
  - a) **Air Quality Monitoring:** As per Solid Waste Management Rules 2016 (SWM Rules 2016), National Ambient Air Quality Standards of India, 2009 or amendments thereafter with respect to baseline site parameters. The Bidder/ Contractor shall submit monthly reports of Air Quality Monitoring of minimum five location in and around the site
  - b) **Noise Monitoring:** As per Noise Pollution Rules 2000 or amendments thereafter with respect to baseline site parameters. The Bidder/ Contractor shall submit monthly reports of Noise Monitoring of minimum five location in and around the site
  - c) **Leachate Management Plan:** must be provided as part of legacy waste processing plant as per Solid Waste Management Rules 2016 (SWM Rules 2016) or amendments thereafter with respect to baseline site parameters. Leachate must be treated and discharged as per SWM Rules 2016 and applicable rules, regulations, guidelines and norms and their amendments from time to time. The Bidder/ Contractor shall submit monthly reports of Leachate Monitoring of minimum five location in and around the site.
  - d) **Odor Monitoring:** As per CPCB guidelines "Odor Pollution & Its Control (2008)" or Amendments thereafter with respect to baseline site parameters.
  - e) **Water Quality Monitoring:** As per Solid Waste Management Rules 2016 (SWM Rules 2016) or amendments thereafter with respect to baseline site

  
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parameters. The Bidder/ Contractor shall submit monthly reports of Water Quality Monitoring of minimum five locations in and around the site.

- f) **Aggregate Disposal-** As per Solid Waste Management Rules 2016 (SWM Rules 2016) or amendments thereafter with respect to baseline site parameters.
- g) Guidelines for disposal of legacy waste (old municipal solid waste) by the CPCB, February 2019.
- 7) The Bidder must make all the necessary arrangement to monitor and comply all environmental standards.
- 8) The Bidder shall also conduct monthly checks of the Ground water quality and submit the report to the Authority from time to time.
- 9) The Bidder shall segregate any Hazardous waste [as defined in Hazardous and other waste (Management and Trans- Boundary movement) Rules 2016 existing inside the site and separately earmarked. Authority shall dispose of the same at MPCB's approved sites in accordance with Hazardous and other waste (Management and Trans- Boundary movement) Rules 2016 or amendments thereafter.
- 10) It is the sole responsibility of the Bidder to abate the odor and fire nuisance on site. The Bidder must use enzyme/herbal based products which shall help to abate the odor and fly's nuisance. Necessary fire fighting vehicles shall be arranged to abate the fire nuisance.
- 11) Necessary safety gears shall be provided by the Bidder to all staff working as per the good industry practice.
- 12) The aspects relating to employee and worker safety, control mechanisms of litter, pest, fire, surface runoffs etc., needs to be followed.
- 13) It is expected that e-waste, hazardous waste, and recyclables such as the plastic, glass, metal, etc. does not any way form the part of inert waste and shall be addressed as per the prevailing rules (MSW Rules 2016, CPCB guideline and relevant other statutory norm).
- 14) Plantation of adequate numbers should be done and maintain to reduce the noise and air pollution from the plant.
- 15) Taking all reasonable measures for the safety of all the workers, material, supplies, and equipment brought to the site. Explosives, if any, shall be stored, transported, and disposed of by the Concessionaire in accordance with Applicable Laws/ Permits.
- 16) For discharge of wastewater and foul-gas, emission standards to be followed strictly as per prevailing MPCB, CPCB, CPHEEO or any Govt. norms.

  
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- 17) After the land reclamation, the Bidder needs to conduct testing of the soil underneath the waste and if found contaminated, necessary soil treatment techniques need to be applied before handover of reclaimed land.
- 18) All environment monitoring tests of Ambient Air, Water, Wastewater, Leachate, Odor, Soil, Soil Enricher, RDF etc. should be done by Bidder/Contractor at his own cost through a NABL accredited and MoEFCC recognized laboratory only.
- 19) Baseline data of environment monitoring tests of Ambient Air, Water, Wastewater, Leachate, Odor, Soil etc. of minimum five fixed locations should be provided by Bidder/Contractor before commissioning / starting the plant operation to Authority / NND. The minimum five environment monitoring test's locations to be fixed by the Contractor and NND jointly based on applicable CPCB guidelines and norms through scientific approach such as windrow pattern, gravity flow, ground water flow etc.
- 20) During rainy season, the exposed area of the excavated legacy waste material, windrows under stabilization to be kept minimum possible to reduce formation of new leachate. The exposed area of the excavated legacy waste material, windrows under stabilization to be covered with tarpaulin during rainy season to reduce formation of new leachate.

#### 1.5. Obligation of Parties:

##### 1.5.1. Obligations of Bidder

- 1) The Bidder shall ensure that all the aspects of project and process employed, for executing the scope of work thereof, shall conform with the specification and directions given in existing laws pertaining to dumpsite management, such as SWM rules 2016, guidelines from regulatory agencies like CPCB, DPCC, etc. and suggestions from NGT.
- 2) The Bidder shall provide a detailed plan of action for conducting the entire project work, considering the scope and timelines, mentioned in the RFP. The Bidder shall also make necessary modifications/changes in the work plan, based on the site conditions, or as recommended by Authority and finalize it as per the approval by the Authority, prior to the signing of Contract. The Bidder shall ensure that each milestone should be achieved within proposed timelines.
- 3) Prior to the start of project operations, the Bidder shall be responsible for obtaining all the applicable statutory clearances, permission, licenses, consents, and authorizations necessary for the Project at their own cost. The Authority shall provide the assistance, wherever required.
- 4) Site preparation, mobilization, workforce deployment, installation of machinery, etc. and construction/creation of other allied facilities shall be completed within 3 months from the signing of the Contract Agreement. Post 90 days, the reclamation of the sites shall be done within 15 months.

  
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- 5) The Bidder shall conduct its own due diligence for site investigation, analyzing the characteristics, composition, and quantum of the waste at the Project site or any other study required for the execution of the work, before taking due approval of the Authority.
- 6) All the cost related to these operations, including electrical, water consumption and other utility charges, and required field arrangements, workforce deployment shall have to bear by the Bidder only.
- 7) Creation and maintenance of infrastructure, facilities and amenities for waste excavated, storage and disposal, shall be at Bidder's risk and cost. Providing security arrangement for the plan project site, machineries, equipment etc. shall be in the scope of the Bidder/Contractor.
- 8) Construction of office room (minimum 2 Nos. of 200 Sq.Ft.) facilities for the Project with arrangement for water supply, Water Closet (WC), Drinking Water, Pantry, and power supply at the site. Authority may assist in providing single point connection for electricity requirements from its existing power station near Danda Lakhaund, Dehradun site. However, the cost of usage shall be paid by the Bidder as per actuals based on appropriate meter readings from the meters installed.
- 9) It is the sole responsibility of the Bidder to dispose of the rejects/inert, C&D material, etc. generated during the process. By products from such processing viz. recyclables, compost/soil- enricher, RDF, etc. and related revenues (if any) shall be the property of the Bidder.
- 10) The Bidder shall not be permitted to use the municipal land at any point of time of contract to mortgage (or) to be used as a security for mobilizing finance for this purpose (or) any other purpose. Bidder can use the land for the purpose of this project only till contract period or termination of contract.
- 11) The Bidder shall abide with the provision of Minimum Wages Act/Workman Compensation Act and such other statutory obligations notified by the concerned Govt. departments, from time to time. It should be specifically noted that the Bidder shall have to get them registered with the relevant authorities as required under various labor laws and submit undertaking of compliance along with the first payment bill failing which the payment bill shall not be processed.
- 12) The Bidder shall strictly comply with all the statutory requirements notified by the concerned Govt. departments from time to time and indemnify the Corporation against any claim(s), whatsoever arising therefrom and the tenderer shall be solely responsible for consequences thereof. The Bidder are requested to take cognizance of Child Labor Act and take precaution not to deploy child Labor. If Child Labor is found to be deployed on the work, necessary action as deemed fit will be taken.
- 13) Submission of progress report to Authority on monthly and quarterly basis. The monthly and quarterly reports shall be submitted within 7 (seven) days of

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the subsequent month and quarter respectively. Also, submit the daily report of waste taken for remediation in Metric tons on daily basis.

- 14) After completion of contract period (extended period as the case may be), within 3 months, the bidder must remove any plant, machineries, equipment from the site, which shall not be linked to the future operations of Engineered Landfill and LTP. The Bidder shall hand over all the assets, including building, machineries, and related ancillaries to the Authority after end of Contract period.
- 15) **Taxes and Duties:** The Service Provider, Subcontractors, and their Personnel shall pay such taxes, duties, fees, and other impositions as may be levied under the Applicable Law, the amount of which is deemed to have been included in the Contract Price.
- 16) The Services shall be performed at such locations as are specified in PIM: Annexure 1, and, where the location of a particular task is not so specified, at such locations, whether in the Government's country or elsewhere, as the Authority may approve.
- 17) **Confidentiality:** The Bidder and the Personnel of either of them shall not, either during the term or within two (2) years after the expiration of this Contract, disclose any proprietary or confidential information relating to the Project, the Services, this Contract, or the Authority's business or operations without the prior written consent of the Authority.
- 18) **Protection of the Environment**

As applicable, the Service Provider shall take all necessary measures to:

- a) To protect the environment (both on and off the locations where the Services are executed) from damages resulting from its operations/and or activities; and
- b) To limit damage and nuisance to people and property resulting from pollution, noise, and other results of the Service Provider's operations and/or activities.
- c) The Service Provider shall ensure that any emissions, surface discharges, effluent and any other pollutants from its activities shall exceed neither the values that may be indicated in the Authority's Requirements, nor those prescribed by applicable laws.
- d) In the event of damage to the environment, property and/or nuisance to people, on or off the locations where the Services are carried out, as a result of the Service Provider's operations and/or activities, the Service Provider shall agree with the Authority the appropriate actions and time scale to remedy, as practicable, the damaged environment to its former condition. The Service Provider shall implement such remedies at its cost to the satisfaction of the Authority.

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## 19) Cultural Heritage Findings

- a) All fossils, coins, articles of value or antiquity, structures, groups of structures, and other remains or items of geological, archaeological, paleontological, historical, architectural, religious interest found on the locations in the Authority's country where the Services are carried out shall be placed under the care and custody of the Authority.
- b) As soon as practicable after discovery of any such finding, the Service Provider shall give a notice to the Authority, to give the Authority the opportunity to promptly inspect and/or investigate the finding before it is disturbed and to issue instructions for dealing with it.

## 20) Description of Personnel

The Bidder shall provide the details of its personnel's to be deployed such as titles, agreed job descriptions, minimum qualifications, and estimated periods of engagement in the carrying out of the Services.

### 1.5.2. Obligations of Authority

- 1) Authority shall handover the Landfill Site area to the Bidder, as per the earmarked land parcel jointly approved by the Authority and the Bidder, to set up machinery and take activities for processing and segregation of excavated material.
- 2) Authority would hand over possession of the site/s to the Bidder, irrespective of the title of the land to enable him to conduct activities required for executing the scope of work.
- 3) Authority may facilitate all forms of support to the Successful bidder for obtaining certification/ statutory clearances and provide single point connection for water, electricity, and other utility services (if required).
- 4) Authority shall provide electricity connection (Single Point) at its existing power station near to Danda Lakhaund site. Other utility connections shall be arranged by the Bidders and all the utilization charges/bills shall be paid by Bidder.
- 5) Authority shall facilitate to get the electricity and water connections on the project site however, the successful bidder shall pay the connection charges and monthly electricity and water tariffs.
- 6) Authority shall facilitate for safely transporting machineries passing through the narrow pathway at the project location

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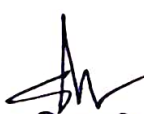
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### 1.6. Structure of the Bid Document:

The Bid Document is structured in the following manner with sufficient information:


- 1) Request for Proposal (RFP)
- 2) Introduction
- 3) Instruction to Bidders
- 4) Preparation of Bids
- 5) Submission of Bids
- 6) Technical and Financial Bid Evaluation
- 7) Fraud and Corrupt Practices
- 8) Payment Schedule
- 9) Force Majeure
- 10) Termination
- 11) Dispute Resolution
- 12) Miscellaneous
- 13) Forms for Bid Submission
- 14) Project Information Memorandum

  
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## 2. INSTRUCTION TO BIDDER


### 2.1. Scope of Bid:


The Authority invites bids for the execution of works (herein after referred to as "the Works") detailed in this Bid Document. The successful bidder will be expected to complete the works by the intended completion date specified in the section "Scope of Work" of this RFP document.

### 2.2. Checklist of documents as Pre-qualification Criteria for Eligible Bidder

Sr. No.	Criteria	Document required
1.	The Bidder shall be a Public Company, Private Company and LLPs registered under the Indian Companies Act 1956/2013 or a company incorporated under equivalent law in India or abroad and operating from <b>at-least last five (05) complete Financial Years</b>	<b>Copy of Certificate of Incorporation.</b> The Bidder shall be required to provide a True copy of its Registered Certificate
2.	The Bidder must have a valid GST Certificate and EPF registration.	The Bidder shall be required to provide: — <b>Copy of GST Certificate</b> — <b>Copy of EPF Registration</b> <b>The Bidder must have a valid GST certificate. Also, the bidder shall ensure the employee benefit compliance in accordance with law either deployed on bidder's payroll or third-party engagement Certificate</b>
3.	In case of sole proprietorship	Bidder needs to submit Certificate of Enlistment
4.	In case of foreign companies	Foreign companies - 100% wholly owned subsidiary incorporated in India, in accordance with India Companies Act, 2013, may participate. In this case, a Parent company/subsidiary guarantee is required. However, in case of such companies, the bid documents including registration, certificate of incorporation, eligibility documents, experience letters, etc. related to overseas and/or scripted in language other than English, need to be translated in to English Language. Further, all the documents need to be legalized / vetted /

  
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		authenticate by Indian embassy of that country.
5.	Power of Attorney for mentioning authorized signatories	A notarized Power of Attorney issued on Non-Judicial Paper (Form 3). OR A company Board Resolution mentioning the names of the authorized signatories.
6.	<b>Technical Experience (Technical Capacity) in last 5 years:</b>	
	<p><b>CRITERIA I:</b></p> <p><b>SUCCESSFUL PROJECT DELIVERY:</b></p> <p>The bidder should have experience in completion of similar work, of at least <b>Two (02) completed projects</b> in last Five Financial years in Government/ Urban Local Bodies in India with a population of more than 10 lakhs.</p> <p>(The necessary client certificate shall be enclosed for claiming the experience failing which the bid will be rejected).</p>	<p>As proof of Experience, the bidder firm shall provide the following documentary proof duly attested by the concerned statutory authority or client by an officer not below the rank of Executive Engineer/Project Manager or equivalent.</p> <p>Copy of work order mentioning the details of the contract price, capacity of the project and nature of work duly attested by issuing authority on its letter head.</p> <p>Completion certificate or Performance certificate (in case of ongoing projects) clearly stating the capacity of the project and quantity processed/executed till date (in % or actuals) in case of currently running projects including performance of the firm for the work completed during the contract period of the project in respect of the projects whose experience is claimed.</p>
6.2	<p><b>CRITERIA II:</b></p> <p><b>SUCCESSFUL COMPLETION: QUANTITY</b></p> <p>The bidder should have completed similar work during the last five years prior to the due date of this bid submission in any Government/Urban Local Bodies in India of following capacities:</p> <p><b>One (1) similar project of minimum 4 Lakh Ton of Legacy Waste.</b></p> <p><i>Note: Criteria II experience in trommel rental models will not be considered.</i></p>	<p>Proof of such engagement shall be provided in the form of the client's Letter of Award along with Completion Certificate. Part completion certificates/ Provisional Completion Certificates will also be accepted provided the Letter of Award is also attached clearly outlining the total order quantity or Project Value. Bidder shall also provide details of Scope of Work / Terms of Reference (ToR), date of start and completion/expected completion of assignment.</p> <p>Bids without requisite Credentials Certificates shall not be considered for evaluation.</p> <p>Bidder must submit the Credentials of only those projects, in which he had worked or is engaged (in case of ongoing projects) as primary or key-contractor. Any certificate</p>
6.3	<p><b>CRITERIA III:</b></p> <p><b>SUCCESSFUL DISPOSAL OF RDF:</b></p> <p>Bidder should have responsibly disposed Refuse Derived Fuel (RDF) to the quantity equivalent to at least <b>60,000 MT / Cubic Meter</b> from the eligible similar work as used in the Criteria II of the eligibility criteria; to Cement plants/ Waste to Energy (WTE) plants / any other industries.</p>	<p>Bids without requisite Credentials Certificates shall not be considered for evaluation.</p> <p>Bidder must submit the Credentials of only those projects, in which he had worked or is engaged (in case of ongoing projects) as primary or key-contractor. Any certificate</p>



	<p><b>RDF SUPPLY PROOF TO BE ENCLOSED:</b> Co-processing certificates issued by the consumer with unique reference number for verification along with Certificates issued by the Urban or Local Bodies confirming the same, signed by officer above or equal to the rank of Executive Engineer.</p>	<p>submitted by the Bidder, working as sub-contractor, shall not be considered for evaluation.</p> <p>If the projects have been executed as Consortium/JV then proper legal documents should be submitted mentioning the bidder was a partner of the venture, his % share and not a sub-bidder.</p>
6.4	<p><b>CRITERIA IV:</b> <b>SUCCESSFUL DISPOSAL OF BIOSOIL/INERT:</b> Bidder should have responsibly disposed Bio-soil/Inert to the quantity equivalent to at least 1,50,000 MT quantity from the eligible similar work as used in the Criteria II of the eligibility criteria; to low-lying areas/greenery etc. A letter from the Urban Local Body signed by an officer not below the rank of Executive Engineer clearly indicating the quantity of Bio-soil/Inert disposed from the said project must be attached.</p>	<p>Proof in the form of photographs/ contour maps/ drone map/image to be provided to prove land reclamation in the eligible experience projects. Similar work mentioned in the Qualification Criteria above should have been constructed and operated in conformity with the SWM Rules 2016 and CPCB Guidelines 2019 for Disposal of Legacy Waste, in last Five (5) years.</p> <p><u>Note :</u> <u>Similar works would mean Bioremediation / Bio-mining of legacy waste including disposal of excavated waste, recovered material and aggregates generated in dumpsite/landfill</u></p>
7.	<b>Financial Experience (Financial Capacity):</b>	
7.1	<p><b>Turnover:</b> Bidder must have an average annual financial turnover of INR 20 (Twenty) Crores or more during last 5 (Five) financial years start from 2018-19 ending on 2022-23.</p>	<p>The bidder must upload attested copies audited balance sheets for the Financial Years 2018-19, 2019-20, 2020-21, 2021-22 &amp; 2022-2023 along with turnover certificate issued by Statutory Auditor.</p> <p>In case of audited balance sheet of Financial Year 2022-23 is not available, provisional Certificate authorized by an Auditor shall be submitted).</p>
7.2	<p><b>Positive Net-Worth:</b> The Bidder should have a Positive Net-Worth in the financial year (i.e., FY 2022-23)</p>	<p>Bidder must upload attested copy of certificate from statutory auditor specifying the net-worth of the Applicant of the preceding Financial Year (FY) i.e., for FY 2022-23 (In case if not available for the FY 2022-23, Provisional Certificate authorized by an Auditor shall be submitted).</p>

