

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL  
AT NEW DELHI**

ORIGINAL APPLICATION NO. 288 OF 2022

IN THE MATTER OF: -

**In re: News item published in The Times of India dated 22<sup>nd</sup> April, 2022, titled  
"Delhi: Another long-drawn effort to douse fire at Ghazipur landfill"**

NDOH: -23.09.2022

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Filed by

  
(Dr. K. S. Jayachandran)

Special secretary (Environment)-cum-  
Member Secretary, Delhi Pollution Control Committee

Respondents

New Delhi

Dated: 21.09.2022

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**RESPONSE OF GOVT. OF NCT OF DELHI WITH RESPECT TO INTERIM PROGRESS REPORT OF JOINT COMMITTEE AND ORDER DATED 22.04.2022.**

1. That this Hon'ble Tribunal in the above referred matter regarding fire incidents at the Ghazipur Dumpsite, vide order dated 22.04.2022 constituted a Joint Committee headed by Justice S.P. Garg, former Judge, Delhi High Court with members from CPCB, DPCC, Department of Urban Development, Delhi, EDMC, Delhi Disaster Management Authority and District Magistrate and DCP, East Delhi. That this Hon'ble Tribunal directed that the Joint Committee may hold its first meeting within one week, undertake visit to the site, interact with the stakeholders, ascertain the factual situation and suggest further course of action after interaction with the concerned stakeholders for prevention of fire incidents at the Ghazipur Dumpsite and that the Committee may consider the landfill dump as isolated and vulnerable site which requires On-site and Off-site fire and other disaster management plans. The Report may be furnished within one month with a copy to the Chief Secretary, Delhi, who may file response with comprehensive plan about the course of action proposed in the matter. It was made clear by the Hon'ble Tribunal that the authorities were free to take further remedial action without waiting for the report of the Committee or orders of the Tribunal.
2. That the Joint Committee filed its Interim Progress Report before the Hon'ble Tribunal on 31.07.2022.

3. That Ghazipur Dumpsite is not an Engineered Sanitary Landfill (SLF). It is a Dumpsite used for dumping of Municipal Solid Waste (MSW) mainly generated from the Trans Yamuna area. The Dumpsite is in operation since 1984 and spread in an area of about 75 Acres. The Dumpsite attained the height of about 65 meters in 2019 and there was about 140 Lakh Tons of MSW dumped at the Ghazipur Dumpsite in July, 2019 as informed by the erstwhile EDMC to Hon'ble Tribunal. Since there is no Engineered Sanitary Landfill (SLF) in Trans Yamuna area dumping of Municipal Solid Waste has continued. About 2600 Tons Per Day (TPD) of MSW is generated in Trans Yamuna area out of which about 2000 TPD of fresh MSW is being dumped at the Ghazipur Dumpsite as no alternate facility is available for the same.
4. That No. of Fire Incidents at Ghazipur Dumpsites in Last Six Years have been reduced significantly due to preventive measures taken by the erstwhile East Delhi Municipal Corporation (EDMC) as given in following Table:

Year	Total No. of fire incidents	No. of major fire incidents	No. of minor fire incidents
2016-17	54	23	31
2017-18	31	26	05
2018-19	18	10	08
2019-20	06	02	04
2020-21	06	04	02
2021-22	03	01	02
2022-23	03	02	01
<b>Total</b>	<b>121</b>	<b>68</b>	<b>53</b>

5. That the major issues mentioned in the said Interim Progress Report of Joint Committee, and the plan of action to address the issues are briefed below:

**(i) Bio-mining of Legacy Waste:**

Bio-mining of Legacy Waste is being carried out by MCD at the three Dumpsites including Ghazipur Dumpsite since 01.10.2019 in compliance of the Orders of Hon'ble National Green Tribunal dated 17.07.2019 in OA No. 519 / 2019 and OA No. 386/2019.

Quantity of segregated materials expected to be generated after complete Bio-mining of Legacy Waste at the three Dumpsites in Delhi are given in the following Table:

S.No.	Particular	Ghazipur Dumpsite (Lakh Ton)	Bhalaswa Dumpsite (Lakh Ton)	Okhla Dumpsite (Lakh Ton)	Total (Lakh Ton)
1	Total Legacy Waste Dumped (July, 2019)	140	80	60	280
2	Inert (less than 30 mm sieve size) (70 %)	98	56	42	196
3	Refuse Derived Fuel (RDF) (15 %)	21	12	9	42
4	Construction & Demolition Wastes (15 %)	21	12	9	42

The total quantity of legacy waste bio-mined till 19.09.2022 at Ghazipur Dumpsite was about 13.21 Lakh Metric Tons (9.43%). The quantity of Bio-mining of legacy waste at three dumpsites is given as below:

S.No.	Name of the Dumpsite	Quantity of Legacy Waste Dumped (As on July, 2019)	Total Quantity of Legacy Waste Processed (As on 19.09.2022)	No. of Trommel Operational
1	Ghazipur	140 Lakh Ton	13.21 Lakh Ton (9.43 %)	12
2	Okhla	60 Lakh Ton	19.64 Lakh Ton (32.73 %)	11
3	Bhalswa	80 Lakh Ton	26.18 Lakh Ton (32.73 %)	19
<b>Total</b>		<b>280 Lakh Ton</b>	<b>59.03 Lakh Ton (21.08 %)</b>	<b>42</b>

- a) Bio-mining will be continued by MCD using 12 High Capacity trommels installed at the Dumpsite having processing capacity of 5000 - 6000 TPD during dry season.
- b) Work orders for transportation of inert have been issued by MCD for a quantity of about 2 Lakh MT. Inert shall be transported mainly to NHAI sites and at other low-lying areas.

- c) Tenders have been invited by MCD on 03.08.2022 for “Disposal of 30 Lakh MT of legacy waste by bio-remediation and bio-mining at Ghazipur dumpsite in Delhi” and the technical bid opening date for the tender is 23.09.2022. The time of completion for the work is 18 months. The scope of work includes bio-remediation of legacy waste and disposal / transportation of segregated material by the agency.
- d) 100 % Bio-mining of Legacy Waste at the Ghazipur Dumpsite is likely to be completed by March, 2024 as per report of MCD. MCD will make its best endeavors to achieve the timeline of March 2024 subject to availability of land and processing facilities for disposal of bio-mined material and budget.

**(ii) Disposal of RDF**

Month wise details of RDF disposed off in the last four months are as under: -

S.No.	Month	Quantity of RDF Disposed off (in MT)
1	May, 2022	386
2	June, 2022	2253
3	July, 2022	8575
4	August, 2022	9659
5	Sept, 2022 (Till 19.09.2022)	14052

MoU between MCD and JK Cement Ltd. for disposal of RDF recovered through bio-remediation of legacy waste at Bhalaswa, Ghazipur and Okhla Dumpsites has been signed on 25.08.2022 for lifting of 3000 TPD from all the three dumpsites (1000 TPD from each dumpsite).

**(iii) Status of Waste to Energy Plant**

Waste to Energy Plant was established at Ghazipur in agreement with IL&FS with processing capacity of 1300 TPD of Municipal Solid Waste. The Waste to Energy Plant was under Refurbishment / Revamping due to which Plant was shut down for more than six months. Earlier it was in deteriorated condition due to financial crisis in IL&FS. After Refurbishment /Revamping, the WTE Plant restarted its operation in May, 2022.

For delay in operation of the Waste to Energy Plant at Ghazipur at full capacity, Show Cause Notice was issued by erstwhile EDMC to M/s Ever

Enviro Resource Management Pvt. Ltd on 13.05.2022 for imposition of penalty amounting to Rs. 2,57,35,194. After unification of MCD, the process for another Show Cause was initiated for imposition of penalty amounting to Rs. 3,75,49,886.

The date wise details of Fresh MSW & RDF intake and electricity generated at the WtE Plant at Ghazipur since restart of the plant on 10.05.2022 is given at **Annexure - I**. The quantity of MSW/ RDF processed presently is 900 MT per day. The quantity is expected to reach 1100 MT per day by 30<sup>th</sup> September 2022. Further 1300 MT per day processing is expected to be done by 15th November 2022.

The new Waste to Energy Plant of 2000 TPD capacity at Tehkhand is likely to be operational by November, 2022. MCD intends to dispose off about 1000 TPD of fresh MSW from East Delhi to this new WtE at Tehkhand so as to reduce the load on Ghazipur Dumpsite.

**(iv) Disposal of inert**

The inert material generated from the Bio-mining of Legacy Waste is disposed off by MCD at NHAI sites (UER-II, NH-44, Faridabad Bypass), low lying areas in the vicinity, paper market, DDA etc. Month wise details of Inert disposed off in the last four months are as under: -

S. No.	Month	Quantity of Inert material Disposed off (In MT)
1	May, 2022	33450
2	June ,2022	33251
3	July, 2022	26261
4	August, 2022	93755
5	Sept, 2022 (Till 19.09.2022)	85220

Record is being maintained at the site regarding the quantity of material disposed off to NHAI & other sites. The progress of work was hampered in July & August 2022 due to rainy season. However, the quantity of inert transported daily has now increased to about 3000 TPD in the last week by deployment of more trucks.

DCP (Traffic) East was requested by MCD to allow plying of vehicles during day time and details of such vehicles was provided to the Traffic Police Deptt. The vehicles carrying inert are now plying during day time as well as night. An appeal has been made by MCD and published in the Newspapers for utilization of Inert Material generated from the Bio-mining of Legacy Waste. So far, around 17,000 MT of inert and C&D waste has been lifted by Private Agencies/individuals at their own cost.

The bio-mined inert material will continue to be disposed off at NHAI sites (UER-II, NH-44, Faridabad Bypass) and other low-lying areas.