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8.	The bidder should not be blacklisted/ debarred/ terminated of contract by any Government/ ULBs/Government Board/ Corporation Company/ Statutory Board/ PSU company/ Non- Government/ Government of any sovereign countries/ Private agencies and Funding agencies in the last 3 years.	An undertaking on Non-Judicial Stamp Paper stating the same, dated on or after the 'RFP Download Start Date (Online),' must be submitted, stating the Bidder is Not Blacklisted, debarred, or terminated due to unsatisfactory performance or Bankruptcy. Refer FORM 12.
9.	Valid Scanned Copies of the statutory documents.	Trade License/Certificate of Enlistment, PAN Card, Professional Tax Registration Certificate and Goods and Service Tax (GST) registration certificate mentioning the 15-digit Goods and Service Taxpayer Identification Number under the GST Act 2017 Income Tax Return Certificate for the Financial Years (FY 2018-19,2019-20,2020-21, FY2021-22, and FY 2022-23)
10.	The bidder should have a Registered Office in India	Documentary Proof of having a registered office in India.
11.	Covering Letter as per format	Duly signed FORM 1.
<p><b>Note-1:</b> In Case any document is not required in any state, the bidder should provide an undertaking on its company letterhead duly signed by the authorized signatories mentioning it is not applicable in that state for its business.</p> <p><b>Note-2:</b> The bidder should be technically capable enough to ensure all environmental hazard mitigation measures and demonstrate expertise in EHS – Environmental, Health and Safety aspects and impacts that needed to be addressed at dumpsite while adopting the works. <b>The bidder shall ensure all Environmental, and Health and Safety norms are fulfilled to mitigate the environmental hazardous. The required approvals shall be taken from the appropriate authorities for the same by the bidder.</b></p>		

### 2.3. Qualifying Criteria

The Applicant's competence and capability is proposed to be operated by the following parameters:

Sr.	Parameters	Requirement	Proof to be Enclosed	Max. Marks
1	Profile of the organization	Bidder must have an average annual financial turnover of INR 20 (Twenty) Crores or more.	a) Certificate(s) from statutory auditors. b) Audited financial statements for	10
		Turn Over	marks	

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		Min. 20 Cr-30 Crores	05	the last three financial years.	
		Above 30 Crores	10		
2	Experience - 1	The Applicant/ Lead Member shall have scientifically reclaimed more than 400,000 MT of Municipal Solid Waste during last 5 years before date of publication of the tender in any Government/ Semi-government/ PSU only in India or abroad.		Experience Certificate from the Urban or Local Body where the work has been executed clearly mentioning the quantity of MSW processed.  For Foreign Bidders, Certificate from Notary (of the foreign country) and duly legalized by the Indian embassy abroad.  Alternatively, for countries that have signed the Hague Legislation Convention 1961 a confirming Apostille Certificate may be obtained.	25
		<b>Quantity</b>	<b>Marks</b>		
		One project of Min 400000 MT	10		
		One project of 400001 MT- 500000 MT	15		
		One project of 500001 MT- 600000 MT	20		
		One project of 600001 and above.	25		
3.	Experience -2	Maximum reclamation of dumpsite land from legacy waste:		ULB's certificate is required to claim the % achieved criteria. (Duly signed, dated, and stamped)	20
		<b>Required</b>	<b>Marks</b>		
		31%-60%	10		
		61%-90%	15		
		91%-100	20		
4.	Experience - 3	Successful completion of two or more projects during last 5 years.		Completion certificate from Urban local body /municipal corporation where the work has been executed.	15
		<b>Required</b>	<b>Marks</b>		
		≥ 5 projects	15		
		3 - 4 projects	10		
		2 - projects	05		
5.	Technology	The details of the proposed technology, process, equipment, SWM flow chart, expected end into useful end product and action plan for product, marketing the end product.		The proposed technology should be installed and operative in a successful manner in any one of the Urban or Local Bodies anywhere in India.	20
6.	Approach & Methodology	Methodology to be adopted: <ul style="list-style-type: none"> <li>Plan for Design and installation of various machineries installed.</li> <li>Proposed manpower deployment to achieve the targeted quantity processing.</li> <li>Duties and responsibilities to be assigned to operator/ ULB.</li> <li>Action plan for routine DBOO and break down maintenance.</li> </ul>			10

*Note: The bidder who scores minimum 70 marks will be qualified for opening the financial bid.*

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अपर नगर आयुक्त  
नगर निगम, देहरादून

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## 2.4. Other Criteria

- 1) "A parent company is company that owns 100% of the outstanding voting stock in another company (second company) and controls management and operation of the second company by influencing or electing its board of directors; the second company being deemed a subsidiary of the parent company". Under the definition of a 'parent company,' a bidder that is a subsidiary can have only one Parent Company. 'Bidders' using the contractual experience of the Parent Company or Subsidiaries must satisfy the criteria stated below for the Parent Company or Subsidiary. A failure to meet this criterion shall result in rejection of the bid. A failure to furnish the Parent Company Guarantee (FORM 10) or the Subsidiary Company Guarantee(s) (FORM 11) as appropriate, shall result in the rejection of the tender.
- 2) Copies of the Work Order/ Agreement/ Contract Copy and Work Completion Certificates / Experience Certificate between the participating bidder and the client, as mentioned in the Section 5.1, must be submitted to fulfil the eligibility criterion.
- 3) The Bidder should have their well-established office within Dehradun City. However, if the bidder is not Dehradun based and they happen to succeed in the bid, then they should open such office within 2 months of the receipt of the LOA/ work order.

## 2.5. Technical Capacity

For demonstrating technical capacity ("the technical capacity"), the bidder must comply with all the following conditions:

Should have managed, during preceding five (5) financial years prior to the due date of this bid submission, following works:

In case an eligible project for assessing "the technical capacity" has been jointly executed by the Bidder (as part of a Consortium/JV) in the past, then the entity claiming such eligibility should satisfy both of below conditions:

- 1) Have held minimum 51% share in the project for which the experience is being claimed. The claiming entity shall produce proof of percentage shareholding in the project for which experience is being claimed.
- 2) The project shall be qualified as 'eligible project' for "the technical capacity" only if the percentage shareholding in the project multiplied with the total project capacity is satisfying the criteria laid down in pre-qualification criteria.
- 3) The eligible projects claiming "the Technical Capacity" should have been awarded by any Urban Local Body/ any Government / Semi-Government Organizations / Public Sector Undertakings in India with direct contract with them. For completed projects, completion certificate from the ULB, signed by executive engineer shall be submitted along with the bid.

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- 4) For ongoing projects, the payment certificate or running bills (with mentioned of quantity), duly certified by an official not below the grade of executive engineer/ finance officer, should be furnished.

## 2.6. Financial Capacity

For the purposes defining the Net Worth, the net worth (the "Net Worth") shall mean the aggregate value of the paid-up share capital and all reserves created out of the profits and securities premium account, after deducting the aggregate value of the accumulated losses, deferred expenditure and miscellaneous expenditure not written off, as per the audited balance sheet, but does not include reserves created out of revaluation of assets, write back of depreciation and amalgamation. In case the Bidder is a trust or a society, Net Worth will mean the sum of available corpus and reserves.

## 2.7. One bid per Bidder

A Bidder is eligible to submit only one Bid for the Project in entire bidding process. Applicant/Bidder shall not be entitled to submit another bid.

## 2.8. Cost of Bidding

The Bidders shall be responsible for all the costs associated with the preparation of their Bids and their participation in the Bidding Process. The Authority will not be responsible or in any way liable for such costs, regardless of the conduct or outcome of the Bidding Process.

## 2.9. Site Visit and Verification of Information

Prior to submitting the Proposal, the Bidders are advised to visit and examine the project site and its surroundings, obtain, and ascertain for themselves all technical data, and other information necessary for preparing their Proposal (bid) including conducting necessary technical surveys, field investigations, assets condition assessment etc. at its own cost and risk. Bidders are encouraged to submit their respective Bids after visiting the Project site/area to ascertain the ground situation, coverage, quality of assets or any other matter considered relevant by them.

- a) The Bidders shall be deemed to have full knowledge of the site conditions, whether physically inspected or not, if Bidder submits a Proposal for this project. It is advised that the bidder visit the dumpsite in order to have full knowledge of the current conditions of the site to be remediated under this project. NND shall consider that the bidder has personally visited the project site if the bidder submits a proposal for this project.
- b) For the above purpose, the Bidders may approach the Authority for assistance during any site visit. The Bidders shall be responsible for all arrangements and shall release and indemnify the Authority and/or any of its agencies/consultants/advisors from and against all liability in respect here of and shall be solely responsible for any personal injury, loss of or damage to property or any other loss, damage, costs, or expenses, however

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caused, which, but for the exercise of such permission, would not have arisen due to this RFP.

c) It shall be deemed that by submitting a Bid, the Bidder has:

- Made a complete and careful examination of the Bidding Documents.
- Received all relevant information.
- Acknowledged and accepted the risk of inadequacy, error or mistake in the information provided in the Bidding Documents or furnished by the Authority and shall not be a basis for any claim for compensation, damages, extension of time of performance of its obligations, loss of profit etc. from the Authority, or a ground for termination of the Contract Agreement.
- Satisfied itself about all matters, things, and information necessary and required for submitting an informed Bid, execution of the Project in accordance with the Bidding Documents and performance of all its obligations there under.

#### 2.10. Pre-Bid meeting

- 1) The bidders or their official representatives are invited to attend a pre-bid meeting. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage. The date, time and address of the Pre-bid meeting shall be as specified in the bid data sheet in this RFP.
- 2) Bidders requiring any clarification on the bidding documents or questions on any matter that may be raised at that stage, may send their queries in written, addressed to contact person as mentioned in the Bid Data Sheet, latest by date and time mentioned in the bid data sheet. The responses of the Authority will be uploaded only on the Website <https://www.uktenders.gov.in> shall not be communicated separately to the bidders.
- 3) The Authority shall endeavor to respond to the questions raised or clarifications sought by the Bidders. However, the Authority reserves the right not to respond to any question or provide any clarification, in its sole discretion, and nothing in this Clause shall be taken or read as compelling or requiring the Authority to respond to any question or to provide any clarification which will have material adverse effect on the bidding outcome.
- 4) The Authority may also on its own motion, if deemed necessary, issue interpretations and clarifications to all Bidders. All clarifications and interpretations issued by the Authority shall be deemed to be part of the Bidding Documents. Verbal clarifications and information given by Authority, or its employees or representatives shall not in any way or manner be binding on the Authority.

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## 2.11. Amondment In the Bidding Document

- 1) At any time prior to the deadline for submission of proposals, the Authority may amend the RFP documents, including any contractual document, by issuing an Addendum.
- 2) Any Addendum thus issued shall be part of the RFP documents and shall be published on the website www.uktenders.gov.in. Authority may communicate in writing by mail or by fax to all short-listed Bidders to whom the RFP documents are issued.
- 3) The Authority bears no obligation for any bidder not receiving the information of the addendum issued to this RFP for any reason whatsoever.

## 2.12. Conflict of Interest

A Bidder shall not have the conflict of interest (the "Conflict of Interest") that affects the Bidding Process. Any Bidder found to have a Conflict of Interest shall be disqualified. In the event of disqualification, the Authority shall forfeit and appropriate the EMD or Performance Security (the 5% of Contract Value will be the value of performance security), as the case may be. Without limiting the generality of the above, a Bidder shall be considered to have a 'conflict of interest' that affects the 'Bidding Process,' if:

- 1) Such Bidder (or any constituent thereof) and any other Bidder (or any constituent thereof) have common controlling shareholders or other ownership interest.

OR

- 2) A constituent of such Bidder is also a constituent of another Bidder.

OR


- 3) Such Bidder receives or has received any direct or indirect subsidy from any other Bidder or has provided any such subsidy to any other Bidder.


OR


- 4) Such Bidder has the same legal representative for purposes of this Bid as any other Bidder.

OR

- 5) Such Bidder has a relationship with another Bidder, directly or through common third parties, which puts them in a position to have access to each other's information about, or to influence the Bid of either or each of the other Bidder.

  
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Scientific Dumpsite Remediation of Legacy Waste and Land Reclamation through  
Bio-mining, Resource Recovery and Rejects Disposal at Danda Lakhaund site, Dehradun

A Bidder shall be liable for disqualification and forfeiture of EMD or Performance Security and termination of contract, if a conflict of interest on part of Bidder is discovered by the Authority (i) during the Bidding Process, or (ii) after the issue of letter of award (LoA) (To be awarded within 10 days of opening of the Financial Bid) or (iii) after the execution of the Contract Agreement.

  
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### 3. PREPARATION OF BIDS

#### 3.1. Preparation and Submission of Bids

The bidders must prepare their bid online, encrypt their bid data in the Bid forms and submit Bid of all the envelopes and documents related to the Bid required to be uploaded as per the time schedule mentioned in the key dates provided in this RFP document dafter singing of the same by the Digital Signature of their authorized representatives. One Hard copy / Physical copy of only technical bid shall be submitted as per schedule mentioned in this RFP document.

Note:

- Bidders are requested to visit e-tendering website regularly for any clarifications and/or due date extension or corrigendum.
- Bidder must positively complete online e-tendering procedure.
- The Authority shall not be responsible in any way for delay/difficulties/ inaccessibility of the downloading facility from the website for any reason whatsoever.
- In case, due date for submission & opening of tender happens to be a holiday, the due date shall be shifted to the next working day for which no prior intimation will be given.
- The Authority reserves the right for extension of due date of opening of technical bid.

#### 3.2. Bid Validity Period


The bids shall remain valid for a period specified in the RFP from the due date of bidding as prescribed by the Authority. The validity of the bid can be extended by mutual consent in writing.


#### 3.3. Bid Document Fees

The Bid Document shall be available for download to concerned eligible bidders immediately after online release of the bids and up to scheduled time and date as set in Bid Data Sheet. The bid document can be downloaded free of cost; however, the bidders must pay Bid document fees, of the amount as mentioned in the bid data sheet in the form of **Demand Draft** in favor of **Senior Finance Officer, Nagar Nigam Dehradun**, valid for 6 months. The scanned copy of Tender fee shall be submitted with the e-tender along with original copies on or before the last submission date as mentioned in the bid data sheet of the RFP document, failing which the bid shall be deemed non-responsive.


#### 3.4. Earnest Money Deposit

The Bidder shall furnish, as part of the Bid, an Earnest Money Deposit (EMD) of the amount as mentioned in bid data sheet of the RFP document. EMD must be submitted by the Bidder **in the form of Demand Draft in favor of Senior Finance Officer, Nagar Nigam Dehradun, or Fixed Deposit Receipt (FDR) or Bank Guarantee (BG as per attached Form 13) valid for 3 months.** The scanned copy of EMD shall be submitted with the e-tender along with original copies on

  
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or before the last submission date, as mentioned in the bid data sheet of the RFP document, failing which the bid shall be deemed non-responsive.

- 1) All bidders shall pay EMD as specified above and there is no provision of exemption of EMD. No interest shall be payable on the EMD. The Bidder shall bear the cost relating to providing its EMD. Any Bid not accompanied by the EMD shall be rejected by the Authority as being non-responsive Bid.
- 2) The EMD of unsuccessful Bidders will be returned within 30 days of the date of finalization of successful Bidder or signing of the contract agreement with the successful bidder whichever is later. If the Bid is cancelled for any reason whatsoever, the EMD shall be returned to all the bidders within 30 days from the date of such cancellation.
- 3) The EMD of the successful Bidder will be retained by the Authority and returned after 30 days of signing of contract agreement and furnishing the performance guarantee by the successful bidder. The successful bidder shall ensure that its EMD remains valid during such period.
- 4) The EMD will be forfeited, if:
  - a) Any bidder withdraws its bid during the validity period of the Bid.
  - b) The successful Bidder fails to sign contract agreement or submit performance guarantee.
  - c) The Authority finds out that the bidder has involved in corrupt and fraudulent practice or has given any material misrepresentation in its bid knowingly or unknowingly.
  - d) Any other reason there of mentioned in this bid document.
  - e) The Bidders fails to comply with the Bid process.


### 3.5. Language of Bid

The bid and all related correspondence and documents shall be written in the English language. Supporting documents and printed literature furnished by the Eligible Bidder with the Proposal may be in any other language if they are accompanied by an appropriate translation into English. Supporting materials that are not translated into English shall not be considered. For interpretation and evaluation of the Proposal, the English language translation shall prevail.

  
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#### 4. SUBMISSION OF BIDS

##### 4.1. Online submission of Bids

The bidders must submit their respective bids online, as per the instructions provided on the e-tender website <https://www.uktenders.gov.in> online submission of bids. The bidders shall submit their Bids duly completed in all respect on or before the due date of bid submission after signing of the same by the Digital Signature of their authorized representatives. The Bid submitted online by the Bidder shall be in the following part:

— Part 1: Responsiveness and Technical Bid

— Part 2: Price Bid

##### 4.2. Bid Due Date

The due date and time of the bid submission and other relevant schedule is as mentioned below:

<b>Publishing of Tender Document</b>	....., 3:00 PM
<b>Pre-bid Queries to be submitted by</b>	....., 12:00 O'clock
Pre-bid Meeting / conference shall be in Meeting Hall, <b>NAGAR NIGAM DEHRADUN, 1 Patel Road, Dehradun (Uttarakhand) – 248001</b>	....., 12:00 O'clock
<b>Online Bid submission end date</b>	..... up to 3:00 PM .
<b>Bid Opening Date</b>	..... after 3:30 PM or any other suitable date and time decided by the authority.


**4.2.1.** The Authority may, in its sole discretion, extend the Bid Due Date by issuing an Addendum. While extending the Bid Due Date on account of an addendum, the Authority shall have due regard for the time required by Bidders to address the amendments specified therein. In the case of significant amendments, at least 15 (fifteen) days shall be provided between the date of amendment and the Bid Due Date, and in the case of minor amendments, at least 7 (seven) days shall be provided.

**4.2.2.** Authority will publish the Addendum on the website of <https://www.uktenders.gov.in>.

##### 4.3. Withdrawal, Substitution and Modification of Bids

Bidders can withdraw and modify their respective e-online submitted bids till the end of the due date of bid submission. The Bidder will not be able to modify a Bid after the due date of submission of this Bids. The bid for which withdrawal request has been received by the Authority after the due date of bidding shall be declined from the bidding process. In the event of withdrawal of a Bid by the Bidder, after the due date of its submission, the Authority reserves the right to forfeit the EMD of the bidder at its sole discretion.

  
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#### 4.4. Bid Submission

##### 4.4.1. Technical Bid Submission

The checklist of documents to be submitted as a part of technical proposal by the responsive bidders will be as per the following:

(Checklist of documents to be submitted for the responsiveness evaluation under Technical Bid)

- 1) This RFP document, with all pages signed by the Authorized Signatory.
- 2) Covering Letter (as per FORM 1)
- 3) General Information of the Bidder (as per FORM 2)
- 4) Power of Attorney or Company Board Resolution establishing the Authorized Signatory. (As per FORM 3)
- 5) Financial Capabilities of the Bidder (as per FORM 4)
- 6) Certificate of Incorporation.
- 7) Credentials of the Bidder along with relevant Work Orders, Agreements and Completion/Commissioning Certificates (as per FORMS 5 and FORM 6)
- 8) Undertaking on Non-Judicial Stamp Paper stating the Bidder is Not Blacklisted, Bankrupt and debarred for any unsatisfactory performance (as per FORM 12)
- 9) Valid Scanned copies of the following documents:
  - a) Trade License /Certificate of Enlistment
  - b) PAN Card
  - c) Professional Tax Registration Certificate
  - d) Goods and Service Tax (GST) registration certificate mentioning the 15-digit Goods and Service Taxpayer Identification Number under the GST Act 2017
  - e) EMD and Tender Fee as Demand Draft (DD)
- 10) Income Tax Return Certificate for the Financial Years 2018-19, 2019-20, 2020-21, 2021-22, 2022-23
- 11) Others – all documents as mentioned in the table "checklist of documents as prequalification criteria"
- 12) Approach & methodology ( as per FORM 7)

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13) Details of Technology to be used (as per FORM 8)

4.4.2. Financial Bid Submission

Financial bid shall be submitted as per the BOQ format given in the financial bid form (FORM 9). The bidder shall have to quote rates inclusive of, all duties, taxes, and other levies. The rates quoted should be firm for the entire contract period and no change/escalation on any account shall be allowed. Further, bifurcation of rates and applicable taxes will have to be quoted after bid opening. Presently this project is exempted from GST, however if applicable in future shall be paid as per prevailing rates.

Note: Chapter XXI-Miscellaneous, Section 171(1) of GST Act, 2017 governs the 'Anti Profiteering Measure' (APM). As per the provision of this section, 'Any reduction in rate of tax on any supply of goods or services or the benefit of input tax credit shall be passed on to the recipient by way of commensurate reduction in prices' Accordingly, the contractor should pass on the complete benefit accruing to him on account of reduced tax rate or additional input tax credit, to Authority. Further, all the provisions of GST, Act 2017 and from time to time will be applicable to the tender.

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## 5. TECHNICAL AND FINANCIAL BID EVALUATION

### 5.1. Technical Bid Evaluation

In the first stage, Technical Proposal will be evaluated for responsive check based on qualifying Criteria as provided in clause 2.3. For better understanding about the approach, methodology and proposed technology for the project, the Bidder may be called for a presentation on the date as communicated by Nagar Nigam Dehradun.

### 5.2. Financial Bid Evaluation

The Financial Bid of the technically qualified bidders shall be opened. For financial evaluation, the total cost indicated in the Financial Proposal (FORM 9), will be considered.

### 5.3. Selection of Bidder

Eligible proposals will finally be ranked according to ascending order of Financial Bid as illustrated below:


Sr. No.	Rank of Financial Score (FS)	Financial Bid (INR per Ton)
1	L1	
2	L2	
3	L3	
4	L4	


The selected applicant shall be the applicant having the 1<sup>st</sup> rank (L1) of Financial Bid. The second lowest Applicant (L2) shall be kept in reserve and may be invited in its discretion for negotiations in case the first-ranked (L1) applicant withdraws or fails to comply with the requirements of clauses 5.7, 5.8 and 5.9.

### 5.4. Clarifications

- 1) To facilitate evaluation of Proposals the Authority may, at its sole discretion, seek clarifications including details breakup of the financial proposal from any Bidder during the evaluation period. Such clarification(s) shall be provided within the time specified by the Authority for this purpose. Any request for clarification(s) and all clarification(s) shall be in writing. If a Bidder does not provide clarifications sought within the prescribed time, its Proposal shall be liable to be rejected. In case the Proposal is not rejected, the Authority may proceed to evaluate the Proposal by construing the particulars requiring clarification to the best of its understanding, and the Bidder shall be barred from subsequently questioning such interpretation of the Authority.

  
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- 2) Bidders are advised that the evaluation of Proposals will be entirely at the discretion of the Authority. Bidders will be deemed to have understood and agreed that no explanation or justification on any aspect of the Bidding Process or selection will be given. Any information contained in the Proposal shall not in any way be construed as binding on the Authority, its agents, successors, or assigns, but shall be binding against the Bidder if any Project is subsequently awarded to it under the Bidding Process based on such information. The Authority reserves the right not to proceed with the Bidding Process at any time without notice or liability and to reject any Proposal without assigning any reasons.

### 5.5. Confidentially


The Authority shall ensure that the rules for the bidding proceedings for the Project are applied in a non-discriminatory, transparent, and objective manner. The Authority shall not provide to any Bidder information about the Project or the bidding proceedings, which may have the effect of restricting competition. Information relating to the examination, clarification, evaluation, and recommendation for the short-listed pre-qualified Bidders shall not be disclosed to any person, who is not officially concerned with the processor is not a retained professional advisor advising the Authority in relation to or matters arising out of or concerning the Bidding Process. Any effort by a Bidder to influence Authority's evaluation of Bids or award decisions will result in the rejection of the Bidder's Bid.


### 5.6. Award of Contract

The Authority shall notify the selected/successful bidder by issuing a 'Letter of Acceptance' (LOA) that his bid has been accepted. The selected/successful Bidder shall acknowledge his acceptance of the LoA issued by the Authority within 7 (seven) days as evidenced by signing and sending a copy of the LoA issued. In the event the duplicate copy of the LoA duly signed by the Authorized signatory of the Selected Bidder is not received within the stipulated date, the Authority may, unless it consents to extension of time for submission thereof, appropriate the EMD of such Bidder on account of failure of the Selected Bidder to acknowledge the LoA.

### 5.7. Performance Security

Prior to the signing of the contract agreement, the successful Bidder shall have to furnish Performance Security to the Authority in the form of bank guarantee ("the Performance Bank Guarantee" (PBG)) issued by a nationalized / scheduled bank located in India or a reputable bank located abroad having corresponding bank in India, for an amount equivalent to 5% of the Contract Value. Failure of the successful bidder to comply with the requirements of this clause, shall constitute a breach of contract, cause for annulment of the award, forfeiture of the EMD, and any such other remedy the Authority may take under the contract, and the Authority may resort to awarding the contract to the next ranked bidder. The PBG shall be returned after 3 months after completion of the work and contract whichever is later.

  
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### 5.8. Signing of Contract Agreement

The successful bidder shall have to furnish the Performance security as directed above and sign the contract agreement within 21 days of issue of LoA. The signing of contract agreement shall be reckoned as intimation to commencement of work. No separate work order shall be issued by the Authority to the Bidder for commencement of work. In the event of failure of the successful bidder to submit Performance Security and or sign the Contract Agreement, his EMD shall stand forfeited without prejudice to the right of the Authority for taking any action against the bidder.

### 5.9. Stamp Duty, Legal Charges and Stationery Charges

The Bidder shall pay stamp duty on the contract and legal & stationery charges for preparation of the contract agreement, as per the applicable rules. The contract agreement shall be adjudicated for payment of stamp duty by successful Bidder on contract, advance or BG as the case may be.

### 5.10. Advance Payment for Mobilization

An advance payment for mobilization of maximum 10% of the Contract value against Bank Guarantee of 110% of the advance requested shall be allowed to avail by the Contractor/Selected/Successful Bidder. The said bank guarantee should be issued by a nationalized / scheduled bank located in India or a reputable bank located abroad having corresponding bank in India. The complete availed advance payment shall be deducted by NND from running bills till the occurrence of 80% of the total billable amount.

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## 6. FRAUD AND CORRUPT PRACTICES

The Bidders and their respective officers, employees, agents, and advisers shall observe the highest standard of ethics during the Bidding Process and after the issue of the LoA and during the subsistence of the Contract Agreement. Notwithstanding anything to the contrary contained herein, or in the LoA or the Contract Agreement, the Authority shall reject a Bid, withdraw the LoA, or terminate the Contract Agreement, as the case may be, without being liable in any manner whatsoever to the Bidder or Bidder, as the case may be, if it determines that the Bidder or Contract, as the case may be, has, directly or indirectly or through an agent, engaged in corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice in the Bidding Process. In such an event, the Authority shall forfeit and appropriate the EMD, or Performance Security is found by the Authority to have directly or indirectly or through an agent, engaged or indulged in any corrupt practice, fraudulent practice, coercive practice, undesirable practice, or restrictive practices.

For the purposes, the following terms shall have the meaning hereinafter respectively assigned to them:

### 6.1. Corrupt Practices

- 1) The offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence the actions of any person connected with the Bidding Process (for avoidance of doubt, offering of employment to or employing or engaging in any manner whatsoever, directly or indirectly, any official of the Authority who is or has been associated in any manner, directly or indirectly with the Bidding Process or the LoA or has dealt with matters concerning the Contract Agreement or arising there from, before or after the execution thereof, at any time prior to the expiry of one year from the date such official resigns or retires from or otherwise ceases to be in the service of the Authority, shall be deemed to constitute influencing the actions of a person connected with the Bidding Process); or
- 2) Engaging in any manner whatsoever, whether during the Bidding Process or after the issue of the LoA or after the execution of the Contract Agreement, as the case maybe, any person in respect of any matter relating to the Project or the LoA or the Contract Agreement, who at any time has been or is a legal, financial, or technical adviser of the Authority in relation to any matter concerning the Project.
- 3) Fraudulent practice means a misrepresentation or omission off acts or suppression of facts or disclosure of incomplete facts, to influence the Bidding Process.
- 4) Coercive practice means impairing or harming or threatening to impair or harm, directly or indirectly any person or property to influence any person's participation or action in the Bidding Process.
- 5) Undesirable Practice:

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Scientific Dumpsite Remediation of Legacy Waste and Land Reclamation through  
Bio-mining, Resource Recovery and Rejects Disposal at Danda Lakhaund site, Dehradun

- a) Establishing contact with any person connected with or employed or engaged by the Authority with the objective of canvassing, lobbying or in any manner influencing or attempting to influence the Bidding Process; or
  - b) Having a Conflict of Interest; and
- 6) Restrictive practice means forming a cartel or arriving at any understanding or arrangement among Bidders with the objective of restricting or manipulating a full and fair competition in the Bidding Process.

  
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## 7. PAYMENT SCHEDULE

### 7.1. Payment Mechanism

Payment disbursement for delivering each part of the scope of work will be as per following mechanism:

#### 7.1.1. Bio-mining of Legacy waste and suitable disposal of excavated material

Payment for the work shall be calculated by the Authority based on the following formula:

**Payment calculation for Work (P) = {(W-C) X R}- D**

Where,

**W** = Arithmetic sum of weight of all material in tons, brought into the processing plant setup by the bidder for processing.

**C** = Quantity of Rejects including Rubble/Stone having size more than 250 mm


**R** = Rate per ton in Rs.


**D** = Penalty as applicable in respective clauses

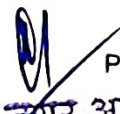
*The Authority will be releasing payment for the work based on the percentage of proposed land (100% of the earmarked land by the Authority) to be reclaimed as per the scope of work. The Bidder shall submit a report of reclaimed land area along with the monthly bills. The physical inspection of the dumpsite shall be conducted by the Engineer in Charge. Upon his satisfactory report, the payment shall be released by the Authority. (Please refer Annexure-3)*

**7.1.2.** The Bidder shall submit to the Authority a statement ("the Running Bill") on completion of every month, but in no case late than 7th (Seventh) day of the succeeding month or in case the 7th (Seventh) day is a holiday then on the following working day of such month. The statement should include the following details:


- 1) Quantity of Work Completed (in terms of material sent out from the dumpsite) at site including photographic evidence of the same.
- 2) Certificate from the Engineer-in-Charge certifying the work done and milestone achieved, as per the work plan.
- 3) The documents furnishing the proof of disposal/ utilization (with date, quantity, other details) at the suitable location for the product (inert, combustible, others if any). Utilization certificate of disposed material must be furnished. Please refer to the "Scope of work, Part-A, Clause-1, "Sub Clause (xix)" for requirement of documents.
- 4) All disposal vehicles must be GPS enabled. In case the vehicles are not installed with GPS devices, the successful bidder shall provide sufficient

  
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evidence of RDF disposal as per the environmental norms, to NND for satisfactory approval.

- 5) The Bidder shall also submit a report on topographical/contour survey, stating the total quantum of the waste at the beginning, waste removed from the site, area reclaimed if any and the remaining volume of the waste along with each running bill.. In case if the required report on topographical/contour survey is not submitted by the Bidder/Contractor the NND shall levy Rs. 2 lacs for each incidence.
- 6) The payments shall be released on monthly basis, subject to the compliances of all the clauses mentioned above and in the scope of work,

Note: All the payments shall be made after deduction of penalties/fine (if any), utility charges such as electricity bills, etc., or and any other deduction, as applicable.


All Payments shall be made upon Approval by NND Officials (Physical Inspection of reclaimed land and document verification of submitted Monthly Progress Report as per Annexure 3).

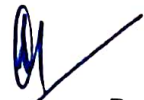
## 7.2. Liquidated Damages


In case the work is not completed within the stipulated period of completion, as mentioned in the RFP and along with all such extensions, which are granted to the Bidder for either Authority's default or Force Majeure or as decided by Authority, the compensation shall be levied on the Bidder at the rate of Rs. 20,000 /- per day of delay limited to maximum of 10% of the Contract Value.

- 1) The Authority will deduct the liquidated damages from payments due to the Bidder. If the cumulative liquidated damage amount equals 10% of the Contract Value, the authority may:
- 2) Terminate the contract agreement and forfeit the EMD and the Performance Security.
- 3) Retain the Bidder on depositing the amount equivalent to such liquidity damage of 10% of the contract amount. However, the retention of the Bidder on such ground shall not free him from his liabilities for completion of the work or any future imposition of liquidity damages.
- 4) The decision of the Authority in this regard shall be final and binding upon both the parties.

  
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### 7.3. Key Performance Indicators (KPIs) and Penalty for Non-compliance

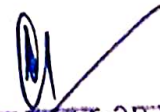
S. No.	Key Performance Indicator/ Penalty Description	Penalty Amount
1	Non-compliance to SWM Rules 2016, CPCB norms, Environment (Protection) Act, 1986 and other Environmental Standards, statutory norms guidelines and their amendments from time to time notified by regulatory authorities or as specified in the Contract.	Rs.20,000/- per incidence per day, till the compliance of the failure is achieved.
2	Non-compliance of Safety Standards, use of Personal Protective Equipment, fire safety, slope stability while forming windrows (if any during pre-stabilization process) by the workers.	Rs.20,000/- per incidence per day, till the compliance of the failure is achieved.
3	Non-compliance against disposal mechanism as prescribed in the scope of work (for inert, combustible or any other product).	Rs.10,000/- per incidence per day, till the compliance of the failure is achieved.
4	Non-provision of Site Facilities as per the work plan, submitted by the Bidder at the start of work and duly approved by the Authority.	Rs.10,000/- per item per day, till the compliance of the failure is achieved
5	Non-achievement of quarterly milestones, with respect to the reduction of waste quantities as per work schedule.	0.5% of the missed quantities for that milestone. (Missed quantity X Rate per ton X 0.5%).
6	Non-function of weighment system due to Technical Problems, in case it is not rectified within 24 hrs.	Rs. 10,000/- per incidence per day, till the compliance of the failure is achieved.
7	Tampering of records at weighbridge or submission of manipulated records or any malpractice which will affect quantity & quality of work done.	50% of the value of bills certified for three (03) preceding months from the month of incidence noticed.
8	Accumulation of excavated material for more than 30 days at the facility.	Rs. 10,000/- per incidence per day, till the compliance of the failure is achieved.


Note:

# All the penalties, mentioned above, shall be in addition to the Penalties/Actions imposed by concerned regulatory / statutory authorities for non-compliances.

  
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## 8. FORCE MAJEURE

### 8.1. Definition


- 1) For the purposes of this Contract, "Force Majeure" means an event which is beyond the reasonable control of a Party, is not foreseeable, is unavoidable and not brought about by or at the instance of the Party claiming to be affected by such events and which has caused the non-performance or delay in performance, and which makes a Party's performance of its obligations hereunder impossible or so impractical as reasonably to be considered impossible in the circumstances, and includes, but is not limited to, war, riots, civil disorder, earthquake, fire, explosion, storm, flood or other extreme adverse weather conditions, industrial action (except where such strikes, lockouts or other industrial action are within the power of the Party invoking Force Majeure to prevent), confiscation or any other action by Government agencies.
- 2) Force Majeure shall not include (i) any event which is caused by the negligence or intentional action of a Party or by or of such Party's Sub-Bidders or agents or employees, nor (ii) any event which a diligent Party could reasonably have been expected both to consider at the time of the conclusion of this Contract and avoid or overcome in the carrying out of its obligations hereunder.


### 8.2. No Breach of Contract


The failure of a Party to fulfil any of its obligations hereunder shall not be considered to be a breach of, or default under, this Contract in so far as such inability arises from an event of Force Majeure, provided that the Party affected by such an event has taken all reasonable precautions, due care, and reasonable alternative measures, all with the objective of carrying out the terms and conditions of this Contract.

### 8.3. Measures to be taken


- 1) **Procedure for calling Force Majeure:** The Concessionaire shall inform the Authority by providing a written application enclosed with proofs/ evidence to the Municipal Commissioner of Dehradun. The Commissioner may verify the facts and figures based on the application submitted by the concessionaire and Approve or Deny any event under Force Majeure. The Municipal Commissioner shall take the final approval on the same based on the presented data.
- 2) A Party affected by an event of Force Majeure shall continue to perform its obligations under the Contract as far as is reasonably practical and shall take all reasonable measures to minimize the consequences of any event of Force Majeure.
- 3) A Party affected by an event of Force Majeure shall notify the other Party of such event as soon as possible, and in any case not later than fourteen (14) days following the occurrence of such event, providing evidence of the nature

  
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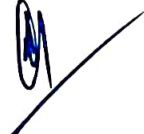
  
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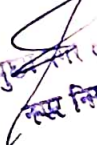
and cause of such event, and shall similarly give written notice of the restoration of normal conditions as soon as possible.

- 4) Any period within which a Party shall, pursuant to this Contract, complete any action or task, shall be extended for a period equal to the time during which such Party was unable to perform such action as a result of Force Majeure.
- 5) During the period of their inability to perform the Services as a result of an event of Force Majeure, the Bidder, upon instructions by the "Authority", shall either:
  - a) Demobilize,
  - OR
  - b) Continue with the Services to the extent possible, in which case the Bidder shall continue to be paid proportionately and on pro-rata basis, under the terms of this Contract.

  
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## 9. TERMINATION

### 9.1. Default conditions for termination

- 1) **Termination on expiry of the Contract:** The Agreement shall be deemed to have been automatically terminated on the expiry of the Contract period unless the Authority has exercised its option to extend the Contract in accordance with the provisions, if any, of the Contract.
- 2) **Termination on account of Force Majeure:** Either party shall have the right to terminate the Contract on account of Force Majeure, as set forth in Section 8.

### 9.2. Termination due to Event of Default of Bidder

The failure on the part of the successful bidder to perform any of its obligations or comply with any of the terms of this Tender shall constitute an Event of Default on the part of the successful bidder. The events of default as mentioned above may include, inter-alia, the following:

- 1) The successful bidder has failed to perform any instructions or directives issued by the Authority which it deems proper and necessary to execute the scope of work under the tender.
- 2) The successful bidder has failed to remedy a failure to perform its obligations in accordance with the specifications issued by Authority, despite being served with a default notice which laid down the specific deviance on the part of the successful bidder to comply with any stipulations or standards as laid down by Authority.
- 3) The successful bidder has failed to conform with any of the specifications as set out in the tender or has failed to adhere to any amended direction, modification or clarification as issued by Authority and which Authority deems proper and necessary for the execution of the scope of work under this tender.
- 4) There is a proceeding for bankruptcy, insolvency, winding up or there is an appointment of receiver, liquidator, assignee, or similar official against or in relation to the successful bidder.
- 5) The successful bidder or its team has failed to comply with or is in breach or contravention of any applicable laws.
- 6) The successful bidder has failed to comply with any terms and conditions of this tender.
- 7) The misrepresentation of facts at any point of time.

In the event of any default by the successful bidder as stated above, Authority will issue a Notice to the bidder in writing setting out specific defaults / deviances / omissions. The successful bidder will need to remedy the default/ deviances / omissions committed

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within thirty (30) days of the receipt of the notice to the satisfaction of Authority. In case, the successful bidder fails to remedy the default to the satisfaction of Authority, Authority will be entitled to terminate the Agreement in full or in part. Authority will revoke the Performance Security/EMD, provided by the bidder. Authority will not be required to refund any money received from the bidder. Upon termination of the Agreement, the Authority also has the right to debar the Bidder from participating in future works. If the project is terminated, then Authority will take possession of the plant and no compensation will be paid to the bidder.

### 9.3. Consequences of Termination

In all cases of termination herein set forth, the obligation of the parties shall be limited to the period up to the date of effective termination. However, notwithstanding the termination of the Agreement, the parties shall continue to be bound by the provisions of the Agreement that reasonably require some action or for adherence after such termination.

### 9.4. Payment upon Termination

Upon termination of the Agreement, the Authority shall make the payments against remuneration for services satisfactorily performed prior to the effective date of termination to the Bidder. All the payments shall be made after offsetting any amount that may be due from the Bidder to the Authority.

### 9.5. Withdrawal of Termination

Notwithstanding anything inconsistent contained in this contract, if the Bidder served with the termination Notice cures the underlying event of default to the satisfaction of NND at any time before the termination occurs, the termination notice may be withdrawn by the NND which had issued the same. Provided that the party in breach shall compensate the ULB for any direct costs/ consequences occasioned by the event of default which caused the issue of termination notice.



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## 10. DISPUTE RESOLUTION

Any dispute, differences or claim arising between the parties, which are not resolved amicably, shall be decided finally under the Laws of India, and the Courts at Dehradun shall have jurisdiction over all matters arising out of or relating to this document.