### **Disposal of Construction & Demolition Waste generated from Bio-mining of Legacy Waste**

Construction and Demolition Waste which is 10-15% of the total Bio-mined Legacy Waste is utilised at the Dumpsite in making roads for the movement of vehicles.

#### **(v) Prevention of Fire Incidents**

##### **a. RCC Boundary Wall**

Presently there is no boundary wall around the periphery of the Dumpsite. Barricading in a length of 550 meters has been provided by MCD around the Ghazipur Dumpsite to prevent unauthorized entry of the rag-pickers and unauthorized persons.

##### **b. Installation of Spark Arrestors.**

Instructions have been issued by MCD vide letter dated 04.07.2022 to all concerned officials for installation of spark arrestors in all vehicles being used at the Dumpsite.

The vehicles transporting fresh waste to the dumpsite are deployed by the concessionaire which has informed that 22 of their vehicles are BS-VI compliant and have exemption for spark arrestors due to their specially designed silencer and other systems as per the letter from Ministry of Commerce and Industry, Govt. of India. Strict instructions have been issued for installation of spark arrestors on the remaining vehicles of the concessionaire. The vehicles deployed for transportation of inert are deployed by contractors

on short term basis, however they do not ply in the fire prone area (fresh waste dumping site). However, efforts are being made by MCD for ensuring compliance of directions for all vehicles coming to landfill site.

All the vehicles being used for dumping of MSW and lifting of bio mining material will be fitted with spark arrester by 15<sup>th</sup> November 2022.

**c. Temperature Sensors**

For checking the temperature of the inner surface of dumpsite at vulnerable locations, two temperature sensors are being used and the record is being maintained.

**d. Perforated Pipes for Release of Methane**

A pilot project for extraction of methane gas was undertaken by GAIL at Ghazipur Dumpsite in 2016. However, the project was stopped as it was not found commercially viable.

**e. CO Monitors, Methane Detectors, Temperature Sensors & Fire Alarm**

For checking the temperature of the inner surface of dumpsite at vulnerable locations, temperature sensors are being used and the record thereof is being maintained.

**f. CCTV Cameras**

The existing CCTV monitoring system consisting of 17 CCTV is working at Ghazipur Dumpsite.

Further the work of installation of 15 additional CCTV cameras are at tender stage and likely to be completed by 15.11.2022.

**g. Drone Survey of Ghazipur Dumpsite**

Drone Survey of the Ghazipur Dumpsite has been carried out and the report has been submitted by the surveyor on 20.07.2022 and the same is enclosed as **Annexure -II**. SLF site area is 75.08 Acres (30.308 Hectares) as per the survey report. SLF site area considered for volumetric assessment is 73 acres (29 Hectares). The contours of the landfill along with slopes analysis details have been given in the report. At 200 meter baseline level, waste volume is

83.0 Lakh Cubic meters and Maximum Height is 67 meters. At 202 meter baseline level, maximum height is about 65 meters.

**h. Direction to Bulk Waste Generators for Installation of Composters / Bio-methanation Plants.**

MCD vide letter dated 05.08.2022 has requested APMC Ghazipur, Fish, Poultry & Egg Market Committee, Flower Marketing Committee, ITPO Pragati Maidan to comply the direction of the Committee and make their own arrangement for the scientific disposal of waste as per MSW Rules, 2016 on priority. Copy of the letter dated 05.08.2022 of MCD is enclosed as **Annexure-III.**

**i. Slope Stability to Prevent Landslide:**

A consultancy work was awarded to IIT Delhi in November, 2017 for the study of stability analysis of Waste Slope Parallel to Canal at Ghazipur landfill and Technical Advice for Short Term Stabilization Measures. The Report was submitted by IIT Delhi for erstwhile EDMC. A proposal based on the report was prepared under UDF. But the proposal was dropped as the slope stabilization was no more required as the process of Bio-remediation for removing the land fill site has been started in the year 2019 as per the directions of Hon'ble National Green Tribunal.

**j. Mock Drill at the Ghazipur Dumpsite**

To sensitize the site staff at Ghazipur Dump site, a fire mock drill was conducted on 18.05.2022 by Delhi Disaster Management Authority and the instructions during the mock drill are being complied with by the field officers.

**k. Authorization of Ragpickers:**

It has been suggested by the Joint Committee that NGOs like 'Chintan' can be involved to regulate the entry of ragpickers at the Dumpsite. The said agency can deploy specific number of ragpickers for the purpose of segregation and recycling at the dumpsite. The ragpickers can be given identity cards and Civil Defense volunteers can be made available by DM (East).

MCD has approved a policy to engage ragpickers through authorized recyclers/kabadiwalas at dumpsites. An expression of interest in this regard has already been invited.

**l. Construction of Peripheral Road**

Peripheral Road is already available around Ghazipur Dumpsite.

**m. Surveillance Squad/ Patrolling Team**

Patrolling team has been formed by MCD to have strict vigil over the activities going on at the Ghazipur Dumpsite.

Beat Constables have been deployed by Delhi Police for taking rounds of the Dumpsite.

**n. Lack of Land Availability for MSW Processing Facilities -Alternative**

**Land in place of Ghonda Gujran Site:** Integrated Solid Waste Management Facility of 2000 TPD was planned by erstwhile EDMC jointly with NTPC at Ghonda Gujran on the land allotted by DDA. However, Principle Committee constituted by Hon'ble National Green Tribunal rejected the proposal on 14.01.2022 as the site falls under the flood plain of Yamuna River. Vide letter dated 15.06.2022 addressed to Secretary, Department of Water Resources, Ministry of Jal Shakti, Govt. of India, MCD has requested to reconsider the proposal, however, request of MCD has not been considered.

Urban Development Department, Govt. of NCT of Delhi has written letters to DDA regarding land required for various activities for Solid Waste Management in Delhi including future requirements. However, land for MSW Processing Facilities particularly for the waste generated in East Delhi / Trans Yamuna Area is yet to be allotted by DDA.

MCD also requested DDA on 15<sup>th</sup> September 2022 for allotment of land in East Delhi to create facility for waste processing.

**o. Training of MCD Staff**

A three days training programme was organised by NDRF to the MCD Staff (One Batch per day). NDRF has provided training to 250 MCD staff till date. Further request has also been made to Delhi Fire Service for training programs.

On other issues mentioned in the Interim Progress Report of Joint Committee, Action Taken by MCD and Prospective Action Plan is briefed in following table:

S.No	Issues w.r.t Ghazipur Dump site mentioned in Interim Progress Report of Joint Committee	Action taken / Remarks	Prospective Action Plan
<b>Waste to Energy Plant</b>			
1.	Detailed enquiry is required to be conducted as to under what circumstances the WtE Plant remained shut for more than 7 months and who was responsible for its closure	WTE plant was established on 21.05.2008. WTE was not operational since September-2021 due to refurbishment/revamping. In this regard pursuance has been made with concessionaire to resume operations and asked to show-cause why penal action in accordance to the concession agreement be not initiated.	The quantity of MSW/RDF processed presently is 900 MT per day. The quantity is expected to reach 1100 MT per day by 30 <sup>th</sup> September 2022. Further 1300 MT per day processing is expected to be done by 15 <sup>th</sup> November 2022.
2.	More WtE Plants are required, WTE plant at Ghazipur is inadequate to meet the requirements	Land is required for creating WtE plant facility for which DDA has regularly been pursued.	a) The matter is being explored to get the land allocated from DDA. b) One additional WtE plant at Tehkhand (Okhla) having capacity of processing 2000 MT MSW shall be made operational by November, 2022. Another plant with capacity of 3000 MT has been planned at Narela-Bawana. RFP for the same has been initiated and it is expected that same would be operational by Dec. 2024. After setting up of this plant MCD will be in a position to fix up the gap in processing facility.

S.No	Issues w.r.t Ghazipur Dump site mentioned in Interim Progress Report of Joint Committee	Action taken / Remarks	Prospective Action Plan
3.	Present WtE is running at 70% of its capacity.	Concessionaire is being pursued to run the plant at full capacity vide various letter / show cause notice.	Action as prescribed in concession agreement shall be taken. The quantity of MSW/ RDF processed presently is 900 MT per day. The quantity is expected to reach 1100 MT per day by 30 <sup>th</sup> September 2022. Further 1300 MT per day processing is expected to be done by 15 <sup>th</sup> November 2022.
4.	The Committee took serious note of non-operationalization of WtE Plant	Concessionaire was pursued and plant has been made operational. All attempts are being made to run this plant at full capacity.	Action as prescribed in concession agreement shall be taken. Hon'ble Lt. Governor and Chief Secretary both have visited the Ghazipur Dumpsites and Waste to Energy Plant at Ghazipur. The Waste to Energy Plant at Ghazipur has finally restarted its operation and now processing 900 TPD, which will be further increased by the Concessionaire/Operator of WTE Plant. The quantity is expected to reach 1100 MT per day by 30 <sup>th</sup> September 2022. Further 1300 MT per day processing is expected to be done by 15 <sup>th</sup> November 2022.
5.	Alternative land to MCD	DDA has been requested to allot alternate land to MCD for establishing Waste to Energy Plant.	Matter is being taken up at higher level. Recently, a letter dated 15 September 2022 has been written to the DDA.
6.	Space/ facility at	Remediation of	New WTE plant of 2000

S.No	Issues w.r.t Ghazipur Dump site mentioned in Interim Progress Report of Joint Committee	Action taken / Remarks	Prospective Action Plan
	Okhla can be utilized to dump MSW garneted within the MCD area to lessen the load at Ghazipur dumpsite.	legacy waste at Okhla SLF is also in progress.	TPD with 25 MW Electricity generation at Tehkhand is under construction and likely to be made operational in the month of November, 2022, wherein possibility to utilize 1000 MT of waste from Trans Yamuna area shall be explored.
<b>Inert disposal</b>			
1.	NHAI has sent requirement of inert for filling up of embankments/ road shoulders for 50 lakhs MT	A requirement of 20 Lac MT of inert from NHAI UER-II for SLF Ghazipur was received vide letter no. NHAI/PIU/UER-II/49/01/57 dated 07.01.2022. So far approximately 1.50 Lac MT of inert has been sent to NHAI sites.	MCD is planning to increase the processing of legacy waste and supplying of inert to NHAI & other sites for which an integrated tenders (new technology) have been invited.
2.	Huge inert lying at the site has since been transported to NHAI completely.	A requirement of 20 Lac MT of inert from NHAI UER-II for SLF Ghazipur was received vide letter no. NHAI/PIU/UER-II/49/01/57 dated 07.01.2022. So far approximately 1.50 Lac MT of inert has been sent to NHAI sites.	MCD is planning to increase the processing of legacy waste and supplying of inert to NHAI & other sites for which an integrated tenders (new technology) have been invited.
3.	Conversion into powder form for its use in NTPC at Dadri.	RDF can be used as a fuel for Waste to Energy Plant and cement factories for which possibility are being explored.	As pilot project MCD had tied up with cement manufactures. An MoU has been signed with JK Cement Pvt. Ltd. for transporting 3000MT of RDF per month to their cement plant in Rajasthan (Chitorgarh).