## 11. MISCELLANEOUS

The Authority, in its sole discretion and without incurring any obligation or liability, reserves theright, at any time, to:

- 1) Suspend and/or cancel the Bidding Process and/or amend and/or supplement the Bidding Process or modify the dates or other terms and conditions relating there to.
- 2) Consult with any Bidder to receive clarification or further information including justification of financial bid submitted.
- 3) Retain any information and/ or evidence submitted to the Authority by, on behalf of, and/or in relation to any Bidder; and/or
- 4) Independently verify, disqualify, reject and/ or accept all submissions or other information and/ or evidence submitted by or on behalf of any Bidder.
- 5) It shall be deemed that by submitting the Bid, the Bidder agrees and releases the Authority, it employees, agents and advisers, irrevocably, unconditionally, fully and finally for many and all liability for claims, losses, damages, costs, expenses or liabilities in any way related to or arising from the exercise of any rights and/ or performance of any obligations hereunder, pursuant hereto and/ or in connection herewith and waives any and all rights and/ or claims it may have in this respect, whether actual or contingent, whether present or future.

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## 12. FORMS FOR BID SUBMISSION

### FORM 1: LETTER COMPRISING THE BID CUM UNDERTAKING

(On Non-Judicial Stamp of INR.100)

To,  
Municipal Commissioner,  
Nagar Nigam Dehradun,  
1 Patel Road Dehradun, Uttarakhand – 2480001


Sub: REQUEST FOR PROPOSAL (RFP) for Scientific Dumpsite Remediation of Legacy Waste and Land Reclamation through Bio-mining, Resource Recovery and Scientific Rejects Disposal at Dehradun at Danda Lakhaund Landfill Site, Dehradun."

Dear Sir,

With reference to your RFP document dated....., I/we, have examined the Bidding Documents and understood their contents, hereby submit my/our Bid for the aforesaid Project of "Remediation of Landfill Site through Bio-mining of 4,18,374 m<sup>3</sup> (+/- 20%) Tons of Legacy Waste and Disposal of excavated material and Reclamation of Land Danda Lakhaund, Dehradun." and state as under:


- 1 The Bid is unconditional and unqualified.
- 2 All information provided in the Bid and in the Annexures is true and correct.
- 3 This statement is made for the express purpose of qualifying as a Bidder for the Project as explained in this RFP document.
- 4 I/We shall make available to the Authority for any additional information it may find necessary or require supplementing or authenticate the Bid.
- 5 I/We acknowledge the right of the Authority to reject our Bid without assigning any reason or otherwise and hereby waive our right to challenge the same on any account whatsoever.
- 6 We certify that in the last three years, we never failed to perform on any contract, as evidenced by judicial pronouncement or arbitration award, nor been expelled from any project or contract nor have had any contract terminated for breach on our part.
- 7 I/We declare that:
  - I/We have examined and have no reservations to the Bidding Documents, including any Addendum issued by the Authority.
  - I/We do not have any conflict of interest in accordance with Clauses 2.11 of the RFP document.
  - I/We have not directly or indirectly or through an agent engaged or indulged in any corrupt practice, fraudulent practice, coercive practice, undesirable practice,

  
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or restrictive practice, as defined in the RFP document, in respect of any tender or request for proposal issued by or any agreement entered in to with the Authority or any other public sector enterprise or any government, Centre or State; and

- I/We hereby certify that we have taken steps to ensure that in conformity with the provisions of Clause 6 of the RFP, no person acting for us or on our behalf has engaged or will engage in any corrupt practice, fraudulent practice, coercive practice, undesirable practice, or restrictive practice.
- 8 I/We understand that you may cancel the Bidding Process at any time and that you are neither bound to accept any Bid that you may receive nor to invite the Bidders to Bid for the Project, without incurring any liability to Bidders.
- 9 I/We believe that we satisfy(ies) the pre-qualifying criteria and meet(s) the requirements as specified in the RFP document and am/are qualified to submit this Bid.
- 10 I/We declare that we are not a member of any other bidder submitting a Bid for the Project.
- 11 I/We certify that we have not been convicted by a Court of Law or indicted or adverse orders passed by a regulatory authority which could cast a doubt on our ability to undertake the Project which relates to a grave offence that outrages the moral sense of the community.
- 12 I/We further certify that regarding matters relating to security and integrity of the country, we have not been charge- sheeted by any Bidder of the Government or convicted by a Court of Law for any offence committed by us or by any of our Associates.
- 13 I/We undertake that in case due to any change in facts or circumstances during the Bidding Process, we are attracted by the provisions of disqualification in terms of the guidelines referred to above, we shall intimate the Authority of the same immediately.
- 14 I/We hereby irrevocably waive any right, which we may have at any stage at law or howsoever otherwise arising to challenge, or question any decision taken by the Authority in connection with the selection of the Bidder, or in connection with the Bidding Process itself, in respect of the above-mentioned Project and the terms and implementation thereof.
- 15 In the event of my/our being declared as the Selected Bidder, I/We agree to enter into a Contract Agreement in accordance with the draft that has been provided to me/us prior to the Bid Due Date. We agree not to seek any changes in the aforesaid draft and agree to abide by the same.
- 16 I/We have studied all the Bidding Documents carefully and surveyed the project area. We understand that except to the extent as expressly set forth in the Contract Agreement, we shall have no claim, right or title arising out of any documents or

  
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information provided to us by the Authority or in respect of any matter arising out of or concerning or relating to the Bidding Process including the award of Contract.

- 17 The Financial Bid has been quoted by me/us after taking into consideration all the terms and conditions stated in the RFP and draft Contract Agreement, our own estimates of costs and careful assessment of the site and all the prevailing and expected conditions that may affect the Bid.
- 18 I/We offer to the Authority a Bid Document Fees of INR 20,000/- and EMD of Rs. 80 lakhs through offline transaction, submitted online as specified in this RFP document.
- 19 I/We agree and understand that the Bid is subject to the provisions of the Bidding Documents. In no case, I/We shall have any claim or right of whatsoever nature if the Project/Contract is not awarded to me/us or our Bid is not opened.
- 20 I/We hereby submit our Bid in the form as specified in the RFP document for undertaking the aforesaid Project in accordance with the Bidding Documents and the Contract Agreement.
- 21 I/We agree to keep this offer valid for 180 (One Hundred Eighty) days from the Due Date of online Bid submission as specified in the RFP document or any other such duration as directed by the Authority.
- 22 I/We agree and undertake to abide by all the terms and conditions of the RFP document. In witness thereof, I/we submit this Bid under and in accordance with the terms of the RFP document.
- 23 I/we have received all the clarifications issued by the Authority.
- 24 I/we will abide by the terms and condition set forth in the RFP document, condition of contract and draft Contract agreement and a copy of the same bearing initial of the undersign on every page is attached herewith.
- 25 Notwithstanding any qualification or conditions, whether implied or otherwise, contained in our Proposal we hereby represent and confirm that our Proposal is unqualified and unconditional in all respects.


Yours faithfully,

Date:


(Signature of the Authorized Signatory)

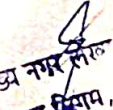
Place:

(Name and designation of the Authorized Signatory)

  
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**FORM 2: FORMAT FOR GENERAL INFORMATION OF THE BIDDER**

S. No.	Particulars	Individual Bidder Company (1)
1.	Name of the Bidding company	
2.	Date of incorporation and /or Commencement of Business	
3.	Brief description of the Bidder's main line of business	
4.	Details of individual (s) who will serve as the point of contact/ communication for Authority with the Bidder:	
a.	Name	
b.	Designation	
c.	Company/Firm	
d.	Address:	
e.	Mobile Number	
f.	Email Address	
g.	Fax Number	
5.	Details of Authorized Signatory of Bidder	
a.	Name	
b.	Designation	
c.	Company/Firm	
d.	Address:	
e.	Mobile Number	
f.	Email Address	
g.	Fax Number	

  
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**FORM 3: POWER OF ATTORNEY FOR SIGNING OF BID**

Know all men by these presents, We, \_\_\_\_\_ (name of Firm and address of the registered office) do hereby constitute, nominate, appoint, \_\_\_\_\_ and authorize Mr./Ms. \_\_\_\_\_ Son / daughter / wife and presently residing at \_\_\_\_\_ who is presently employed with / retained by us and holding the position of \_\_\_\_\_ as our true and lawful attorney (hereinafter referred to as the "Authorized Representative") to do in our name and on our behalf, all such acts, deeds and things as are necessary or required in connection with or incidental to submission of our (Project), proposals and other documents and writings, participating in pre-bid and other conference and providing information / responses to the Authority, representing us in all matters before the Authority, signing and execution of all contracts and undertakings consequent to acceptance of our proposal and generally dealing with the Authority in all matters in connection with or relating to or arising out of us Proposal for the said consultancy job and/or upon award thereof to us till the entering of the Agreement with the Authority.

AND we do hereby agree to ratify and confirm all acts, deeds and things lawfully done or caused to be done by our said Authorized Representative pursuant to and in exercise of the powers conferred by this Power of Attorney and that all acts, deeds, and things done by our said Authorized Representative in exercise of the powers hereby conferred shall and shall always be deemed to have been done by us.

IN WITNESS WHERE OF WE, \_\_\_\_\_ THE ABOVE-NAMED PRINCIPAL HAVE EXECUTED THIS POWER OF ATTORNEY ON THIS \_\_\_\_\_ DAY OF \_\_\_\_\_.

For (Signature, Name, Designation and Address) Witnesses:

1) \_\_\_\_\_

2) \_\_\_\_\_

Notarized

Accepted (Signature, name designation and address of the Attorney)

Notes:


The mode of execution of the Power of Attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executants (s) and when it is so required the same should be under common seal affixed in accordance with the required procedure. Wherever required, the Applicant should submit for verification the extract of the charter documents and other documents such as a resolution / power of attorney in favor of the person executing this Power of Attorney for the delegation of power here under on behalf of the Applicant.

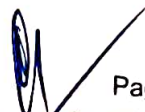
.....  
(Signature)

.....  
(Signature)

.....  
(Signature)

  
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FORM 4: FORM FOR FINANCIAL PRE- QUALIFICATION

TURNOVER

Financial Year	Annual Turnover (In INR)
2018-19	
2019-20	
2020-21	
2021-22	
2022-23	


Net Worth as on Year1 (Financial Year preceding to Due date of Bidding):


\_\_\_\_\_ INR

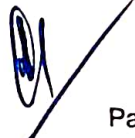
Note:

- The financial year shall mean the period commencing from April 1 of any given year to March 31 of the succeeding year.
- The Bidder shall provide the Audited Annual Financial Statements of the corresponding years. Failure to do so would result in the Proposal being considered as non-responsive. In case the annual accounts for the latest financial year are not audited and therefore cannot make it available, the applicant shall give an undertaking, to this effect and the statutory auditor shall certify the same. In such case, the applicant shall provide the audited annual reports for five years preceding the year for which audited annual report is not being provided.
- A certificate from Statutory Auditor should be provided as supporting document certifying the Financial Pre-Qualification

(Signature of the Authorized signatory)

  
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**FORM 5: FORMAT FOR SUMMARY OF TECHNICAL PRE-QUALIFICATION**

(List only those works, which are like the proposed works for which the Qualification Information is submitted)


**Summary Table**


Name of Applicant Claiming the Project Experience:  
\_\_\_\_\_

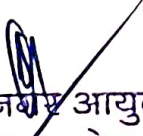
S. No.	Brief Project Description	Project Award Date (Only those Project(s) awarded in preceding 5 FY from due date of bidding shall be considered)	Project Completion Date/ expected completion date	Project Cost in INR (Cr)	Project Capacity (In MT) (A)	Claiming Entity's Share in the Project (%) (B)	Effective Handled Capacity Ax B (C) (In M)

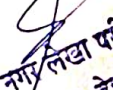
Average Project Capacity (As per column 'C') of eligible projects managed (as mentioned in summary table above is \_\_\_\_\_(in MT).

1. The details of each of the works mentioned in the above table must be provided separately in FORM 6.
2. Provide attested copies of Work Orders and /or Completion Certificates for each project. Work orders/ testimonials will be verified if required.
3. Each certificate of experience will be duly signed/confirmed by a representative of the client (to be of at least Executive Engineer Rank).

  
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**FORM 6: DETAILS OF PROJECTS ELIGIBLE FOR TECHNICAL  
PRE-QUALIFICATION**

*(Provide Details for Only those Projects listed in Form 5, use separate sheet for each project)*

Name of Applicant Claiming the Project Experience:	
1.	Name of Project
2.	Location of Project
3.	Name of the Client
4.	Client's Address & Telephone Number, Fax Number, and email ID of contact person
5.	Project Cost (in INR Cr)
6.	Nature of works and special features relevant to this project. <i>(Details pertinent to the Technical Criteria of this RFP shall be submitted)</i>
7.	Contract role (check one) — Sole Bidder — Consortium/JV — Sub-Bidder
8.	Project Capacity: <i>(In TPD)</i> Total Legacy Waste Processed: <i>(In Tons)</i> Your Company's share in the Project (%):
9.	Date of Award
10.	Contract duration <i>(In Years, Months)</i>
11.	Date of Completion Or For Ongoing Project % of completion
12.	Whether completed in specified duration, If no, reason for delay

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13.	Specified requirements	
14.	Name and professional qualifications of applicant's Engineer-in-Charge of the work:	
15.	Were there any penalties/fines/stop-notice/compensation/liquidated damages imposed? (Yes or no). If yes, give amount and explanation.	
16.	Population of the City	
17.	Total Quantity of RDF disposed:	
18.	Total Quantity of Bio-Soil/Inert disposed:	
19.	reclamation of dumpsite land area from legacy waste	
20.	Consent to Operate certificate in the name of:	

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## FORM 7: FORMAT FOR SUBMITTING APPROACH & METHODOLOGY

The Bidder will submit an A&M, covering the following broad topics:

1. Site Development Plan,
2. Process layout and description of the activities with the help of appropriate drawings, general arrangement of machineries, etc.
3. Indicate number, type, and capacity of equipment's/machinery to be deployed for the purpose of excavation, segregating, sorting, retrieving recoverable materials, storing, baling, packing, selling and provide the basis for deciding the number.
4. Recyclable and Combustible (RDF) fractions utilization mechanism
5. Disposal strategy for Soil Enricher and Inert/C&D material.
6. Leachate collection, treatment system and surface water drainage plan.
7. Time period estimated for the activity – Detailed Work Plan to be provided by the Bidder, indicating quarterly milestones for each activity, as per the scope of work.
8. Operation and maintenance details.
9. Organization & Staffing Plan - Quantity of resources required.
10. Curriculum vitae of the resources
11. Environment, Health, and Safety Management Plan

The Bidder shall furnish a brief write-up of the following points:

- a. Plan for Mitigation of Pollution during Project Execution work
- b. Measures to manage hazardous waste if any during the project execution
- c. Plan for Health and safety in and around the workplace to be followed during project execution
- d. Emergency preparedness plan
- e. Measures for Fire safety
- f. Measures for Health and safety of worker

All the above should be suitably supported with the engineering drawings, pert charts, Gantt Charts (Wherever applicable), fuel/power requirement and explanation of estimated time schedule.

### Warranty for the Work

The successful bidder warrants that all work under this Agreement will be performed with promptness and diligence and will be executed in a worker like and professional manner, in accordance with the practices and high professional standards used in well-managed operations performing work like the work under this tender document.


### Insurance




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The successful bidder will, during the entire project period, at its sole cost and expense, obtain and maintain in full force and effect, adequate standard forms of insurance which are mandatorily to be maintained as per the applicable laws.



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**FORM 8: FORMAT FOR PROVIDING DETAILS OF TECHNOLOGY TO BE USED FOR  
THE PROJECT**

**1. Technology:**

The Bidder is free to choose best process and technology (equipment) for legacy waste management. The Bidder will submit an A&M, covering the following broad topics:

- Type of technology
- Adopted for (name of ULBs/cities)
- Reasoning behind adopting the particular technology
- Comparison with other available technology

**2. Equipment**

The bidder shall use the best machineries and equipment's available with latest technology. An indicative list of equipment required based on the quantity of legacy waste as below-

Trommels, Soil Precision Separator, Air Density Blowers, Air Suction Machines, Conveyors, Shredder, Ballistic Separator, Magnetic Separator etc.

*(Details of machineries (including numbers, capacity, condition etc. to be provided while proposing the technology for this project.)*

**3. Process**

The bidder shall provide a process flow chart and waste flow diagrams for different waste streams along with estimated waste quantities to be disposed on daily and monthly basis)

**Note:**

- List only the key equipment for construction, standby power, material handling and vehicles for site, etc., which the Company proposes to use for the proposed works at the site.
- The Bidder should clearly demonstrate that he has access to all key equipment which will be required for the successful completion of the works.

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**FORM 9: FINANCIAL PROPOSAL SUBMISSION FORM FORMAT**

(To be submitted online only)

NIT No.				
Dated:				
Name of the Bidder/ Bidding Firm/ Company:				
<b>PRICE SCHEDULE</b>				
(This BOQ template must not be modified/replaced by the bidder and the same should be uploaded after filling the relevant columns, else the bidder is liable to be rejected for this tender.				
Bidders are allowed to enter the Bidder Name and Values only)				
S. No.	Item Description	Quantity	Rate in Rs. (Per Ton)	Amount (INR)
1	2	3	4	5
1	Processing of old dumped waste/legacy waste through – Bioremediation and bio mining at Danda Lakhaund, Dehradun landfill site of NAGAR NIGAM DEHRADUN including segregation, Transportation, and disposal of segregated and recovered material as per SWM rules 2016 and as per scope of work			

\* Above rates are inclusive of all applicable taxes except GST, as presently GST is not applicable to this work.

  
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**FORM 10: DRAFT FORM FOR UNDERTAKING ON  
PARENT COMPANY GUARANTEE**

*(To be furnished in Company's letterhead)*

Name of Contract/Contract No. \_\_\_\_\_

Name and address of Employer: \_\_\_\_\_

\_\_\_\_\_ (Together with successors and assigns)

We have been informed that \_\_\_\_\_ (Name of Bidder) (hereinafter called the "Bidder") is submitting an offer for such Contract in response to your invitation, and that the conditions of your invitation require his offer to be supported by a parent company guarantee. In consideration of you, the Employer, awarding the Contract to the Bidder, we (name of parent company) irrevocably and unconditionally guarantee to you, as a primary obligation, (i) the due performance of all the Bidder's obligations and liabilities under the Contract, including the Bidder's compliance with all its terms and conditions according to their true intent and meaning; (ii) for the entire duration of the Contract, we will make available to the Bidder our technical capacity, expertise and resources required for the Bidder's satisfactory performance of the Contract; and (iii) that we are fully committed, along with the Bidder, to ensuring a satisfactory performance of the Contract.

If the Bidder fails to so perform his obligations and liabilities and comply with the Contract, we will indemnify the Employer against and from all damages, losses, and expenses (including legal fees and expenses) which arise from any such failure for which the Bidder is liable to the Employer under the Contract, this guarantee shall come into full force and effect when the Contract comes into full force and effect.

If the Contract does not come into full force and effect within a year of the date of this guarantee, or if you demonstrate that you do not intend to enter the Contract with the Bidder, this guarantee shall be void and ineffective. This guarantee shall continue in full force and effect until all the Bidder's obligations and liabilities under the Contract have been discharged, when this guarantee shall expire and shall be returned to us, and our liability hereunder shall be discharged absolutely.


This guarantee shall apply and be supplemental to the Contract as amended or varied by the Employer and the Bidder from time to time. We hereby authorize them to agree any such amendment or variation, the due performance of which and compliance with which by the Bidder are likewise guaranteed hereunder.


Our obligations and liabilities under this guarantee shall not be discharged by any allowance of time or other indulgence whatsoever by the Employer to the Bidder, or by any variation or suspension of the works to be executed under the Contract, or by any amendments to the Contract or to the constitution of the Bidder or the Employer, or by any other matters, whether with or without our knowledge or consent.