S.No	Issues w.r.t Ghazipur Dump site mentioned in Interim Progress Report of Joint Committee	Action taken / Remarks	Prospective Action Plan
<b>Bio-mining of Legacy Waste</b>			
1.	Segregation of Waste at source in trans Yamuna area	IEC activities are being carried out among the residents / generators to segregate the waste. Concerned field officers have been asked to imposed penalty against the violators as per Solid Waste Management Rules 2016 by the Zonal staff.	IEC Activities are being regularly carried out.
2.	Prevention of dumping of fresh Municipal Solid Waste at Ghazipur dumpsite.	As no alternate land is available, the fresh waste is continued to dump at SLF Ghazipur at present.	DDA has been requested to provide land for creating facilities for waste management. Alternatively, MCD is working out to manage this waste by using it at newly constructed waste to energy plant at Tehkhand (Okhla) which would be operational from November, 2022.
3.	Prevention of dumping of industrial waste E-Waste/ Lithium Battery at Ghazipur dumpsite.	Industrial waste/e-waste are under the mandate with DPCC, hence same is not being accepted at SLF Ghazipur.	-
4.	Minimization, segregation, recycling and reuse of materials.	Segregation of waste is being ensured and 3R (Reduce, Reuse, Recycle) initiatives are also being ensured. Zonal / Field officers have been asked to ensure 3R initiatives.	IEC activities among the generator/ residents will be continued.
5.	Levying of charges / penalty	Work of collection and transportation of	The penalty imposed (Garbage Dumping) to

S.No	Issues w.r.t Ghazipur Dump site mentioned in Interim Progress Report of Joint Committee	Action taken / Remarks	Prospective Action Plan
	for dumping unsegregated MSW at dumpsite.	MSW has been awarded and actions for levy of penalty is ensured at the Zonal office.	violators from 15.04.2022 to 31.08.2022 is Rs.29.303 lakh.
6.	Bye-laws notified in 2018 for Delhi placing the onus on those who generate it including households.	Generators / residents are being made aware to ensure segregation of waste through IEC activities.	IEC activities among the generator/ residents are to be continued.
<b>Prevention of Fire Incidents</b>			
1.	Deficiencies shortcomings noted at the time of fire mock drill	Emergency numbers have been displayed. CCTV cameras are installed and working 24X7. Staff is deputed in shifts 24X7. The patrolling team is deployed to detect fire if any. There are separate entry and exit gates. SOPs for SLF is prepared and displayed.	To sensitize the staff at SLF Ghazipur. Plan prepared to install CCTV cameras all around the landfill to avoid unauthorized access. Plan prepared for electrifying the entire area to keep strict vigils and watch & ward.
2.	Separate Entry and exist gats	Entry & exit gate with a divider exists.	-
3.	Establishment of an emergency control room which would be operational on 24x7.	Site office exists, which is operational 24X7 equipped with CCTV camera.	-
4.	Preparation of SOPs disaster management plan and excavation plan and keep it at site.	SOP for SLF have been prepared and displayed at site.	SOP for SLF have been prepared and displayed at site.
5.	Recurring spots	Fire generally occurs	Area is earmarked where

S.No	Issues w.r.t Ghazipur Dump site mentioned in Interim Progress Report of Joint Committee	Action taken / Remarks	Prospective Action Plan
	needs to be identified.	where fresh garbage is dumped, which have been identified.	fresh garbage is dumped.
6.	Insertion of perforated HDPE pipes.	HDPE pipe insertion is in progress.	
7.	Increasing number of tankers for sprinkling of water.	Two tankers for sprinkling of water are deployed in all the three shifts.	Action already taken.
8.	Deployment of adequate heavy machinery at the dumpsite.	Department's machinery i.e. 04 bulldozers, 06 excavators & 02 backhoe loaders are working at site. In addition to the machinery being used in the bio-mining process of legacy waste.	Action already taken.
9.	Erection of security watch towers for proper ward and watch of the dumpsite.	At present 17 nos. of cameras are working to cover/ watch the SLF round the clock.	Further work of installation of additional 15 CCTV cameras are at tender stage and likely to complete by 15 <sup>th</sup> Nov. 2022.

6. Operational Waste to Energy Plants & Integrated Solid Waste Management Facilities, Gap Analysis on Solid Waste Management and proposed Waste Processing & Disposal Facilities in Delhi are given in following tables:

**Operational Waste to Energy Plants & Integrated Solid Waste Management Facilities in Delhi**

S.No.	Name of Waste to Energy Plant	Existing Capacity	
		Waste Processing (in TPD)	Electricity Generation (in MW)
1.	Timarpur Okhla Waste management Company Ltd., Old NDMC Compost Site, Okhla.	1950	23

S.No.	Name of Waste to Energy Plant	Existing Capacity	
		Waste Processing (in TPD)	Electricity Generation (in MW)
2.	East Delhi Waste Processing Company Ltd., Ghazipur	1300	12
3.	Delhi MSW Solutions Ltd Narela Bawana Road, Bawana (Waste to Energy Plant – 1300 TPD and Compost Plant – 700 TPD)	2000	24
<b>Total</b>		<b>5250</b>	<b>59</b>

### Gap Analysis on Solid Waste Management in Delhi

Generation	Total Capacity of Existing MSW Processing Facilities (Excluding Pit Composting & MRFs)	Gap in Processing Capacity	Capacity of proposed Processing Facilities
11357 TPD	5360 TPD	5997 TPD	6452 TPD

### Proposed Waste Processing & Disposal Facilities in Delhi

S.No.	MSW Facility	No (s)	Location	Local Body	Capacity (in TPD)	Expected Timeline for Completion
1.	Waste to Energy Plant	1	Tehkhand	MCD	2000	Nov, 2022
2.	Waste to Energy Plant	1	Narela-Bawana [For 3 Zones (City-SP, Karol Bagh & Narela Zone)]	MCD	3000	Aug, 2025
3	Expansion of existing WtE at Okhla	1	Okhla	MCD	1000 (From 1950 TPD to 2950 TPD)	Public Hearing held on 16.08.2022 & Proceedings of Public Hearing sent to MoEF&CC on 24.08.2022.
4.	Bio CNG Plant	1	Okhla	MCD	300 TPD (From existing compost plant of 200 TPD to 300 TPD)	Sep, 2023
5.	Compressed Bio Gas (CBG) Plant	1	Hastsal	MCD	100 TPD	Apr, 2023
6.	Sorting cum Composter	2	Kirby Place in Delhi Cantt.	DCB	50 TPD (Total	Sep, 2022

S.No.	MSW Facility	No (s)	Location	Local Body	Capacity (in TPD)	Expected Timeline for Completion
	Plants				Capacity of 2 Plants)	
7.	Decentralised Composter Plants	2	<ul style="list-style-type: none"> <li>• Ramleela Ground</li> <li>• Vishwas Nagar</li> </ul>	MCD	2 (1 TPD each)	<ul style="list-style-type: none"> <li>• Sep, 2022</li> <li>• Oct, 2022</li> </ul>
8.	Engineered Sanitary Landfill (SLF)	1	Tehkhand	MCD	-----	Apr, 2023
	<b>Total</b>	<b>09 + 01 SLF</b>			<b>6452 TPD</b>	

**Note:**

- i. Bio-CNG Plants at Nangli Dairy (215 TPD), Goyla Dairy (215 TPD), Ghogha Village Dairy (290 TPD) by March, 2023 mainly for the Waste generated from Dairies.
  - ii. Two MRFs one each at Bhalaswa Dairy (150 TPD by Dec, 2022) and Rampura (30 TPD extendable upto 50 TPD) are proposed.
7. That Government of NCT of Delhi will abide by the orders passed by this Hon'ble Tribunal.

Above report / response of Government of NCT of Delhi with respect to interim progress report of joint committee may please be taken on record for consideration/ further directions please.



(Dr. K.S. Jayachandran)

Special Secretary (Environment)-cum-  
Member Secretary, Delhi Pollution Control Committee

New Delhi

Dated: 21.09.2022

Annexure-I

Date wise details of Fresh MSW & RDF intake and electricity generated at the WtE Plant at Ghazipur since restart of the plant on 10.05.2022

DATE	RDF (MT)	MSW (MT)	TOTAL (MT)	ELECTRICITY GENERATION (KWH)
<b>May-22</b>				
10-05-2022	69.27	0	69.27	0
11-05-2022	54.38	0	54.38	0
12-05-2022	65.20	0	65.20	0
13-05-2022	0.00	0	0.00	0
14-05-2022	0.00	0	0.00	0
15-05-2022	0.00	0	0.00	0
16-05-2022	26.50	0	26.50	0
17-05-2022	0.00	0	0.00	0
18-05-2022	0.00	0	0.00	0
19-05-2022	49.79	0	49.79	0
20-05-2022	44.75	0	44.75	0
21-05-2022	0.00	0	0.00	0
22-05-2022	0.00	0	0.00	0
23-05-2022	0.00	0	0.00	0
24-05-2022	0.00	0	0.00	0
25-05-2022	27.95	0	27.95	0
26-05-2022	48.29	0	48.29	0
27-05-2022	0.00	0	0.00	0
28-05-2022	0.00	0	0.00	0
29-05-2022	0.00	0	0.00	0
30-05-2022	0.00	0	0.00	0
31-05-2022	0.00	0	0.00	0
			<b>386.13</b>	<b>0</b>
<b>Jun-22</b>				
01-06-2022	30.055	0	30.055	0
02-06-2022	24.290	0	24.290	0
03-06-2022	67.115	0	67.115	0
04-06-2022	94.710	0	94.710	0
05-06-2022	0.000	0	0.000	0
06-06-2022	0.000	0	0.000	0
07-06-2022	84.600	0	84.600	0

Annexure-I

08-06-2022	116.360	0	116.360	0
09-06-2022	86.940	0	86.940	0
10-06-2022	0.000	0	0.000	0
11-06-2022	124.560	0	124.560	0
12-06-2022	215.930	0	215.930	0
13-06-2022	360.770	0	360.770	0
14-06-2022	84.735	0	84.735	0
15-06-2022	85.870	0	85.870	0
16-06-2022	0.000	0	0.000	0
17-06-2022	0.000	0	0.000	0
18-06-2022	0.000	0	0.000	0
19-06-2022	0.000	0	0.000	0
20-06-2022	38.860	0	38.860	0
21-06-2022	0	0	0.000	0
22-06-2022	0	0	0.000	0
23-06-2022	13.820	0	13.820	0
24-06-2022	0.000	0	0.000	0
25-06-2022	0.000	0	0.000	0
26-06-2022	100.685	0	100.685	3842
27-06-2022	161.115	0	161.115	0
28-06-2022	210.460	0	210.460	0
29-06-2022	352.800	0	352.800	32098
30-06-2022	0.000	46.75	46.750	7020
			<b>2300.425</b>	
<b>Jul-22</b>				
01-07-2022	0.000	31.32	31.320	33904
02-07-2022	137.185	39.97	177.155	146749
03-07-2022	311.480	119.43	430.910	128802
04-07-2022	64.835	159.36	224.195	136826
05-07-2022	359.280	42.11	401.390	132128
06-07-2022	352.100	44.58	396.680	133662
07-07-2022	328.860	104.19	433.050	133550
08-07-2022	118.535	69.18	187.715	131024
09-07-2022	196.185	61.8	257.985	107540
10-07-2022	85.000	13.36	98.360	0
11-07-2022	215.565	0	215.565	0
12-07-2022	305.980	43.59	349.570	0
13-07-2022	292.420	185.12	477.540	0
14-07-2022	442.970	226.17	669.140	0
15-07-2022	511.770	71.02	582.790	0
16-07-2022	336.180	106.39	442.570	11022
17-07-2022	0.000	169	169.000	140550
18-07-2022	237.215	239.17	476.385	119300

Annexure-I

19-07-2022	319.225	194.99	514.215	127576
20-07-2022	126.210	190.93	317.140	158536
21-07-2022	167.630	208.175	375.805	135976
22-07-2022	311.845	175.6	487.445	14314
23-07-2022	462.960	254.89	717.850	14290
24-07-2022	0.000	395.17	395.170	66234
25-07-2022	346.500	205.36	551.860	74312
26-07-2022	651.805	224.18	875.985	41704
27-07-2022	473.788	205.36	679.148	5838
28-07-2022	426.730	493.69	920.420	72484
29-07-2022	727.530	527.04	1254.570	89474
30-07-2022	265.5	650.24	915.740	51662
31-07-2022	0	929.7	929.700	12518
			<b>14956.368</b>	
<b>Aug-22</b>				
01-08-2022	180.000	358.26	538.260	0
02-08-2022	0.000	571.3	571.300	0
03-08-2022	189.000	731.51	920.510	0
04-08-2022	180.000	467.93	647.930	0
05-08-2022	270.000	700.73	970.730	0
06-08-2022	283.500	783.62	1067.120	0
07-08-2022	0.000	594.09	594.090	0
08-08-2022	94.500	363.78	458.280	0
09-08-2022	0.000	100.99	100.990	78822
10-08-2022	162.000	92.73	254.730	113762
11-08-2022	4.510	82.81	87.320	10568
12-08-2022	69.330	113.6	182.930	990
13-08-2022	0.000	482.14	482.140	5902
14-08-2022	0.000	434.61	434.610	372
15-08-2022	0.000	456.99	456.990	0
16-08-2022	13.500	554.96	568.460	0
17-08-2022	0.000	283.19	283.190	0
18-08-2022	6.070	674.42	680.490	114012
19-08-2022	25.250	396.97	422.220	175966
20-08-2022	436.350	0	436.350	193368
21-08-2022	454.030	0	454.030	185856
22-08-2022	395.600	10.21	405.810	153788
23-08-2022	671.445	0	671.445	149760
24-08-2022	515.700	0	515.700	170292
25-08-2022	627.720	0	627.720	163240
26-08-2022	301.715	0	301.715	175300
27-08-2022	241.905	0	241.905	140896
28-08-2022	293.065	0	293.065	201652

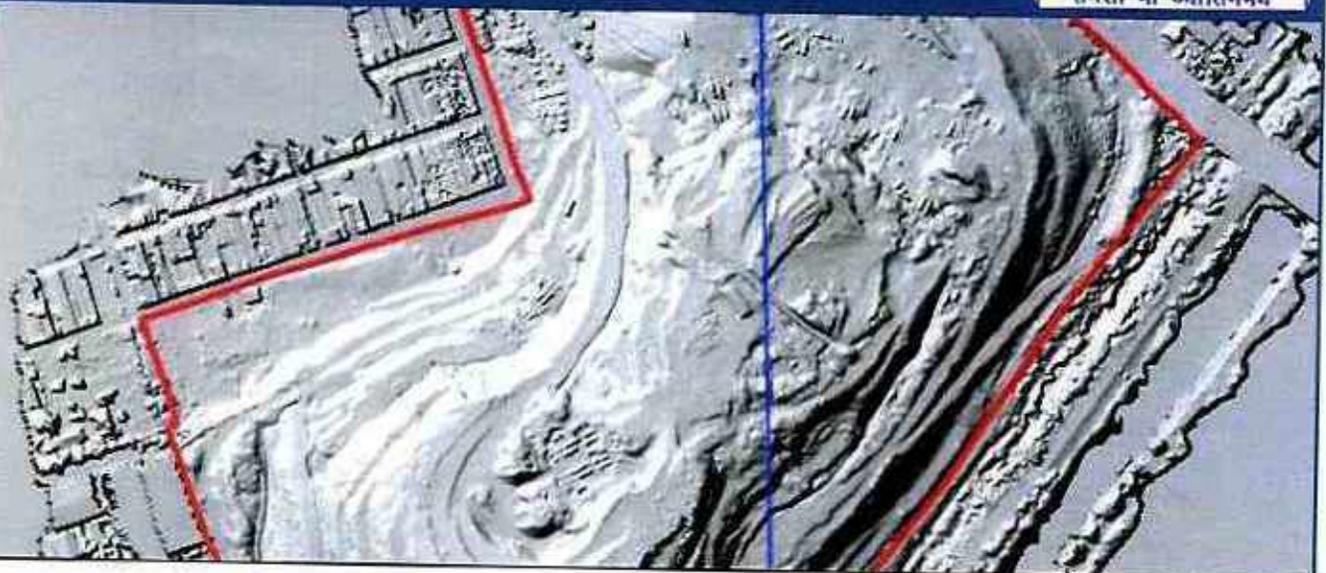
Annexure-I

29-08-2022	297.845	0	297.845	200900
30-08-2022	531.970	0	531.970	109124
31-08-2022	394.055	0	394.055	165840
			<b>14893.900</b>	
<b>Sep-22</b>				
01-09-2022	525.740	0.000	525.740	180992
02-09-2022	529.42	0.000	529.420	147160
03-09-2022	384.865	0.000	384.865	132288
04-09-2022	422.645	262.120	684.765	193150
05-09-2022	464.435	438.900	903.335	160816
06-09-2022	569.250	549.400	1118.650	220724
07-09-2022	519.935	231.790	751.725	209672
08-09-2022	540.87	557.37	1098.24	138628
09-09-2022	615.47	338.33	953.79	0
10-09-2022	305.23	573.26	878.49	96164
11-09-2022	336.49	675.73	1012.22	133172
12-09-2022	497.92	764.44	1262.36	177436
13-09-2022	548.88	525.37	1074.25	155648
14-09-2022	663.77	348.89	1012.66	148220
15-09-2022	692.24	290.62	982.865	155960
16-09-2022	417.28	345.83	763.11	162668
17-09-2022	92.49	536.87	629.36	208876
18-09-2022	649.6	440.4	1090	195456
19-09-2022	526.05	461.55	987.6	193752
			<b>16643.21</b>	

Municipal Corporation of Delhi



तमसो मा ज्योतिर्गमय



## Change Detection and Volumetric Assessment of Ghazipur SLF Using Drone Survey

REPORT – 1,  
SLF GHAZIPUR, EXISTING SITUATION

JUNE 2022



CARITAS ECO SYSTEMS PVT LTD

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# Sanitary Landfill Facility, Ghazipur

## 1 Introduction

With the increasing urbanization, there is tremendous increase in municipal solid waste. It is estimated that Delhi generates about 11,144 TPD<sup>1</sup>. Of this, the MSW generated in MCD area (east zone) is about 2600 TPD. Presently there are three dump sites in Delhi at Bhalaswa, Ghazipur and Okhla. The dump sites have exceeded their capacity and are required to be managed in a more scientific and environmentally sustainable manner.