This guarantee shall be governed by the law of the same country (or other jurisdiction) as that which governs the Contract and any dispute under this guarantee shall be finally settled under the Laws in India provided in the Contract. We confirm that the benefit of this guarantee may be assigned subject only to the provisions for assignment of the Contract.

Signed by: \_\_\_\_\_

Signed by: \_\_\_\_\_

  
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(signature)

(signature)

\_\_\_\_\_  
(name)

\_\_\_\_\_  
(name)

\_\_\_\_\_  
(Position in parent company)

\_\_\_\_\_  
(Position in parent company)

Date: \_\_\_\_\_

*Note: A failure to furnish the Parent Company Guarantee as appropriate, shall result in the rejection of the tender.*

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**FORM 11: DRAFT FORM FOR UNDERTAKING ON SUBSIDIARY GUARANTEE**

*(To be furnished in company's letterhead)*

Name \_\_\_\_\_ of \_\_\_\_\_ Contract/Contract \_\_\_\_\_ No. \_\_\_\_\_

\_\_\_\_\_  
Name \_\_\_\_\_ and \_\_\_\_\_ address \_\_\_\_\_ of \_\_\_\_\_ Employer: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_ (Together with successors and assigns). We have  
been informed that \_\_\_\_\_ (Name of Bidder) (hereinafter  
called the "Bidder") is submitting an offer for such Contract in response to your invitation, and  
that the conditions of your invitation require his offer to be supported by a Subsidiary company  
guarantee.

In consideration of you, the Employer, awarding the Contract to the Bidder, we  
\_\_\_\_\_ (

name of Subsidiary company) irrevocably and unconditionally guarantee to you, as a primary  
obligation, (i) the due performance of all the Bidder's obligations and liabilities under the  
Contract, including the Bidder's compliance with all its terms and conditions according to their  
true intent and meaning; (ii) for the entire duration of the Contract, we will make available to  
the Bidder our technical capacity, expertise and resources required for the Bidder's  
satisfactory performance of the Contract; and (iv) that we are fully committed, along with the  
Bidder, to ensuring a satisfactory performance of the Contract.

If the Bidder fails to so perform his obligations and liabilities and comply with the Contract, we  
will indemnify the Employer against and from all damages, losses, and expenses (including  
legal fees and expenses) which arise from any such failure for which the Bidder is liable to the  
Employer under the Contract.

This guarantee shall come into full force and effect when the Contract comes into full force  
and effect. If the Contract does not come into full force and effect within a year of the date of  
this guarantee, or if you demonstrate that you do not intend to enter the Contract with the  
Bidder, this guarantee shall be void and ineffective. This guarantee shall continue in full force  
and effect until all the Bidder's obligations and liabilities under the Contract have been  
discharged, when this guarantee shall expire and shall be returned to us, and our liability  
hereunder shall be discharged absolutely.

This guarantee shall apply and be supplemental to the Contract as amended or varied by  
the Employer and the Bidder from time to time. We hereby authorize them to agree any such  
amendment or variation, the due performance of which and compliance with which by the  
Bidder are likewise guaranteed hereunder.

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Our obligations and liabilities under this guarantee shall not be discharged by any allowance of time or other indulgence whatsoever by the Employer to the Bidder, or by any variation or suspension of the works to be executed under the Contract, or by any amendments to the Contract or to the constitution of the Bidder or the Employer, or by any other matters, whether with or without our knowledge or consent.

This guarantee shall be governed by the law of the same country (or other jurisdiction) as that which governs the Contract and any dispute under this guarantee shall be finally settled under the Laws in India provided in the Contract. We confirm that the benefit of this guarantee may be assigned subject only to the provisions for assignment of the Contract,

Signed by: \_\_\_\_\_  
(signature)

Signed by: \_\_\_\_\_  
(signature)

\_\_\_\_\_  
(name)

\_\_\_\_\_  
(name)

\_\_\_\_\_  
(Position in subsidiary company)

\_\_\_\_\_  
(Position in subsidiary company)

Date: \_\_\_\_\_

Note: A failure to furnish the Subsidiary Company Guarantee as appropriate, shall result in the rejection of the tender.



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**FORM 12 - FORMAT FOR DECLARATION BY THE BIDDER FOR NOT BEING BLACKLISTED / DEBARRED**

*(To be furnished on Rs. 500 Stamp paper)*

Date:

To,  
Municipal Commissioner,  
NAGAR NIGAM DEHRADUN,  
1, Patel Road, Dehradun – 248001

Sub: REQUEST FOR PROPOSAL (RFP) FOR Scientific Dumpsite Remediation of Legacy Waste and Land Reclamation through Bio-mining, Resource Recovery and Scientific Rejects Disposal at Dehradun at Danda Lakhaund Landfill Site, Dehradun."


Dear Sir/ Ma'am,

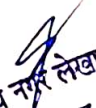
I, authorized representative of M/s \_\_\_\_\_, hereby solemnly confirm that M/s \_\_\_\_\_ ("Company / Society") is not debarred/ black-listed by the Central Government/ any State Government/ ULBs/ Public Sector Undertaking in India or similar agencies globally for unsatisfactory past performance, corrupt, fraudulent or any other unethical business practices or for any other reason as on last date of submission of the Bid. In the event of any deviation from the information/ declaration, NND reserves the right to reject the bid or terminate the Contract without any compensation to the Successful Bidder.

Thanking You,

Yours Faithfully,

  
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**FORM 13 - Performa of Performance Bank Guarantee**

**THIS DEED OF GUARANTEE** executed on this the \_\_\_\_\_ day of \_\_\_\_\_ at \_\_\_\_\_ by \_\_\_\_\_ (Name of the Bank) having its Head/Registered office at \_\_\_\_\_ hereinafter referred to as "the Guarantor" which expression shall unless it be repugnant to the subject or context thereof include successors and assigns;

**In favor of**

Nagar Nigam Dehradun, Uttarakhand, Pin-248001 hereinafter referred to as "NND", which expression shall, unless repugnant to the context or meaning thereof include its administrators, successors, or assigns.

**WHEREAS**

By the Contract entered into between NND and \_\_\_\_\_, a company incorporated under the provisions of the Companies Act, 2013 / registered under....., having its registered office/ permanent address at \_\_\_\_\_ ("the Service Provider"), has been granted the permission for Scientific Dumpsite Remediation of Legacy Waste and land Reclamation through Bio-Mining, Resource Recovery and Rejects Disposal at Danda Lakhaund site, Dehradun (hereinafter referred to as "the work").

A. In terms of the Contract, the Service Provider is required to furnish to NND, an unconditional and irrevocable bank guarantee for an amount of Rs.....as security for due and punctual performance/dischage of its obligations under the Contract, relating to Work by the Service Provider.


B. At the request of the Service Provider, the Guarantor has agreed to provide bank guarantee, being these presents guaranteeing the due and punctual performance/dischage by the Service Provider of its obligations relating to the work.


**NOW THEREFORE THIS DEED WITNESSETH AS FOLLOWS:**


1. The Guarantor hereby irrevocably guarantees the due and punctual performance by M/s. \_\_\_\_\_ (hereinafter called "the Service Provider") of all its obligations relating to the Work and in connection with achieving the work objectives by the Service Provider in accordance with the Contract.

2. The Guarantor shall, without demur, pay to NND sums not exceeding in aggregate Rs. .... within seven (7) calendar days of receipt of a written demand thereof from NND stating that the Service Provider has failed to meet its obligations under the Contract. The Guarantor shall not go into the veracity of any breach or failure on the part of the Service Provider or validity of demand so made by NND and shall pay the amount specified in the demand, notwithstanding any direction to the contrary given or any dispute whatsoever raised by the Service Provider or any other Person. The Guarantor's obligations hereunder shall subsist until all such demands are duly met and discharged in accordance with the provisions hereof.

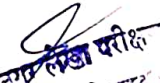
In order to give effect to this Guarantee, NND shall be entitled to treat the Guarantor as the Principal Debtor. The obligations of the Guarantor shall not be affected by any variations in the terms and conditions of the Contract or other documents or by the extension of time for performance granted to the Service Provider or postponement/non

  
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exercise/ delayed exercise of any of its rights by NND or any indulgence shown by NND to the Service Provider and the Guarantor shall not be relieved from its obligations under this Guarantee on account of any such variation, extension, postponement, non-exercise, delayed exercise of any of its rights by NND or any indulgence shown by NND, provided nothing contained wherein shall enlarge the Guarantor's obligation hereunder.

This Guarantee shall be irrevocable and shall remain in full force and effect until \_\_\_\_\_ unless discharged/ released earlier by NND in accordance with the provisions of the Contract. The Guarantor's liability in aggregate be limited to a sum of Rs. ....

3. This Guarantee shall not be affected by any change in the constitution or winding up of the Service Provider /the Guarantor or any absorption, merger, or amalgamation of the Service Provider /the Guarantor with any other Person. The Guarantor has power to issue this guarantee and discharge the obligations contemplated herein, and the undersigned is duly authorized to execute this Guarantee pursuant to the power granted under \_\_\_\_\_.

IN WITNESS WHEREOF THE GUARANTOR HAS SET ITS HANDS HEREUNTO ON THE DAY, MONTH AND YEAR FIRST HEREINABOVE WRITTEN.

SIGNED AND DELIVERED

by \_\_\_\_\_ Bank

by the hand of Shri \_\_\_\_\_

it's \_\_\_\_\_ and authorized official.

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### 13. PROJECT INFORMATION MEMORANDUM (PIM)

#### 13.1. ANNEXURE 1: Project Site Details

Description	Dumpsite Details		
ULB Name	NAGAR NIGAM DEHRADUN, Uttarakhand		
Existing Sanitary Landfill Site location	Danda Lakhaund, Shahastradhra Road, Dehradun (Old SWM dumpsite).		
Present Status	Dumping has been stopped since 2017 after commissioning of SWM Processing Plant at Sheeshambada.		
Geographical Coordinates	Latitude: 30°20'38.4 N Longitude: 78°04'36.8 E		
Start Year	-		
Area of the Old dumpsite covered under legacy waste / Waste Spread Area	Around 7.57 Ha (75,729 sqm)		
Total estimated legacy waste	Sr No.	Legacy waste	Quantum (in MT)
		Present waste	4,18,374 m3
	Total Waste required to be processed		4,18,374 m3

Detailed Quantification and Characterization of Stored waste at Danada Lakhaund, Shahastradhra, Dehradun (SWM old dumpsite report attached in the RFP).

  
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Geographical Coordinates	Lat: 30°20'38.4 N Long: 78°04'36.8 E
Area of the Old dumpsite covered under legacy waste.	Approx. 7.57Hectare (75729 sqm)
Total Waste required to be processed	4,18,374 m3



**उत्तराखण्ड  
UTTARAKHAND**



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**13.2. ANNEXURE 2: List of Approvals and Environmental Clearances –  
Indicative (For Reference Only)**


[To be updated by the Authority based on TFR. This list must be a part of RFP document and should be communicated to the bidders at the bidding stage]. As per the categorized legacy waste management projects categorization, the following conditions will be applicable:



[Note: These are applicable rules and regulations which Bidder is expected to comply with during the pre-operation, operational and post-operational period. ULBs can determine the applicability of these rules and regulations based on the local context]

The site remediation operations are expected to comply with minimum stipulated requirements as mentioned below:

Sr. No	Project Period	Applicable Legislation
1	Pre-Operational Period	Ambient Environment quality monitoring program and waste quantification and characterization study may be conducted to establish the baseline information.
2	Operational Period	<ul style="list-style-type: none"><li>— Consent to Operate.</li><li>— SWM Rules 2016</li><li>— Plastic Waste Mgt. Rules 2022</li><li>— E-Waste Rules 2016 &amp; applicable amendments.</li><li>— Hazardous waste Rules 2016</li><li>— Motor Vehicle Act provisions related to driving License applicable to operator &amp; vehicle fitness.</li><li>— Provisions to Labor Code 2020 (All)</li><li>— Explosive safety act provisions as per applicable storage of fuel at site.</li></ul>
3	Post-Operational period	Post Closure monitoring as per SWM Rules requirements for one year/based upon the minimum time duration suggested by SPCB/CPCB notified requirements in future.

  
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Additionally, depending upon scope of works, following code of practices and IS standards applicable to various operational aspects of project as applicable to equipment, utilities and testing protocols may also be considered for compliance:

General	
IS 3786: 1983	Methods for computation of frequency and severity rates for industrial injuries and classification of industrial accidents.
IS 5182: Part 1 to 21	Methods for measurement of Air Pollution
IS 8095: 1976	Specification for Accident Prevention Tags
IS 8990: 1978	Code of practice for maintenance and care of industrial safety clothing.
IS 9457: 1980	Safety colors and safety signs
IS 14489: 1998	Code of practice on occupational safety and health audit.
IS 45001: 2018	Occupational Health and Safety Management Systems – Specification with Guidance for use
SP 53: 1992	Hand operated hand tools – Safety code for the use, care, and protection
IS/ISO/IEC: GUIDE51	Guidelines for the inclusion of safety aspects in Standards 1990
Machinery / Operations	
IS 7194: 1994	Assessment of Noise Exposure during work for hearing conservation purpose
IS 8216: 1976	Guide for inspection of lift wire ropes
IS 8235: 1976	Guide for safety procedures in hand operated hand tools
IS 9474: 1980	Specification for principles of mechanical guarding of machinery
IS 10224: 1982	Ergonomic principles in the design of work systems
IS 11016: 1984	General safety requirements for machine tools and their operation.
IS 12735: 1994	Wire rope slings – safety criteria and inspection procedures for use
IS 13367: 1992 Part 1	Safe use of cranes – code of practice – General
IS 13583: 1993 Part 1	Cranes – Training of drivers: General
Electrical and Electronics	
IS 4691: 1985	Degrees of protection provided by enclosure for rotating electrical machinery.
IS 5572: 1994	Classification of hazardous areas (other than mines) having flammable gases and vapor for electrical installation.
IS 7577: 1986	Specification for Gas testing flame safety lamps
Transportation	
IS 4357: 1974	Methods for stability testing of forklift trucks
IS 6305: 1980 Part 1 & 2	Safety code for powered industrial trucks
IS 7155	Code of recommended practice for conveyor
Part 1 to 8	Safety
IS 7862: 1975	Glossary of terms relating to safety aspects concerning operating areas of industrial trucks.
IS 10311: 1982	General requirements of powered platform trucks and their acceptance criteria
IS 10312: 1982	Safety code for powered tow trucks

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IS 12009: 1995	Automotive vehicle – safety requirements for side door of passenger cars – recommendations
IS 12056: 1987	Recommendations for safety requirements for fuel tank assembly of automotive vehicles.
IS 13944: 1994	Automotive vehicles – window retention and release systems for buses - safety requirements
IS 14283: 1995	Automotive vehicles – accelerator control systems - safety requirements
IS 14665: 2000 Part 1	Electric traction lifts – guidelines for outline dimensions of passenger, goods, service, and hospital lifts.
IS 15139: 2002	Automotive vehicles – safety belt anchorages – specification
IS 15140: 2003	Automotive vehicles – safety belt assembly – specification
<b>Civil Engineering Construction</b>	
IS 3764: 1992	Code of safety for excavation work
IS 4082: 1996	Recommendations on stacking and storage of construction materials and components at site.
IS 13416: 1992 Part 1	Recommendations for preventive measures against hazards at workplaces – Falling material hazards prevention
<b>Chemicals and other hazardous materials</b>	
IS 1260: 1973 Part 1	Pictorial marking for handling and labeling of goods – Dangerous goods
IS 1446: 2002	Classification of dangerous goods
IS 4015: 1998	Guide for handling cases of pesticide poisoning
IS 11451: 1986	Recommendations for safety and health requirements relating to occupational exposure to asbestos
IS 11457: 1985 Part 1	Code of practice for fire safety of chemical industries: Rubber and plastic
<b>Fire Protection</b>	
IS 2189: 1999	Selection, installation and maintenance of automatic fire detection and alarm system code of practice
IS 2190: 1992	Selection, installation, and maintenance of first aid fire extinguishers - code of practice
IS 3016: 1982	Code of practice for fire precautions in welding and cutting operations
IS 5896: 1970 Part 1	Code of practice for selection, operation, and maintenance of special firefighting appliance – combined foam and co crash tender
IS 6382: 1984	Code of practice for design and installation of fixed carbon di oxide fire extinguishing system.
IS 8757: 1999	Glossary of terms associated with fire safety
IS 9668: 1990	Code of practice for provision and maintenance of water supplies and fire fighting
<b>Personal Protection Body</b>	
IS 3521: 1999	Industrial safety belts and harnesses – Specification
IS 4501: 1981	Specification for aprons, rubberized, acid and alkali resistant
IS 6153: 1971	Specification for protective leather clothing
IS 7352: 1974	Specification for X-ray lead rubber protective aprons

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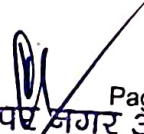
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IS 8519: 1977	Guide for selection of industrial safety equipment for body protection
IS 8990: 1978	Code of practice for maintenance and care of industrial safety clothing
<b>Ears</b>	
IS 6229: 1980	Method for measurement of real ear protection of hearing protectors and physical attenuation of earmuffs
IS 8520: 1977	Guide for selection of industrial safety equipment for eye, face, and ear protection
IS 9167: 1979	Specification for ear protectors
<b>Eyes &amp; Face</b>	
IS 1179: 1967	Equipment for eye and face protection during welding
IS 5983: 1980	Eye protectors
IS 7524: 1980 Part 1	Method of test for eye protectors: - non-optical tests
IS 8521: 1977 Part 1	Industrial safety face shields – with plastic visor
IS 8521: 1994 Part 2	Industrial safety face shields – with wire mesh visor
IS 8940: 1978	Code of practice for maintenance and care of industrial safety equipment for eyes and face protection
IS 9973: 1981	Specification for visor for scooter helmets
IS 9995: 1981	Specification for visor for non-metal police and firemen's helmets
IS 14352: 1996	Miners' safety goggles – Specification
<b>Feet and Legs</b>	
IS 1989: 1986 Part 1	Specification for leather safety boots and shoes – for miners
IS 1989: 1986 Part 2	Specification for leather safety boots and shoes – for heavy metal industries
IS 3737: 1966	Leather safety boots for workers in heavy metal industries
IS 3738: 1998	Rubber boots – Specification
IS 3976: 2003	Protective rubber canvas boots for miners – Specification
IS 4128: 1980	Specification for fireman's leather boots
IS 5557: 1999	Safety Rubber boots – Specification
IS 5852: 1996	Protective steel toe caps for footwear – Specification
IS 6519: 1971	Code of practice for selection, care, and repair of safety footwear
IS 7329: 1974	Metal last for safety rubber canvas ankle boots
IS 10348: 1982	Safety footwear for steel plant
IS 10665: 1982	Safety rubber ankle boots for miners
IS 10667: 1983	Guide for selection for industrial safety equipment for protection of foot and leg
IS 11225: 1985	Leather safety shoes for women workers in mines and steel plants
IS 11226: 1993	Leather safety footwear having direct molded rubber sole – Specification
IS 11264: 1985	Code of practice for manufacture of safety rubber footwear for miners
IS 13295: 1992	Code of practice for manufacture of leather safety boots and shoes for workers in mines and heavy metal industry
IS 14544: 1998	Leather safety footwear with direct molded PVC soles – Specification
IS 15298: 2002 Part 2	Safety, protective and occupational footwear for professional use – Specification for safety footwear


  
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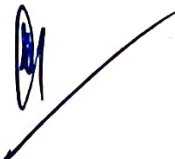