### 1.1 Location

The current project focusses on the MCD's SLF located in Ghazipur. The dump site is located at 28°62'48.8"N and 77°32'7.95" E, it is adjacent to Delhi - Uttar Pradesh border next to Delhi Meerut express way. The landfill is accessible from Ghazipur road on the west and expressway on the north – and Dr Hedgewar road is on the east. There is Poultry market next to the site towards north and a drain (nala) towards the south of the site.

Figure 1: Location of SLF, Ghazipur



### 1.2 Existing Condition

The landfill site was started in 1984 and is officially spread over an area of 70 acres. The landfill is an unlined historical dumpsite, which is owned and operated by the Municipal Corporation of Delhi. Waste lying on site has very steep slopes<sup>2</sup>. The height of the dump site, as per official records is 65 m

<sup>1</sup> Compliance Report of Govt. of NCT of Delhi in QA No. 606/2018 (February 2020)

<sup>2</sup> Source: Environmental Impact Assessment Report for Proposed Sanitary Landfill Area – 32 Acre, June 2018 by SDMC

with legacy waste of about 140 lakh MT. About 7% of the waste generated is processed in the waste processing facility under MCD. Presently MCD has 24 trommels operating at Ghazipur landfill site, with 400 tons waste being removed every day. The corporation has stated that out of 140 lakh MT waste at Ghazipur, 10.52 lakh MT has been removed.

### 1.3 Project Objective

MCD has decided to close the existing Ghazipur Dump site and to establish an Engineered Landfill site near to the existing site. The dump site is cleared through Bio-mining/remediation. For this purpose, MCD has appointed the consultant to conduct a drone-based survey to monitor the progress of the process.

**Project objective: To conduct a Drone based survey of Sanitary Landfill Facility (SLF) site at Ghazipur for volumetric assessment of waste.**

The scope of the work is:

1. Conduct drone survey of existing Sanitary Landfill site.
2. Creation of 3D model and ortho image using the drone survey.
3. Volumetric assessment, slope analysis and change detection of the waste dump.

### 1.4 Benefits of Drone Survey

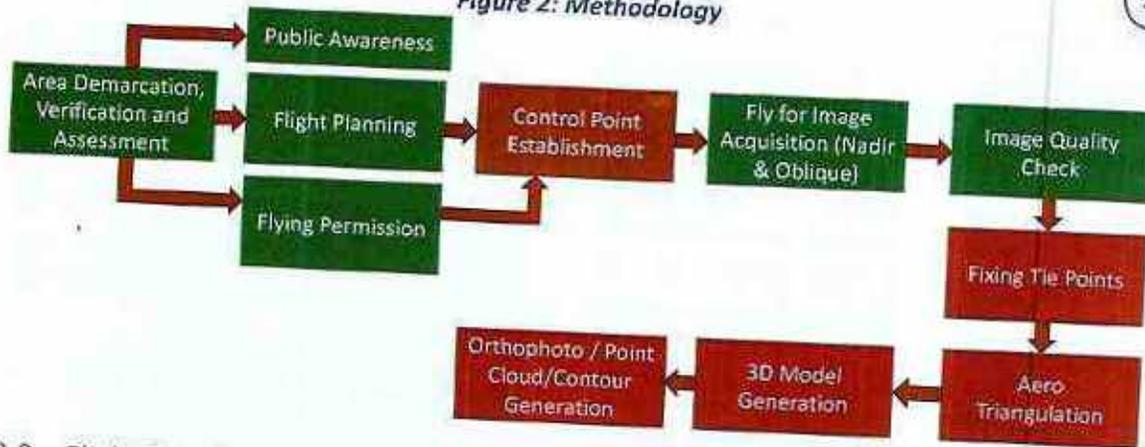
1. Time and Location stamped photographic record of "As Is" condition and thereby generating qualitative and quantitative baseline data.
2. Periodic data collection and comparative analysis will help in measurement of change in volume, average periodic volume etc.
3. Contouring and slope measurement of landfill site.

## 2 SLF Ghazipur Drone Survey

### 2.1 Methodology

The Consultant has adopted a detailed survey approach in order to get the best results. Once the LoA was received, multiple site visits were made and the site boundary was demarcated. The site area as per some past reports and informed by the Client was about 70 acres, however during the site visits and site boundary demarcation exercise it was observed that the actual area of the landfill site is about 75.08 acres. Considering the existing situation, the consultant planned the aerial survey missions to cover the increased area. It is to note that there is about 7.5% increase in the actual site area. Subsequently, with Client's assistance, a letter was submitted to Delhi Police for their information and approval. Once the go-ahead was received, control points were marked and site images were captured using drone. Multiple missions were planned and executed with multiple camera angles and high image overlaps. The images captured were verified and put to processing to generate the desired results. The schematic view of the methodology adopted is presented in the Figure 2.

Figure 2: Methodology



## 2.2 Flight Planning and Image Capture

The Consultant has flown the drone as per the guidelines prescribed by DGCA. Multiple flight missions were planned to get the best quality and accurate output. As mentioned earlier, multiple missions are planned for drone flight. Flight plans are presented in Figure 3.

Figure 3: Flight Plan



About 7000 images of the SLF site were captured with multiple angles. Snapshots of some pictures are presented in Figure 3.

Figure 4: Drone Images



## 2.3 Observations During Survey

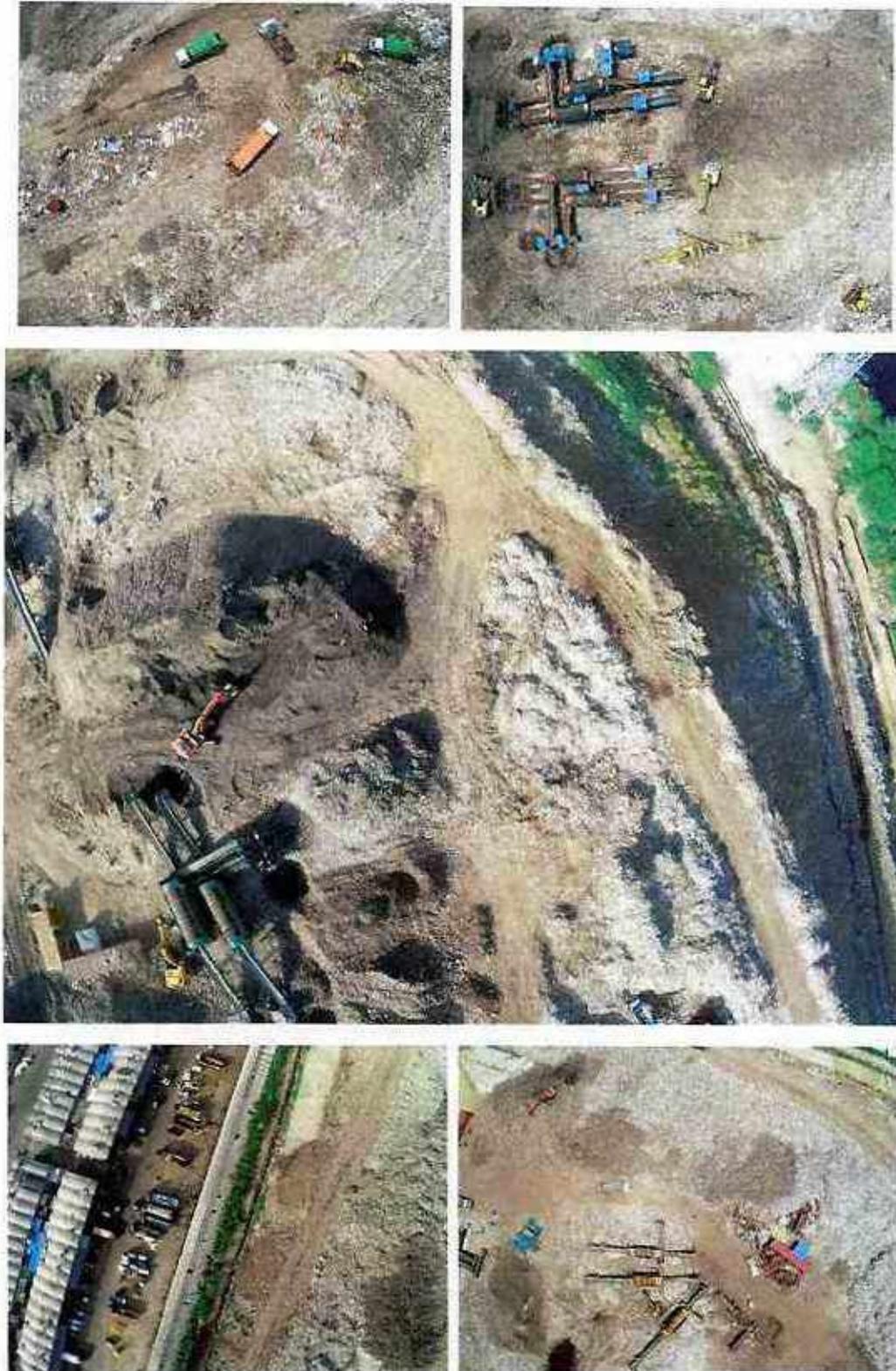
### 2.3.1 Birds

Birds are a menace and safety issue at the landfill site. The birds obstructed the drone flight many times and was at risk of being attacked. During the flight mission, the drone had to be called back before completing the mission because of the danger of being hit by birds. The Consultant has to stop the drone survey couple of times for the birds to disperse away. This resulted in increase in field survey time. Couple of the images captured by drone shows presence of birds over the landfill site.