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<b>Hands</b>	
IS 2573: 1986	Specification for leather gauntlets and mittens
IS 4770: 1991	Rubber Gloves – electrical purposes – specification
IS 6994: 1973 Part 1	Specification for safety gloves – leather and cotton gloves
IS 8807: 1978	Guide for selection of industrial safety equipment for protection of arms and hands
<b>Head</b>	
IS 2745: 1983	Specification for non-metal helmet for firefighters and civil defense personnel
IS 2925: 1984	Specification for industrial safety helmets
IS 4151: 1993	Specification for protective helmets for scooter and motorcycle riders
<b>Respiratory</b>	
IS 8318: 1977	Color identification markings for air purifying canisters and cartridges
IS 8347: 1977	Glossary of terms relating to respiratory protective devices
IS 8522: 1977	Respirators, chemical cartridge
IS 8523: 1977	Respirators, canister type (gas masks)
IS 9473: 2002	Respiratory protective devices – Filtering half masks to protect against particles – specification
IS 9563: 1980	Carbon monoxide filter self-rescuers
IS 9623: 1980	Recommendations for the selection, use and maintenance of respiratory protective devices
IS 10245: Part 1 to 46	Breathing apparatus
IS 15322: 2003	Particle filters used in respiratory protective equipment – Specification
IS 15323: 2003	Gas filters and combined filters used in respiratory protective equipment – Specification
<b>Other</b>	
IS 5424: 1969	Specification for rubber mats for electrical purpose
IS 6685: 1972	Specification for life jackets
IS 10592: 1982	Specification for industrial emergency showers, eye and face fountains and combination units
IS 11057: 1984	Specification for industrial safety nets
IS 12078: 1987	Recommendations for personal protection of workers engaged in handling asbestos

  
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**13.3. ANNEXURE 3: Documents to be submitted with Monthly Progress Report**

CHECKLIST FOR MONTHLY PROGRESS REPORT		
Sr. No	Particulars	Remark
1	Invoice	Copy to be attached
2	Logbook of Bioremediation and Bio-mining	In bio-remediation Windrow formation data And in Biomining Treatment like RDF, INERT, Compost, C&D.
3	Weighment Slip Processing	RDF, inert, C&D, Compost
4	Agreement With Cement Plant	Copy of Agreement to be attached
5	Agreement With Villagers for disposal	Like: - NOC, Aadhar card, Agreement, COR
6	Co-Processing Certificate of RDF	Copy of Certificate to be attached
7	GPS Details each Vehicle in KML Format	RDF, inert, C&D, Compost
8	Summary of each Fraction Generated and Dispose	Copy of Summary sheet to be attached
9	Calibration Certificate of Weigh Bridge	Copy of Certificate to be attached
10	Test Report of each Fraction	Ground water, Soil, C&D, RDF
11	Contour Survey: Initial and Final Yard Area	Copy to be attached
12	Contour Survey: Initial and Final Disposal Area	Copy to be attached
13	Photos of Each Activity	Excavation of waste, windrow making, Spray Bio-culture, Turning of windrow
14	Correspondence B/W both Parties	Copy to be attached
15	Agreement and Work order of Bidder	Copy to be attached
16	IAA Assessment Report & compliances of pre-observation	From IIT, JE will do that
17	Leachate Treatment Report or Shifting Details of Leachate water	Copy to be attached
18	Test report of Bulk Density of legacy waste	Copy to be attached
19	Volume Report of waste Processed at site	Copy to be attached
20	Chalan Signed by NND Officials for Disposal of Fractions	Copy to be attached
21	Receiving From Cement Plant for Disposal of RDF	Copy to be attached

  
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13.4. ANNEXURE 4 - Characterization and Quantification of Stored Waste  
at Danda Lakhaund dumpsite

Attached

  
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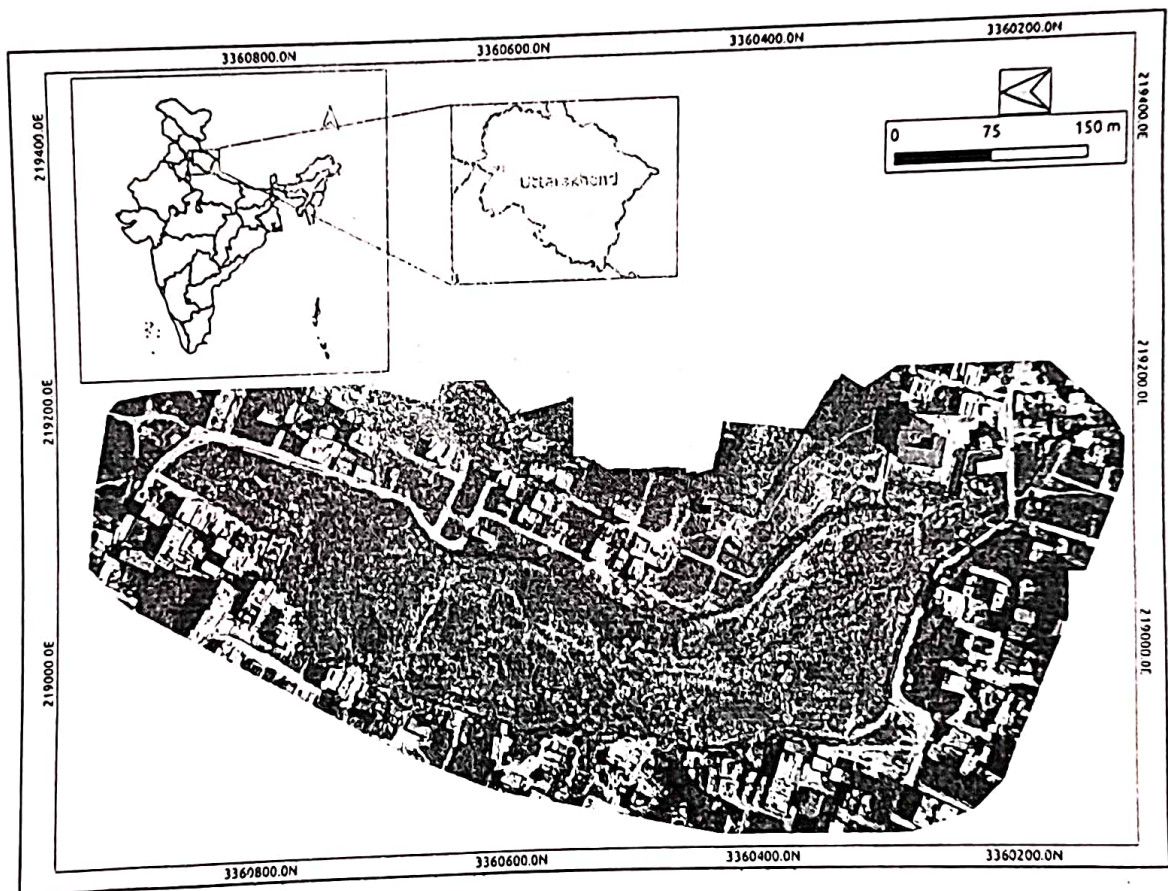
  
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# PART A: QUANTIFICATION OF STORED WASTE AT DANDA LAKHOUND SOLID WASTE DUMPSITE, DEHRADUN

Submitted to  
Municipal Corporation, Dehradun



November 2023  
Department of Civil Engineering  
IIT Roorkee-247667




## EXECUTIVE SUMMARY

The Municipal Corporation, Dehradun, is going to initiate bioremediation of legacy waste at the dumpsite of Danda Lakhond, Dehradun.

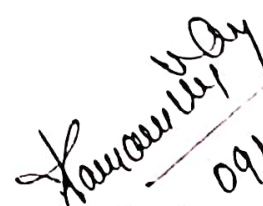
Given the above, Dehradun Municipal Corporation requested IIT Roorkee for the quantification and characterization of stored waste at the Danda Lakhond solid waste dumpsite.

By using drone surveying and garbage core drilling the mass of the legacy waste at the dumpsite in Dehradun, Uttarakhand, on 4<sup>th</sup> and 5<sup>th</sup> November 2023 was estimated to be 41,83,74,257 Kg (418,374 metric tonnes).

  
A. A. Kazmi

November 2023

DR. ABSAR AHMAD KAZMI  
PROFESSOR  
DEPARTMENT OF CIVIL ENGINEERING  
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE  
ROORKEE-247667, UTTARAKHAND (INDIA)

  
Saurabh Vijay  
09/11/2023

## 1. METHODOLOGY

Data	Purpose
Drone Images	To Generate a Digital Surface Model and Image Mosaic of the dumpsite
GPS Data	To Geotag the Drone Images.
Garbage Core Drilling	To estimate the garbage density profiles and conversion from volume to the mass of the garbage.

A survey was conducted at the dumpsite near Danda Lokhand Dumpsite in Dehradun, Uttarakhand, on the 4<sup>th</sup> and 5<sup>th</sup> of November, 2023. The survey was based on initial reconnaissance followed by a drone survey and garbage core drilling. The drone survey (plane height 70 m from the ground) was planned over the dumpsite, additionally covering a surrounding area of approximately 2,16,100 sq. meters (Figure 1). The actual dumpsite area was approximately 70,000 sq. meters. Additionally, the survey team dug the ground at multiple locations to estimate the garbage's density profile and determine the waste's depth beneath the surface. These combined efforts aimed to gather comprehensive information about the dumpsite in Dehradun, Uttarakhand.

Multiple drone images were adjusted using the photogrammetry technique, which resulted in the generation of an image mosaic (Figure 2) and digital surface model.

The locations with trees, structures, vehicles and water bodies were eliminated from the assessment. The survey team dug the garbage piles at multiple locations to measure the density profile of the garbage with depths (sampling point locations are shown in Figure 3(a)).

We have divided the complete Area of Interest (AOI) into Five sections based on the sampling point. Mass estimation was universally applied in our assessment to determine the garbage heights; separate reference points for each section on the most suitable place (e.g. roads, soil-covered grounds, etc.) were considered. Figure 3(b) shows the garbage height.



Part -A Quantification of Stored Waste at Danda Lakhound Solid Waste Dumpsite, Dehradun

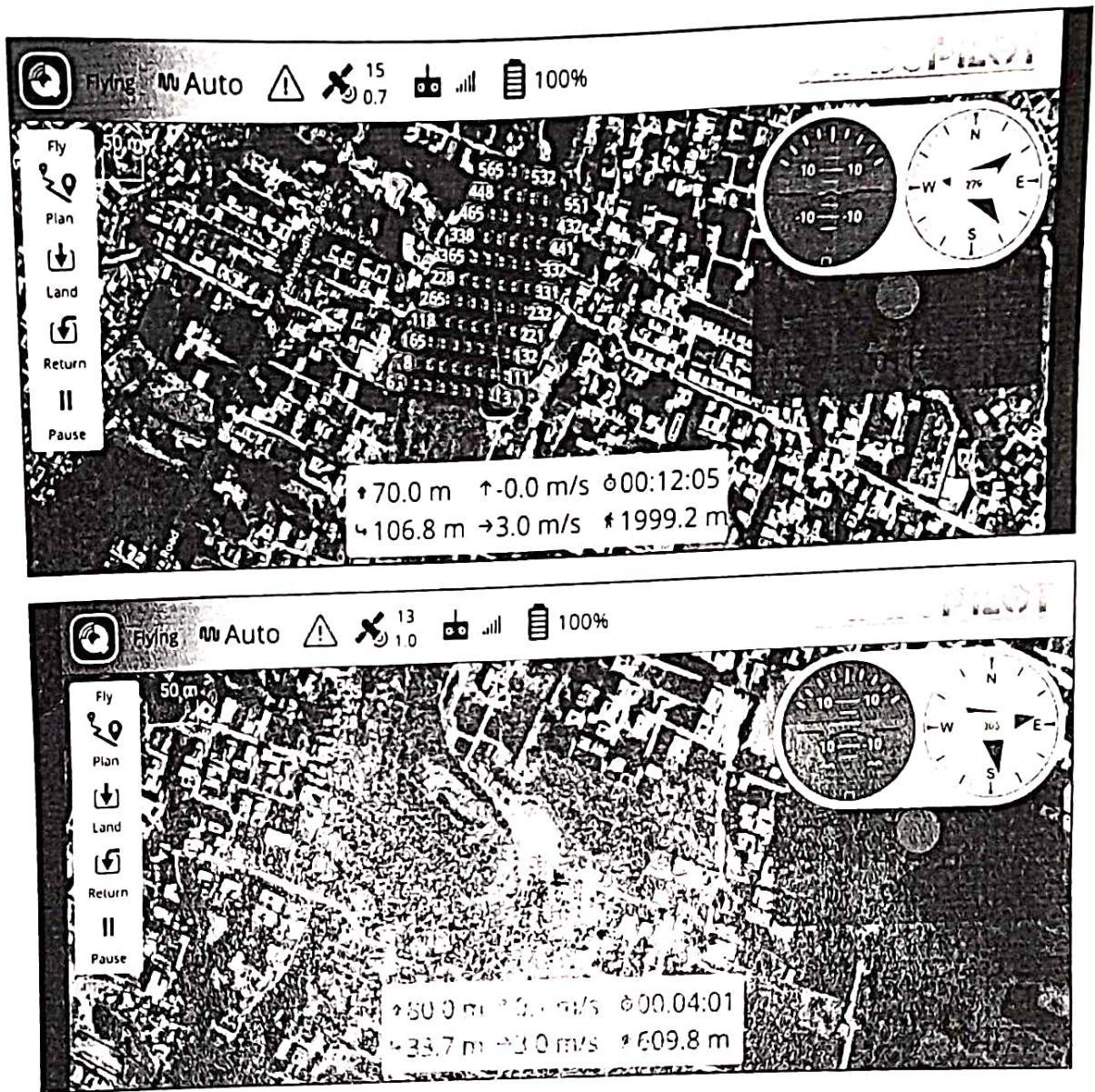


Figure 1: Drone Flight Plan for the Garbage Dumpsite



Part -A Quantification of Stored Waste at Danda Lakhound Solid Waste Dumpsite, Dehradun

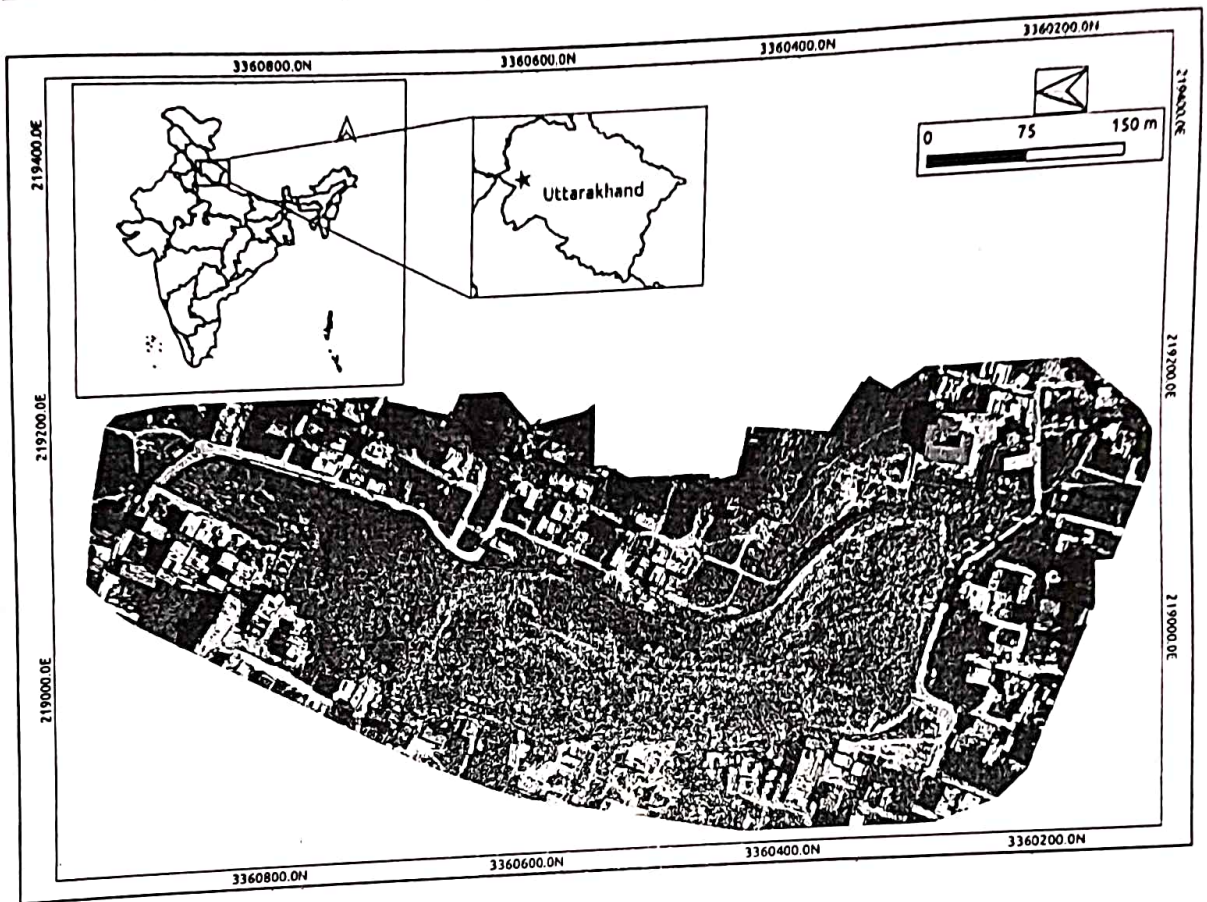


Figure 2: Orthomosaic generated from Drone Images

Department of Civil Engineering, IIT Roorkee

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INDIAN INSTITUTE OF TECHNOLOGY  
ROORKEE-247667, UTTARAKHAND (INDIA)

Part -A Quantification of Stored Waste at Danda Lakhound Solid Waste Dumpsite, Dohradun

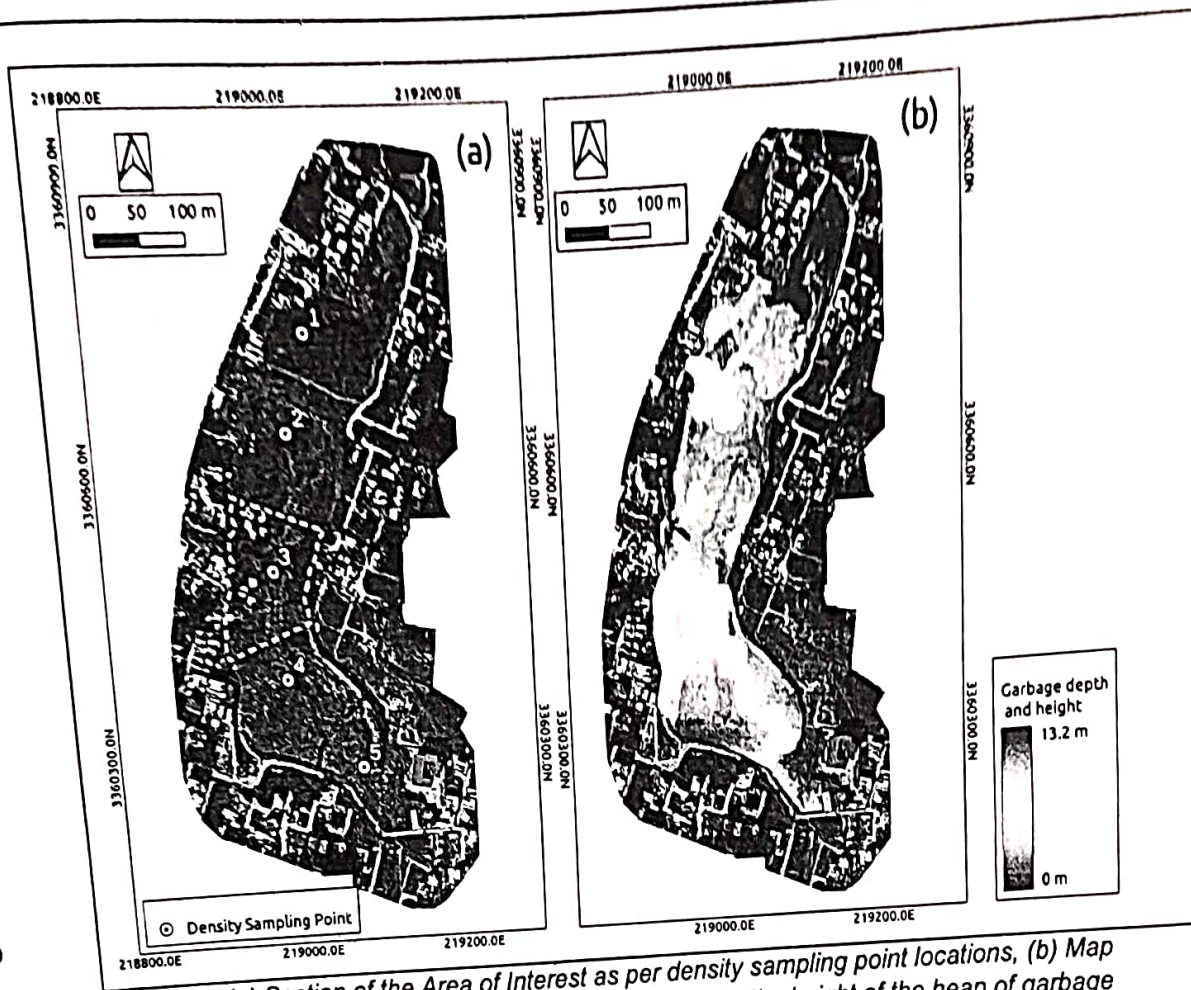


Figure 3: (a) Section of the Area of Interest as per density sampling point locations, (b) Map showing the Height the nearest ground-level representing the height of the heap of garbage

## 2.0 RESULTS

1. **Garbage height:** Figure 3(b) shows the garbage height above the reference ground (soil surface), which varies throughout the area.
2. **Garbage area and volume:** The volume of the garbage was determined by considering all the points of the garbage dumpsite and varying garbage height for each sub-section (e.g. S1, S2, S3, S4, S5). We also consider the garbage below the reference soil surface, as observed during the field survey.
3. **The team considered different garbage density scenarios depending on height:** In each section, we conducted three density measurements at different depths: one at 1 meter, another at 2 meters, and the last at 3 meters. We continued digging at each sampling point until we reached a point where there was no further material to excavate. This allowed us to determine the maximum depth at each sampling point. We then assumed that this maximum depth was consistent across all sections.

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Part -A Quantification of Stored Waste at Danda Lakhound Solid Waste Dumpsite, Dehradun

We calculated the average density of the garbage from the top of the heap to a depth of 1 meter by averaging the density values obtained from all five sampling points within this 1-meter depth (variation from 958 kg/m<sup>3</sup> to 1050 kg/m<sup>3</sup>). For the garbage between depths of 1 meter and 2 meters, we derived a single density value by averaging the measurements from all sampling points within this range (variation from 980 kg/m<sup>3</sup> to 1210 kg/m<sup>3</sup>). Lastly, for all garbage below a depth of 2 meters, we used a single density value obtained by calculating the average density from samples taken at depths of 3 meters or more. variation from 1110 kg/m<sup>3</sup> to 1234 kg/m<sup>3</sup>)

Table 1: Garbage Area, volume and mass for the Dehradun dumping site

Sections	Area(m <sup>2</sup> )	Volume (m <sup>3</sup> )	Estimated Mass (kg)
1	14840	113413	122772552
2	17013	59907	64407495
3	12995	91663	109215675
4	15584	88867	100789691
5	10189	20562	21188844
Total	70,621	3,74,412	41,83,74,257

The estimated Total Volume and Mass are 374,412 m<sup>3</sup> and 418,374.257 Metric Tons respectively.

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ROORKEE



# PART-B: CHARACTERIZATION OF STORED WASTE AT DANDA LAKHOUND SOLID WASTE DUMPSITE, DEHRADUN

Submitted to  
Municipal Corporation, Dehradun



November 2023  
Department of Civil Engineering  
IIT Roorkee-247667

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## EXECUTIVE SUMMARY

The Municipal Corporation, Dehradun, is going to initiate bioremediation of legacy waste at the dumpsite of Danda Lakhond, Dehradun.

Given the above, Dehradun Municipal Corporation requested IIT Roorkee for the quantification and characterization of stored waste at the Danda Lakhond solid waste dumpsite.

1. Component Characterization of waste at FIVE locations and THREE different depths reveals that.
  - a. Plastics including Polythene: 19.2-49.6 %
  - b. Cloth: 0-14.7 %
  - c. Glass: 0-3.9 %
  - d. C&D: 3.1-13.3%
  - e. Wood: 0-4.3 %
  - f. Wood: 0.9-4.4 %
  - g. Soil or Fine fraction: 30.9-70.5 %
2. The average in-situ density varies from 1040-1134 kg/m<sup>3</sup> from 1-3 m depth. Moisture content: 18-36.9%, and particle size distribution of >80mm: 8.2-22.5%, 30-80mm 11.3-53.6%, 4-30mm 21.6-48% and <4mm: 7.8-45% from 1-3m depth in five locations.
3. The analysis results of fraction of >30mm for calorific value (Dry Basis), moisture content, Ash content and Sulfur content shows 1850.7-2840 kCal/kg, 7.5-32%, 30.1-59.1% and 0.21-0.49% respectively.
4. Most of the parameters of fine fraction (<4mm) of solid waste satisfy all parameters of FCO Standards except some heavy metals (Cr, Pb, & Cu.). However, it satisfies US EPA Class A, Biosolids Heavy metal limits.

  
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*Part -B Characterization of Stored Waste at Danda Lakhound Solid Waste Dumpsite, Dehradun*

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## 1.0. INTRODUCTION

The Municipal Corporation, Dehradun, is going to initiate bioremediation of legacy waste at the dumpsite of Danda Lakhound, Dehradun.

Given the above, Dehradun Municipal Corporation requested IIT Roorkee for the quantification and characterization of stored waste at the Danda Lakhound solid waste dumpsite. The detailed Google Earth image and pictorial view of the solid waste dumpsite are given in Figures 1 and 2.



Figure 1. Google Earth image showing solid waste dumpsite at Danda Lakhound, Dehradun

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Part -B Characterization of Stored Waste at Danda Lakhound Solid Waste Dumpsite, Dehradun

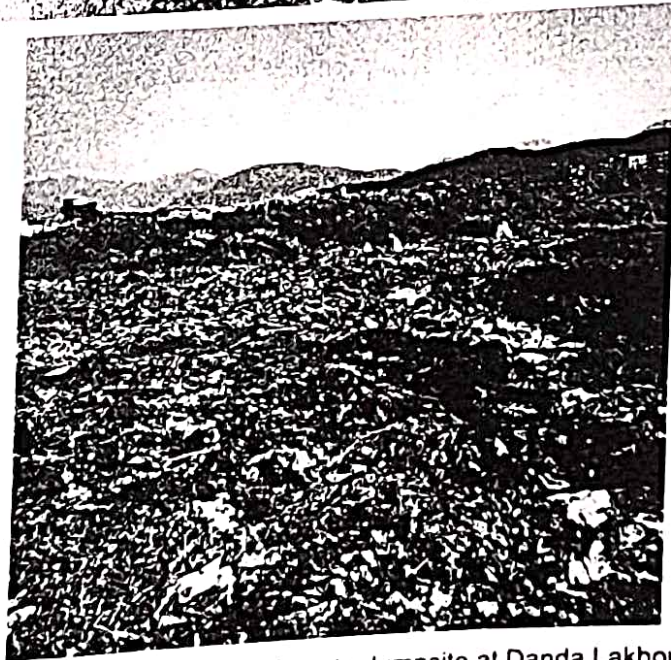
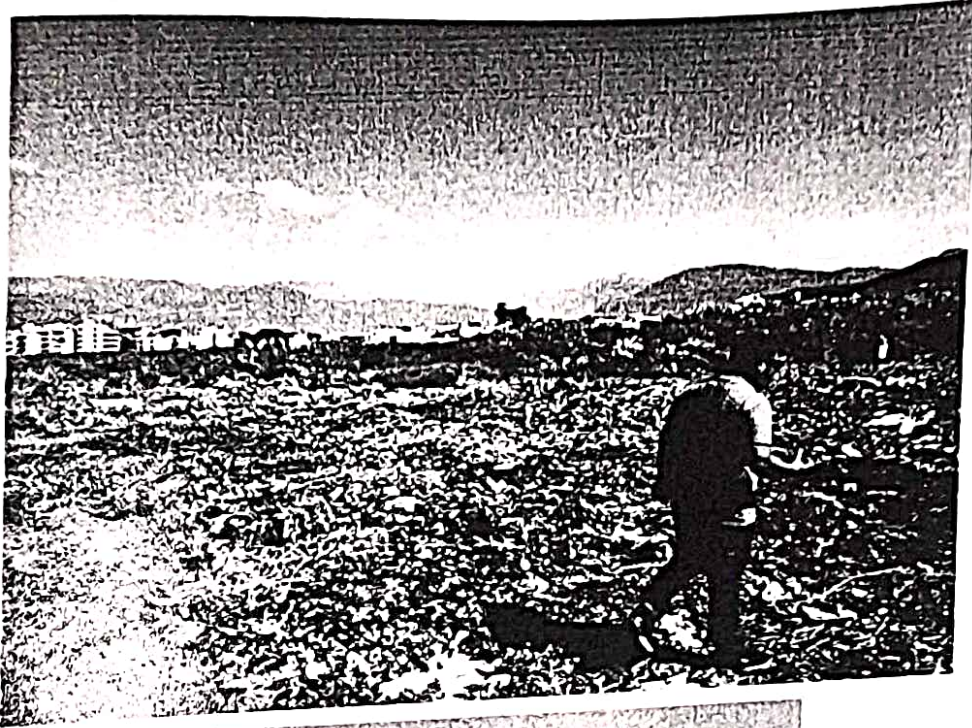


Figure 2. Pictorial view solid waste dumpsite at Danda Lakhound

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## 2.0. SCOPE OF WORK

Scope of work of part B of the project are as follows:

- Sampling of waste at five locations at three different depths. (Total 15 samples)
- Analysis of 15 Samples for characteristics/Components such as Textile, wood, Rubber, Leather, metal Glass, C&D Fine fraction etc.
- Analysis of 15 samples for Bulk density, moisture contents, and size distribution
- Analysis of 15 samples of larger fractions, i.e., >30 mm for calorific value, Moisture Content, Ash Chlorine, and Sulphur.
- Analysis of 15 samples of fine fraction, i.e., < 4 mm Fraction.

## 3.0 METHODOLOGY

### 3.1 Sampling and analysis for solid waste characterization

The samples from five locations from 1 m interval depth (0-1 m, 1-2 m, 2-3 m) were collected using a JCB excavator from dumpsite. More than 300 kg of samples from the dumpsite's top layer (~1 m) were collected. Two excavator bucket worth of waste was collected separately to maintain homogeneity in analysis after reaching the required depth. The oversized particles and big debris were removed, and the waste accounted was approximately 60-80 kg in most cases for one depth and 180-240 kg in one location. The waste composition in the samples was determined onsite by manually separating the samples into different categories using coning and quartering methods. Google maps showing sampling locations and photos of waste excavation and sampling along with coordinates are given in Figures 3 and 4.

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Part -B Characterization of Stored Waste at Danda Lakhound Solid Waste Dumpsite, Dehradun

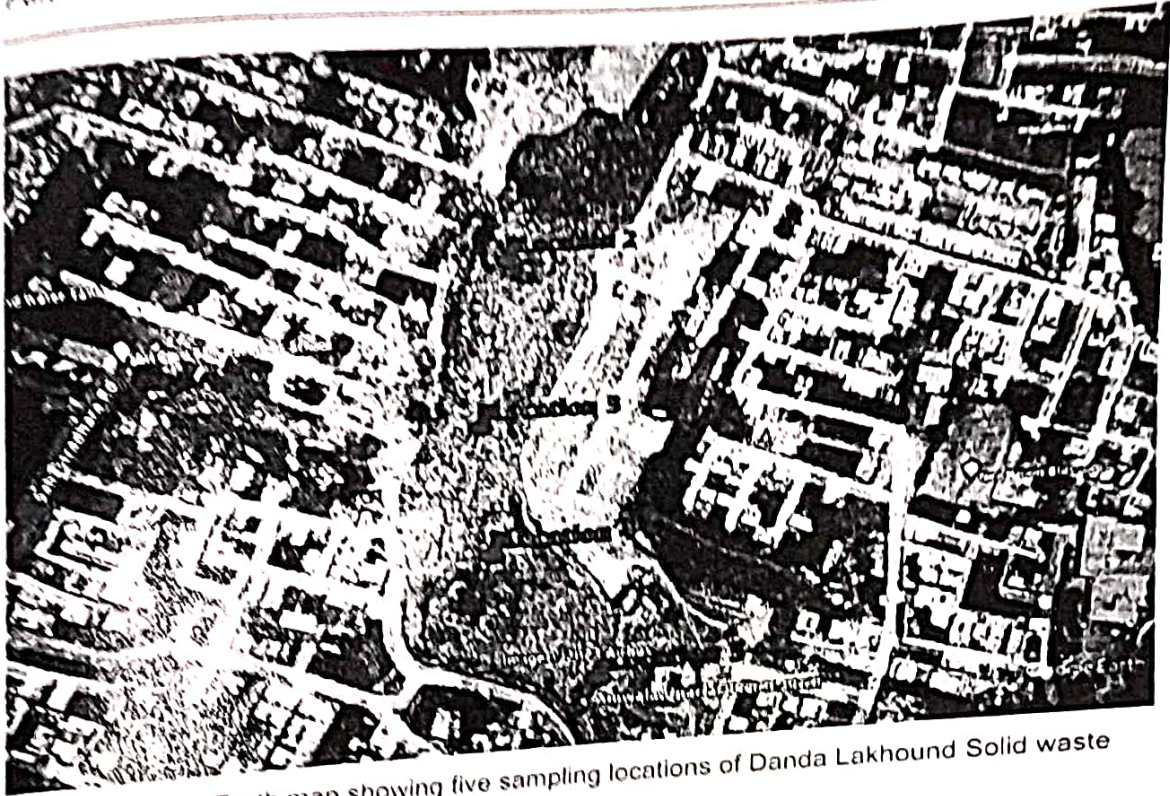


Figure 3. Google Earth map showing five sampling locations of Danda Lakhound Solid waste dumpsite, Dehradun

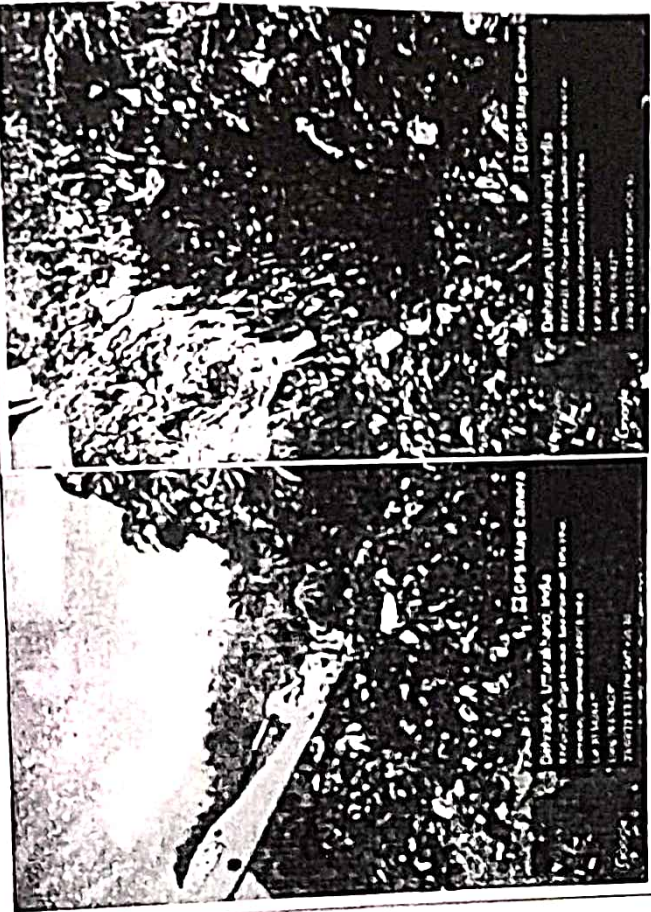
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Part - B Characterization of Stored Waste at Danda Lakhound Solid Waste Dumpsite, Dehradun

S. No.	Sampling location	Coordinates	Photographs
1.	Location 1	30°20'45.60" N 78°04'45.60" E	

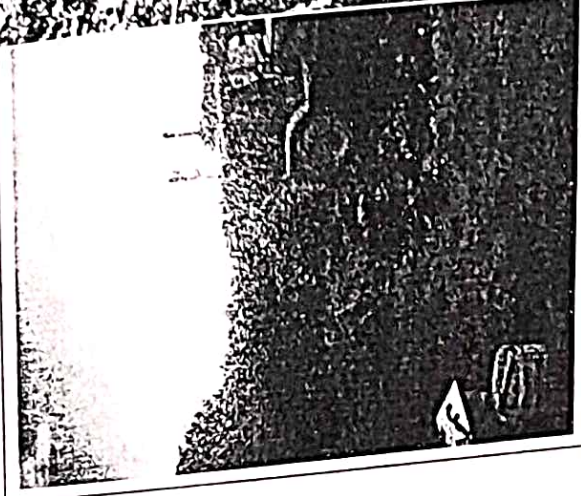
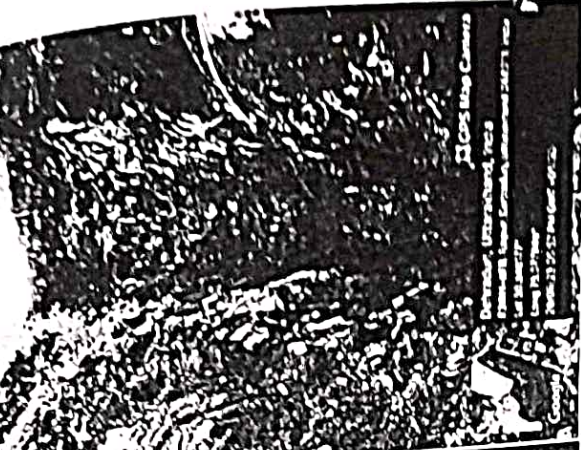
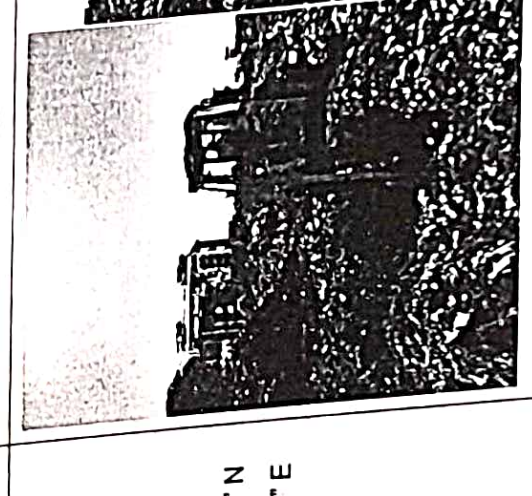
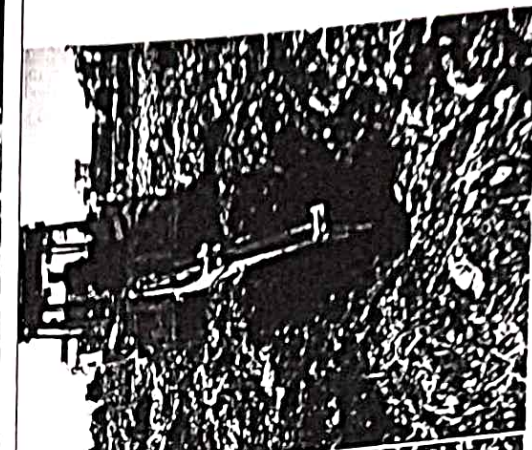
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Part - B Characterization of Stored Waste at Danda Lakhound Solid Waste Dumpsite, Dehradun