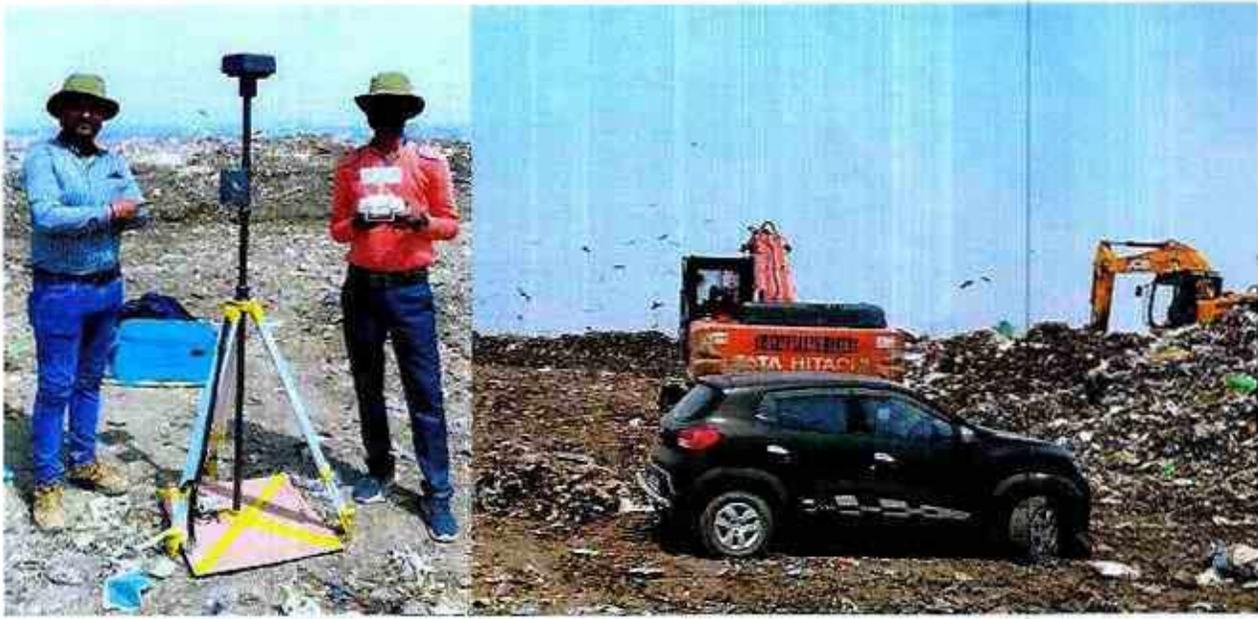
### 2.3.2 Continuous operation of trucks, movement of people (rag pickers)

Continuous operation of JCBs and other machinery was observed at the landfill site. There is regular movement of trucks within the landfill site. Also noticed the presence of rag pickers, including children, atop the landfill busy with their work.



### 2.3.3 Smell and Dust

The landfill site is marked with stinking and foul smell. Moreover, due to movement of trucks and other machineries deployed onsite, there is too much of dust in the air. During the drone survey, the Consultant's team took all precautions like use of protective gear, sanitizer and following other hygiene protocols.



### 3 Output

#### 3.1 Orthophoto

As per the records/reports available and discussions with MCD officials, the site area of SLF Ghazipur is reported as 70 acres (about 28 Ha.). However, during the survey it is observed that the actual site area is about 75 acres (about 30 Ha.). The site boundary is presented in Figure 5. The site area has increased by 7% thereby resulting in significant increase in survey and processing time over what was originally envisaged.

Figure 5: SLF Ghazipur Site Boundary



Map Title  
Ghazipur SLF Site  
Boundary  
(Scale: 1:10,000)

Legend

0 10 20 30 40

North Arrow

Prepared by  
Caritas Eco Systems Pvt. Ltd.  
(Member of IIT Bombay)

Checked by  
Caritas Eco Systems Pvt. Ltd.

Caritas Eco Systems Pvt. Ltd.  
www.caritaseco.com

Scale  
1:10,000

For the purpose of waste volume estimation and analysis of SLF, the area occupied by buildings and at the entrance has been excluded. The analysis is focused on an area of 75 acres. The same is represented in Figure 6. The boundary shown in the red has been used for determining the volume and the base level height is 200 meters above mean sea level.

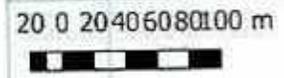
*Figure 6: SLF Boundary used for Analysis*





Map Title:  
Ghazipur SLF Dimension  
Map  
(Status as of 10 June  
2022)

Legend



Project:  
Change Detection and  
Volumetric Assessment of  
Ghazipur SLF using Drone  
Survey

Client:  
Municipal Corporation of  
Delhi



Consultant:  
Caritas Eco Systems



Date: 8th July 2022

3.2 3D Image

Some images of processed 3D model of the Sanitary Landfill Site.

Figure 7: Top View of the Sanitary Landfill Site, Ghazipur





Figure 8: SLF Ghazipur (West Side View)



Figure 9: SLF Ghazipur (East Side View)



Figure 10: SLF Ghazipur (North west Side View)

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Figure 11: SLF Perspective View 1



Figure 12: SLF Perspective View 2



### 3.3 Topographical Analysis

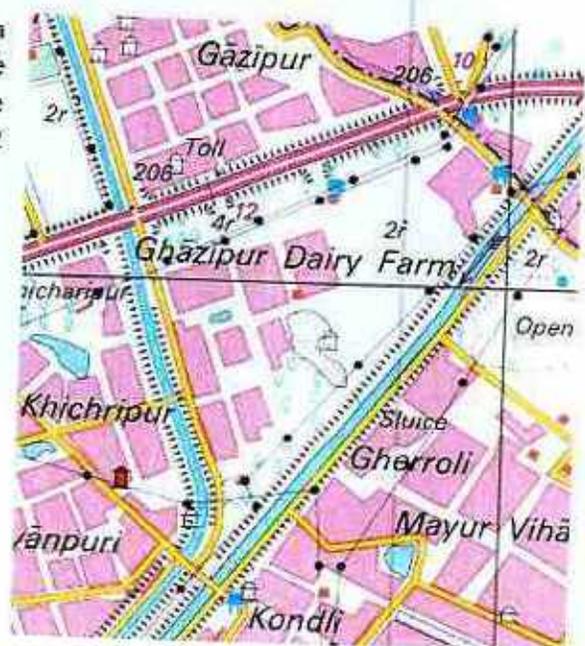
The open dumpsite has been in operation for many years and waste has spread all over an area of almost 75 acres well beyond the originally planned or officially recorded area of about 70 acres. It is noted that due to lack of original ground survey data (prior to dumping) and the subsequent waste dumping over the years, the original ground profile of the site is not known. The consultants collected historic images to trace the growth and development of the landfill through the years. It may be seen that the site appeared almost flat in the year 1985 and the height of the waste dump has grown over years.



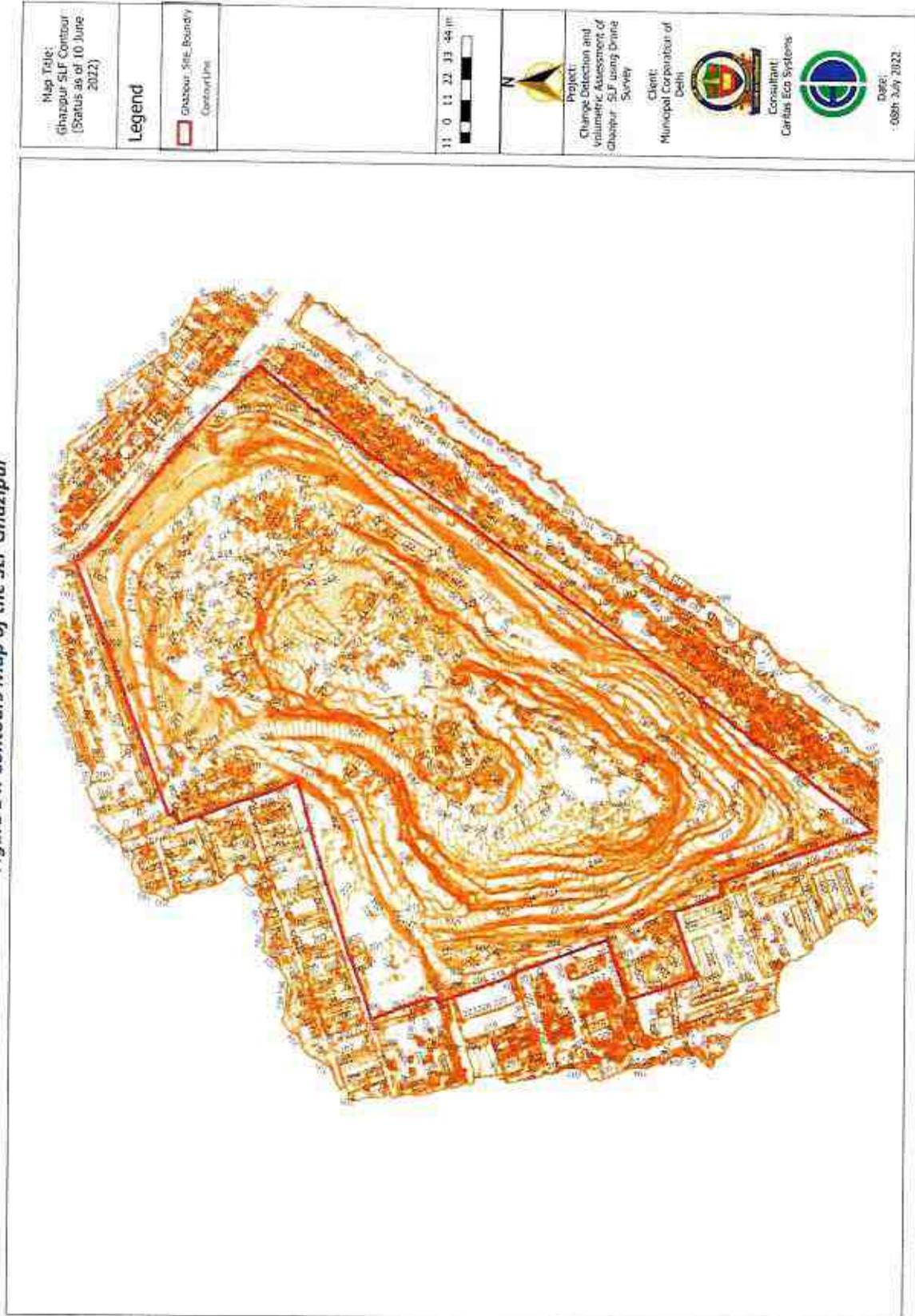
Figure 13: SLF Imagery 2000

Source: Google Earth

In the absence of any survey data, reference has been taken from the toposheet and the output generated by the Consultant has been used for this project. As per the toposheet, the contours along the site boundary is at 202 meters above mean sea level.



Based on the aerial survey data, a Digital Surface Model (DSM) was generated. Based on the DSM, contours were extracted and are presented in Figure 15  
Figure 14: Contours Map of the SLF Ghazipur



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### 3.4 Slope Analysis

*Slope analysis is an important tool to understand the stability of an area. Based on the existing ground profile of the landfill site, slope analysis is presented in the*

*It is observed that in general the slope varies from 30° to 45°. It is represented with green colour. However, there are steep slopes in the range of 45o to 60o and at places due to excavation, the slope is up to 90o. These areas are like cliffs in the landfill site and are represented with red colour. Slope variation in degree is presented through 15 to 20.*

Figure 15: Height at section AB

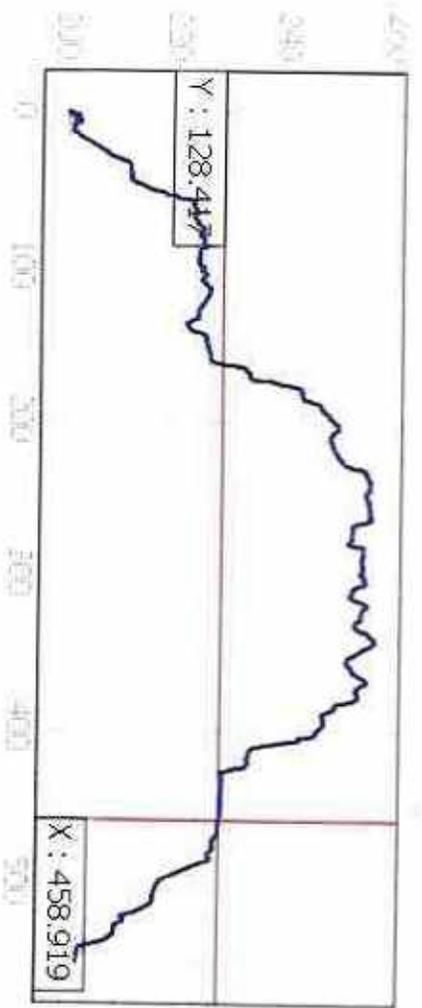
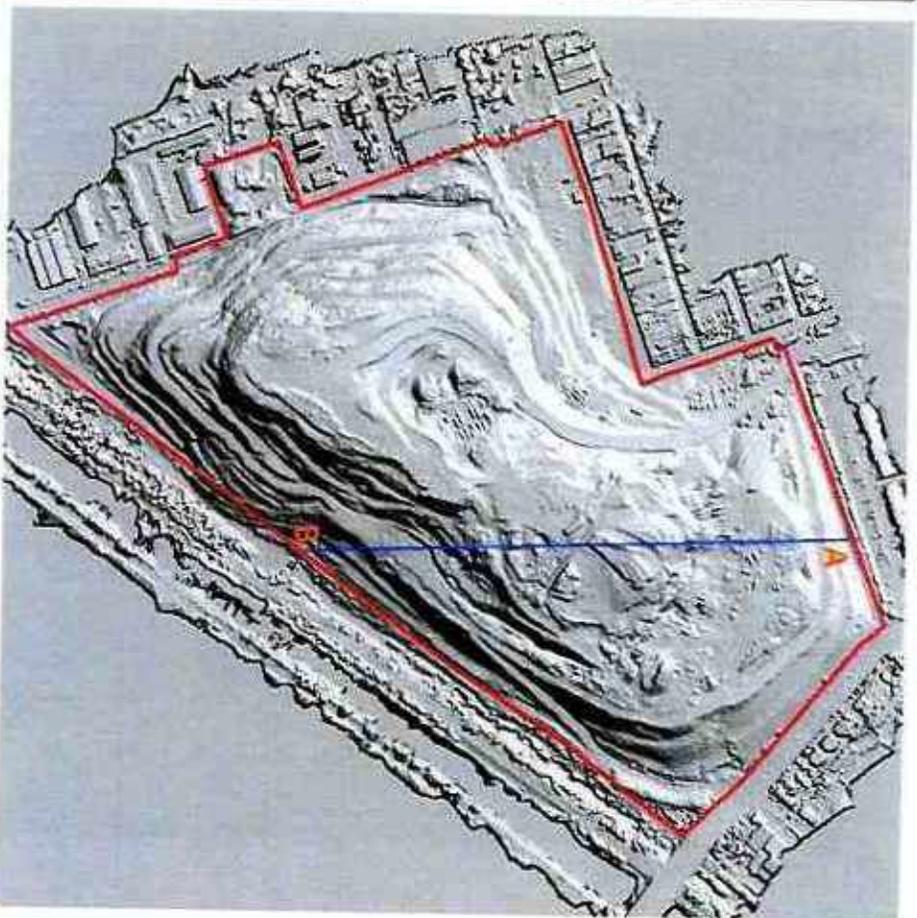
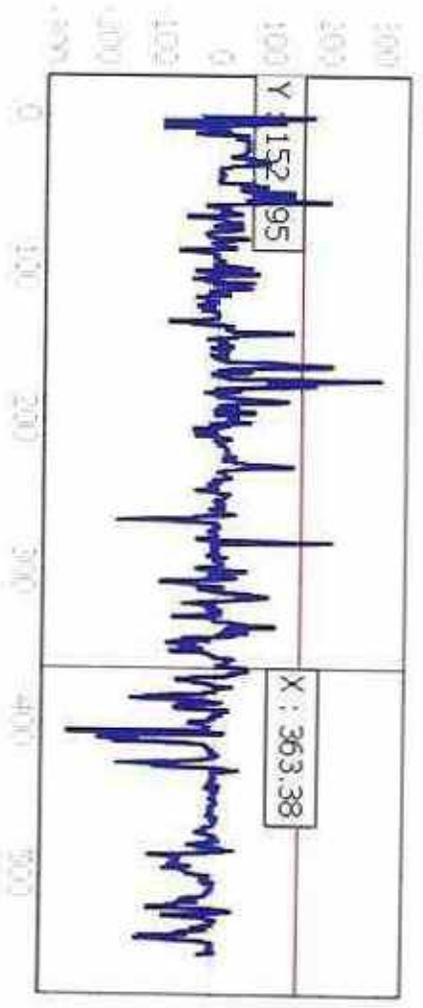


Figure 16: Slope Variation In Degree along Section AB



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Figure 17: Height variation in CD

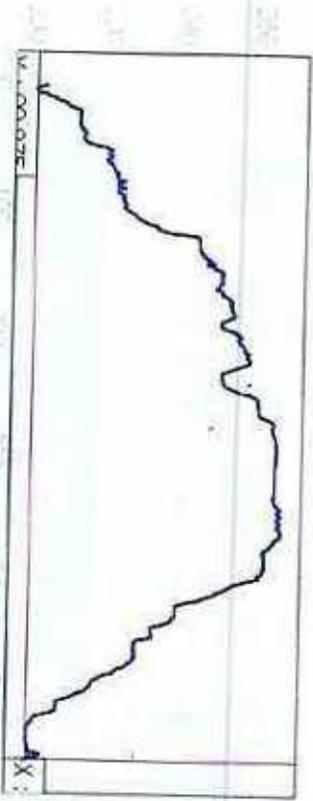
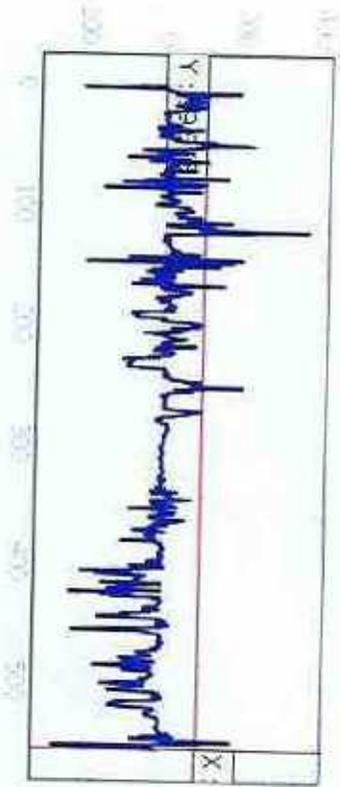