2. Location 2		
3. Location 3		

30°20'42.26" N  
78°04'37.49" E

30°20'37.57" N  
78°04'36.61" E

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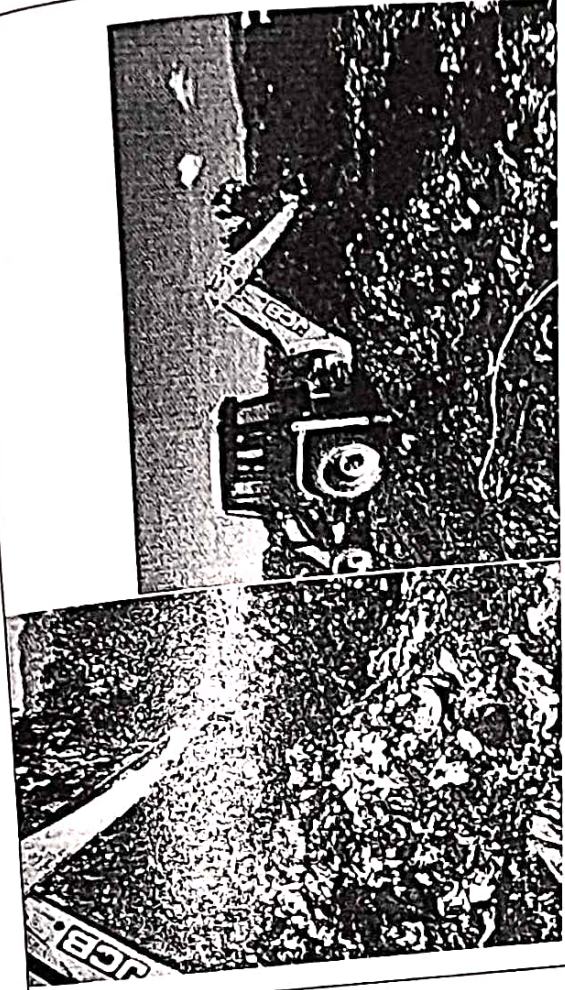
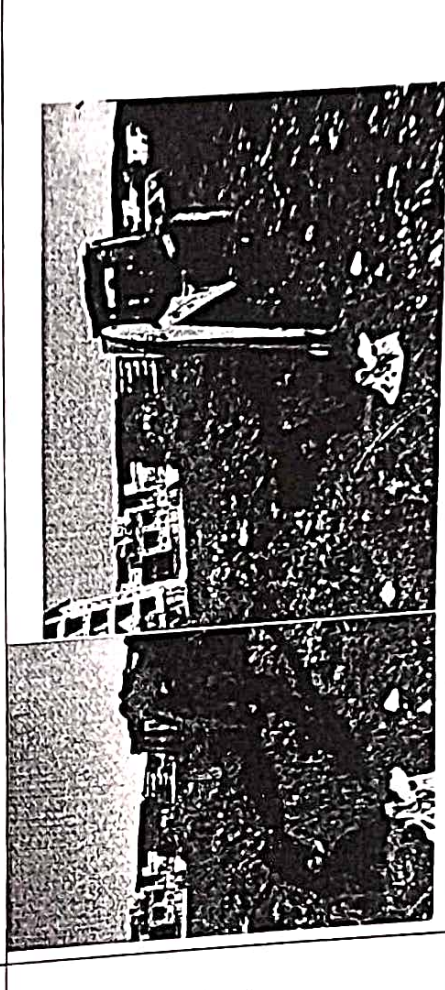
4.	Location 4	$30^{\circ}20'33.74''$ N $78^{\circ}04'37.07''$ E	
5.	Location 5	$30^{\circ}20'30.58''$ N $78^{\circ}04'40.28''$ E	

Figure 4. Pictorial view of sampling locations along with coordinates

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part -B Characterization of Stored Waste at Danda Lakhound Solid Waste Dumpsite, Dehradun



Figure 5. Sampling and onsite characterization of solid waste

## Part -B Characterization of Stored Waste at Danda Lakhound Solid Waste Dumpsite, Dohradun

### 3.2 Sampling and Analysis of 15 samples for Bulk density, moisture contents, and size distribution

At least five kg of homogeneous samples of depths from 1m to 3 m from different locations were collected in plastic bags and transported to the laboratory at IIT Roorkee to analyze Density, Moisture content, and size distribution for >80mm, 30-80mm, >30mm, 4-30mm and <4mm, respectively.

### 3.3. Sampling and Analysis of 15 samples of larger fractions, i.e., >30 mm for calorific value, Moisture Content, Ash, and Sulphur.

EPA 600/4-79-020 methods were used for chemical analysis of solid waste, such as Calorific value, Moisture content Ash content and Sulfer content of solid >30mm fraction of solid waste sample.

### 3.4. Sampling and Analysis of 15 samples of fine fraction, i.e., < 4 mm Fraction

Screened fine fractions from five kg of homogeneous samples were used for the analysis of physicochemical parameters Color, Odor, pH, E.C., Moisture content, Particle size, Bulk density, Volatile solids, Ash content, Total organic carbon, CHNS, T.P., K, C.N. ratio and heavy metals, respectively and compared with FCO (2009) compost standards. The results are presented in Table 4.

## 4.0 RESULTS AND DISCUSSION

### 4.1. Depth and In-situ density profile

Table 1 shows the results of the depth and in-situ density profile of locations 1-5. The depth from locations 1-5 of dumpsite was found to be 6.25, 4.50, 7.56, 6.25 and 4.50m respectively, whereas in-situ density from 1m to 3 m depth of locations 1-5 was 970-1110, 1040-1160, 958-1334, 1050-1158, 980-1150 kg/m<sup>3</sup> respectively. The average in-situ density of all five locations was 1040-1134 kg/m<sup>3</sup>.

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Part-B Characterization of Stored Waste of Danda Lakhound Solid Waste Dumpsite, Dehradun

Table 1. Depth and Density Profile of Danda Lakhound Dumpsite Dehradun

S. No.	Locations	Coordinates	Maximum Depth (m)	In-situ Density (kg/m <sup>3</sup> )		
				1m	2 m	3 m
1.	Location 1	30°20'45.60" N 78°04'45.60" E	6.25	970	1040	1110
2.	Location 2	30°20'42.26" N 78°04'37.49" E	4.50	1040	980	1160
3.	Location 3	30°20'37.57" N 78°04'36.61" E	7.56	958	1210	1234
4.	Location 4	30°20'33.74" N 78°04'37.07" E	6.25	1050	1130	1158
5.	Location 5	30°20'30.58" N 78°04'40.28" E	4.50	980	1090	1150

4.2. Characterization of Solid Waste of dumpsite from locations 1-5 and depth 1-3m

The material excavated from different depths was observed that Plastics 25.3, 32.4, & 21.2% from 1m to 3m in location 1, 25.3, 33.8, & 32.8% at location 2, 32.8, 35.5, & 46.0% at location 3, 48.8, 40.6 & 31.1% in location 4 and 21.5, 19.2, & 23.0% in location 5 respectively. Cloths, 4.0, 7.4, & 15% from 1m to 3m in location 1 whereas 14.7, 6.9, & 13.9% at location 2, 2.4, 6.5 & 0.0% in location 3, 4.0, 11.5, & 6.4% in location 4 and 3.8, 3.8 & 4.6% in location 5 respectively. Glass, 1.5, 3.5 & 2.3% at locations 1, 1.0, 3.9 & 0% at location 2, 1.3, 1.3, & 1.5% at location 3, 0.8, 0.4 & 0.5% in location 4, and 0.8% in location 5, respectively. The C&D waste was 3.7, 7.1 & 4.1% at location 1, 3.9, 7.7, & 4.0% at location 2, 4.4, 10.5, & 4.5% at Location 3, 3.1, 7.5, & 8.8% at location 4 and 8.5, 6.5, & 13.3% at location 5 respectively. Wooden material in the legacy waste was 1.2, 3.9 & 3.4% at Location 1, 0.6, 3.9, 2.9% at Location 2, 1.2, 3.3, 3.2% at Location 3, 1.9 & 4.3% at location 4 and 0.8, & 2.4% at location 5 respectively. However, Soil fraction of the size <math>4-30\text{mm}</math> was found to be 64.1, 45.6, & 54.6% at location 1, 54.6, 43.8, & 49.8% at location 2, 58.0, 42.8 & 44.8% at location 3, 41.8, 30.9, & 62.5% at location 4 and 62.5, 70.5 & 56.6% at location 5 respectively. The average waste composition of Plastics, Cloths, C&D, Glass, Wooden material, and fine fraction at all locations from 1m to 3 m depth was found to be 31.8, 6.1, 6.5, 1.3, 2.2 and 52.2% respectively (Table 2).

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Table 2. Characterization of solid waste for locations 1-5 and depth 1-3m

Components	Location 1			Location 2			Location 3			Location 4			Location 5		
	1 m	2 m	3 m	1m	2m	3m	1m	2m	3m	1m	2m	3m	1m	2m	3m
Plastics	25.3	32.4	21.2	25.3	33.8	29.4	32.8	35.5	46.0	48.3	49.6	31.1	23.5	19.2	23.0
Cloth	4.0	7.4	1.5	14.7	6.9	13.9	2.4	6.5	0.0	4.0	11.5	6.4	3.8	3.8	4.6
C&D	3.7	7.1	4.1	3.9	7.7	4.0	4.4	10.5	4.5	3.1	7.5	8.8	8.5	6.5	13.3
Glass	1.5	3.5	2.3	1.0	3.9	0.0	1.3	1.3	1.5	0.8	0.4	0.5	0.8	0.0	0.0
Wood	1.2	3.9	3.4	0.6	3.9	2.9	1.2	3.3	3.2	1.9	0.0	4.3	0.8	0.0	2.5
Soil Fraction	64.2	45.6	67.4	54.6	43.8	49.8	58.0	42.8	44.8	41.8	30.9	49.0	62.5	70.5	56.6

4.3. Results of Bulk density, moisture content, and size distribution of solid waste

Table 3 shows the test results of bulk density, moisture content, and size distribution for >80mm, 30-80mm, >30mm, 4-30mm and <4mm fractions. The bulk density varies from 395-644 kg/m<sup>3</sup> from 1-3m depth, Moisture content: 18-36.9%, and size distribution of >80mm: 8.2-22.5%, 30-80mm 11.3-53.6%, 4-30mm 21.6-48% and <4mm: 7.8-45% from 1-3m depth in five locations respectively.

Table 3. Results of Bulk density, moisture contents, and size distribution of solid waste from depth 1-3m for locations 1-5

Parameters	Unit	Location 1			Location 2			Location 3			Location 4			Location 5		
		1m	2m	3m	1m	2m	3m	1m	2m	3m	1m	2m	3m	1m	2m	3m
Bulk Density	kg/m <sup>3</sup>	530	555	644	496	494	530	395	490	434	501	454	568	570	434	550
Moisture content	%	31.1	36.9	34	32.1	25.75	28	18	30	26	24	18	32	28	26	24
Particle Size	>80 mm	18.4	14.2	13.8	21.0	8.2	10.8	10.0	15.6	9.2	22.4	17.0	15.0	15.8	22.5	21.0
	30-80 mm	25.6	17.0	24.0	16.0	13.4	12.2	18.4	27.4	21.3	24.0	53.6	23.0	27.3	11.3	23.2
	4-30 mm	43.4	44.2	38.6	31.8	42.4	41.0	26.0	26.8	47.6	33.4	21.6	48.0	32.0	34.2	38.0
	<4 mm	12.4	24.2	22.4	30.2	36.0	36.0	45.0	29.8	21.6	20.2	7.8	13.6	24.9	32.0	17.6

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4.4. Results of larger fractions, i.e., >30 mm for calorific value, Moisture Content, Ash Chlorine, Sulphur of solid waste fraction of size >30mm from depth 1-3m for locations 1-5.

Table 4 shows the results of calorific value moisture content, Ash content, and sulfur content in the fraction >30mm of solid waste of location 1-5 and depth 1m-3m respectively. The range of calorific value, moisture content, ash content and sulfur content of solid waste fraction of size >30mm from 1m to 3m depth was found to be 1850.7-2840 kcal/kg, 7.5-32%, 30.1-59.1%, 0.2-0.49% respectively.

Table 4. Results of calorific value, Moisture Content, Ash content, and Sulphur of the solid waste fraction of size >30mm from depth 1-3m for locations 1-5.

Parameters	Unit	Location 1			Location 2			Location 3			Location 4			Location 5		
		1m	2m	3m	1m	2m	3m	1m	2m	3m	1m	2m	3m	1m	2m	3m
Calorific Value	kcal/kg	2120.5	2005.7	1850.7	2504	2308	2050	2840	2660	2038.7	2740	2380	1923	2830.4	2040.6	2534.8
Moisture content	%	7.6	15.4	9.9	7.5	20	15.4	18	30	25	24	18	32	28	26	24
Ash content	%	59.1	57.4	44.18	50.4	43.5	31.3	44.2	57.4	34.8	46.7	40.4	35.8	56.6	40.2	30.1
Sulfur	%	0.49	0.36	0.39	0.25	0.32	0.27	0.35	0.45	0.23	0.24	0.21	0.25	0.23	0.24	0.29

4.5. Results of fine fraction, i.e., < 4 mm Fraction of solid waste from depth 1-3m for locations 1-5

The fine fraction (<4mm) from separated from bulk solid waste and analyzed for pH, moisture, bulk density, colour, odor, conductivity, organic matter, CHNS, total phosphorus, potassium, and C/N ratio, of location 1-5 for depth 1m-3m. The fine fraction consisted of colour light brown, rotten egg odorous, average pH 7.7, moisture 31.7%, bulk density, 885.5 kg/m<sup>3</sup>, conductivity 0.7mmoh/cm, organic matter 14.5%, total nitrogen 0.7%, total carbon, 9.0%, hydrogen 1.1%, total phosphorus 0.7%, potassium 0.5% and C/N ratio 13.8 respectively (Table 5).



Table 5. Results of fine fraction, i.e., < 4 mm Fraction of solid waste and comparison with FCO (2009) compost standards

S. No	Parameters	Unit	Location 1			Location 2			Location 3			Location 4			Location 5			FCO (2009) Standards
			1m	2m	3m	1m	2m	3m	1m	2m	3m	1m	2m	3m	1m	2m	3m	
1	pH (1:5)		7.3	7.3	7.4	7.7	7.1	7.3	7.7	8.4	7.6	8.1	8.4	7.8	7.9	8.6	6.5-7.5	
2	Moisture content (at 105°C)	%	35	30	15	30	25	30	17.6	42.8	33.3	42.8	33.3	31.3	33.4	33.5	<25	
3	Bulk Density	kg/m <sup>3</sup>	871	810	920	800	980	930	770	820	1077	779	825	930	920	967	<1000	
4	Colour		light brown	light brown	light brown	light brown	light brown	light brown	light brown	light brown	light brown	light brown	light brown	light brown	light brown	light brown	Dark Brown to Black	
5	Odour		rotten egg	rotten egg	rotten egg	rotten egg	rotten egg	rotten egg	rotten egg	rotten egg	rotten egg	rotten egg	rotten egg	rotten egg	rotten egg	rotten egg	Absence of odor	
6	Conductivity (1:5)	mmho/cm	1.239	1.625	1.215	0.326	0.248	1.812	0.259	0.538	0.08	0.18	0.336	0.089	0.407	1.156	<4.0	
7	Organic matter (OM)	%	15.8	13.7	16.3	18.9	11.8	14.6	23.4	14.8	9.5	15.9	11.6	13.7	14.78	9.93	>18.0	
8	Total Carbon (TC)	%	9.9	6.99	8.9	11.46	8	8.27	18.22	12.48	4.9	10.87	5.58	8.66	7.7	5.76	>1.0	
9	Total Nitrogen (N)	%	0.67	0.5	0.67	0.75	0.55	0.61	1.35	0.93	0.31	0.72	0.41	0.54	0.59	0.41	>1.0	
10	Hydrogen (H) Total	%	1.33	0.89	1.22	1.26	0.95	0.96	2.27	1.63	0.56	1.33	0.79	1.14	1.08	0.80		
11	Phosphorus (P2O5)	%	0.69	0.36	0.61	0.72	0.81	0.48	0.54	0.92	1.2	0.24	0.77	0.98	0.69	0.89	>0.5	
12	Potassium (K2O)	%	0.32	0.6	0.44	0.54	0.44	0.88	0.67	0.24	0.48	0.48	0.33	0.78	0.72	0.55	>0.8	
13	C/N ratio		14.9	13.9	13.3	15.3	14.4	13.6	13.5	13.4	15.6	15.3	13.5	12.3	13.1	14.0	20.0	

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**4.5.1. Results of Heavy Metals of Fine fraction (<4mm) of solid waste**

Table 6 shows the concentration of heavy metals such as As, Cr, Cu, Pb, Ni, Hg, Zn, Mn, and Cd in the fine fraction (<4mm) of locations 1-5 and depth 1-3m and their comparison with FCO (2009) compost standards. The average metal concentrations were found to be for As, 3.5 mg/kg, Cr 135.6 mg/kg, Cu 234.5 mg/kg, Pb 64.5 mg/kg, Hg, 0.09mg/kg, Ni, 15.1mg/kg, Zn, 563.3 mg/kg Mn, 410.8mg/kg, and Cd 2.6mg/kg respectively.

Most of the parameters of fine fraction (<4mm) of solid waste satisfy all parameters of FCO Standards except some heavy metals (Cr, Pb, & Cu.). However, it satisfies US EPA Class A, Biosolids Heavy metal limits.

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Table 6. Heavy metal concentration in fine fraction (<4mm size) at Danda Lakhound, and comparison with FCO (2009) compost, US EPA Biosolids standards.

Heavy Metals	Unit	Location 1			Location 2			Location 3			Location 4			Location 5			FCO (2009) Standards	US EPA Class A Biosolids
		1m	2m	3m	1m	2m	3m	1m	2m	3m	1m	2m	3m	1m	2m	3m		
		4.0	2.0	4.0	2.0	4.0	4.0	4.0	2.0	2.0	2.0	4.0	4.0	2.0	4.0	4.0		
Arsenic (As)	mg/kg																	
Chromium (Cr)	mg/kg	194.0	162.0	134.0	66.0	112	149	0	122.0	0	134	86.0	64.0	80.0	84.0	78.0	56.0	1200
Copper (Cu)	mg/kg	184.0	187.0	166.0	494	210	194	0	369.0	0	274	64.0	142	240	306	184	208	1500
Lead (Pb)	mg/kg	48.0	44.0	52.0	76.0	68	57.0	0	133.0	66.0	80	46.0	48.0	0	76.0	52.0	82.0	300
Mercury (Hg)	mg/kg	0.04	0.05	0.02	0.14	0	0.09	0.03	0.03	0.14	0.15	0.00	0.07	0.09	0.12	0.02	0.04	0.15
Nickel (Ni)	mg/kg	18.0	20.0	14.0	6.0	10	18.0	4.0	4.0	8.0	6.0	50.0	4.0	8.0	32.0	22.0	8.0	420
Zinc (Zn)	mg/kg	348.0	588.0	360.0	672	378	402	0	1094	662	158	1770	336	358	618	452	370	2800
Cadmium (Cd)	mg/kg	2.0	2.0	2.0	4.0	2.0	2.0	4.0	4.0	2.0	4.2	2.0	2.0	2.0	4.0	2.0	2.0	5.0

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## 5.0 CONCLUSION AND RECOMMENDATIONS

Based on Surveying and sampling, it was observed that:

1. Component Characterization of waste at FIVE locations and THREE different depths reveals that.
  - a. Plastics including Polythene: 19.2-49.6 %
  - b. Cloth: 0-14.7 %
  - c. Glass: 0-3.9 %
  - d. C&D: 3.1-13.3%
  - e. Wood: 0-4.3 %
  - f. Wood: 0.9-4.4 %
  - g. Soil or Fine fraction: 30.9-70.5 %
2. The average in-situ density varies from 1040-1134 kg/m<sup>3</sup> from 1-3 m depth, Moisture content 18-36.9%, and particle size distribution of >80mm: 8.2-22.5%, 30-80mm 11.3-53.6%, 4-30mm 21.6-48% and <4mm: 7.8-45% from 1-3m depth in five locations.
3. The analysis results of fraction of >30mm for calorific value (Dry Basis), moisture content, Ash content and Sulfur content shows 1850.7-2840 kCal/kg, 7.5-32%, 30.1-59.1% and 0.21-0.49% respectively
4. Most of the parameters of fine fraction (<4mm) of solid waste satisfy all parameters of FCO Standards except some heavy metals (Cr, Pb, & Cu.). However, it satisfies US EPA Class A, Biosolids Heavy metal limits.

  
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