Figure 18: Slope Variation in Degree along Section CD



Change Detection and Volumetric Assessment of Ghazipur SLF Using Drone Survey

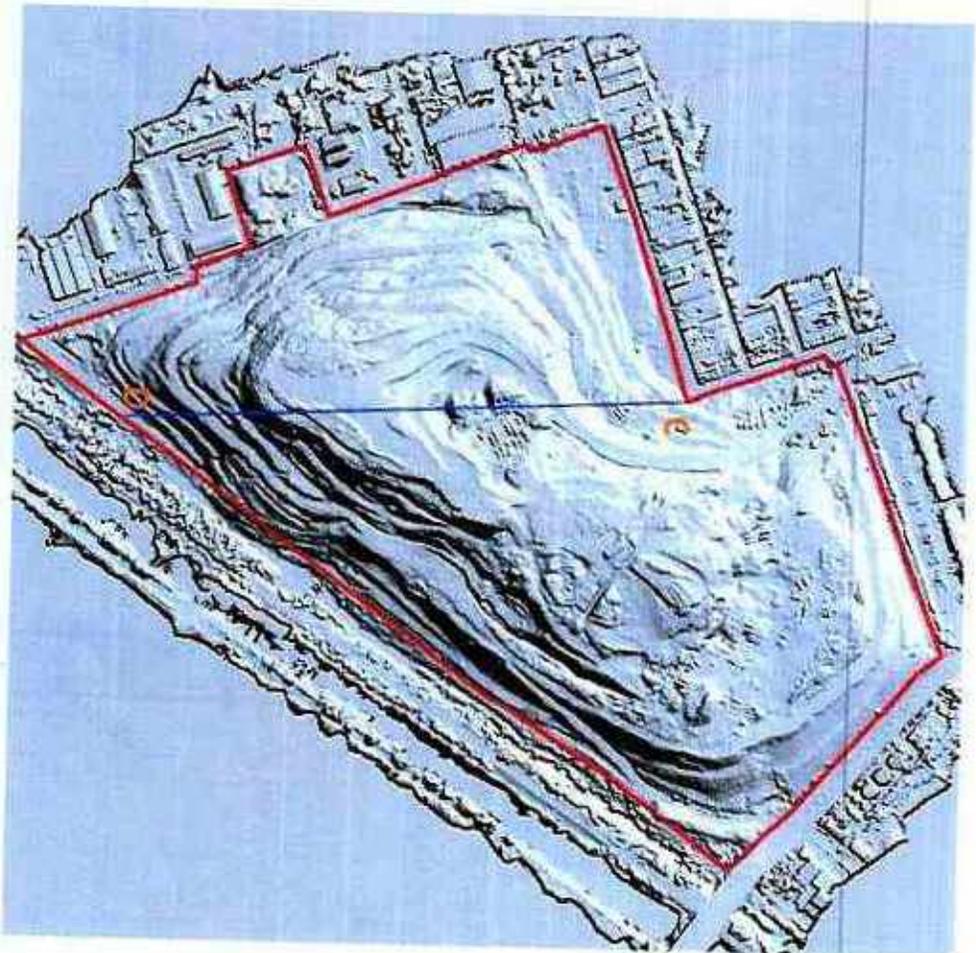


Figure 19: Height variation in EF

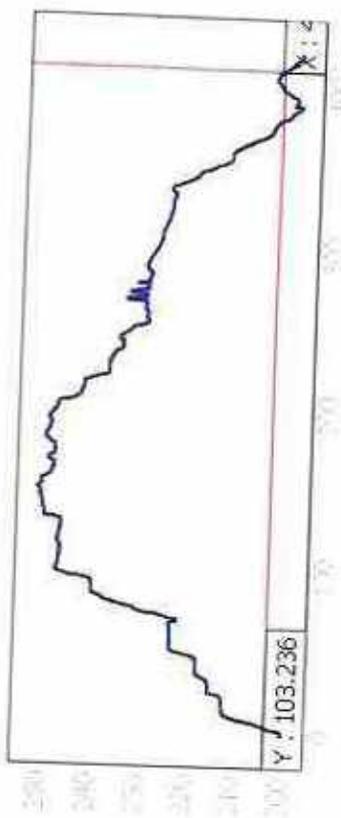
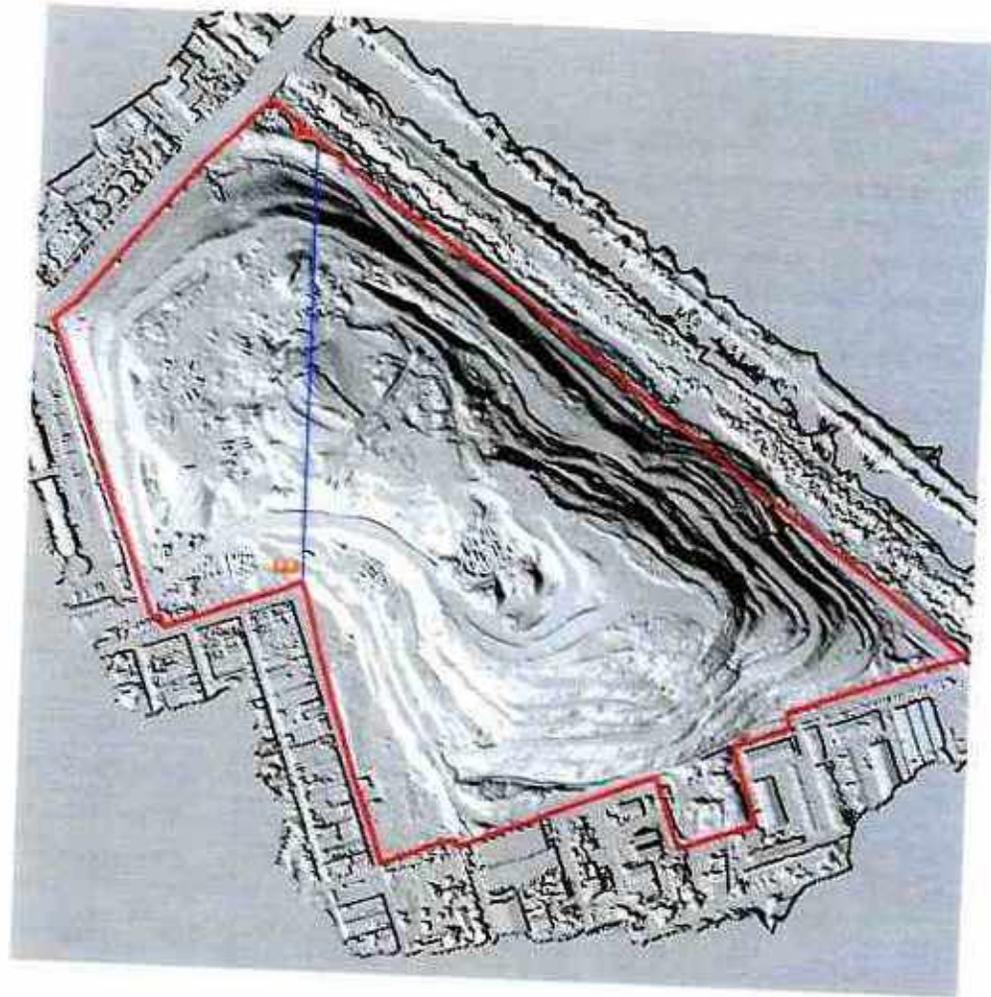
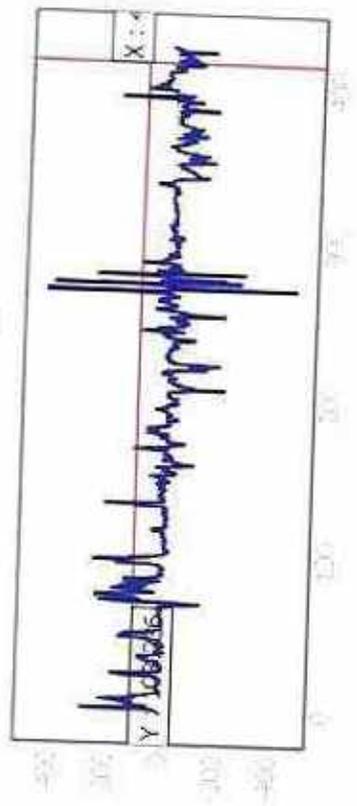


Figure 20: Slope Variation in Degree along Section EF



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### 3.5 Volumetric Assessment

As an output of the drone survey the consultants generated a 3D surface model of the existing waste mound at the site using photogrammetric analysis. This generated surface has been used to for estimation of the enclosed volume. It is observed that the natural ground is sloping towards east. It can be seen from the contour survey that waste has reached a height of 65 m from the ground. The highest point being more than 267 m.

The Consultant has estimated the waste volume with the following assumptions.

1. Average original level of the site being 200 m based on the toposheet
2. The level was taken at the original level of the area adjacent to the SLF which varies from 200-202 meters above mean sea level.

Volume estimation is presented in Table 1.

**Table 1: SLF Waste Volume Estimate**

SLF site area	75.08 Acres	30.308 Ha.
SLF site area considered for volumetric assessment	73 Acres	29 Ha
Waste volume @ 200 m baseline level	83.0 Lakhs Cubic meters	
Waste volume @ 202 m baseline level	77.5 Lakh Cubic Meter	
Maximum Height @202 m base level	65 meters	
Maximum Height @200 m base level	67 Meters	

### 4 Way Forward

The Consultant has estimated the waste volume, presented in Table 1 above, as on 15 June 2022. As per discussion with MCD officials, the Consultant will conduct the aerial survey again in the month of September 2022. In the next submission, the Consultant would be able to undertake the change detection whereby highlighting the change in the waste volume, slope and general topography of the site. This would be helpful for MCD to monitor the progress and plan its activity accordingly.



**Municipal Corporation of Delhi**  
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19<sup>th</sup> Level Dr. SPM Civic Centre, JLN Marg  
New Delhi-110001



No. CE(Project/DEMS)/MCD/2022-23/D- 25

Dated: 05/08/2022

**Subject: -** Regarding creating the facility for composting/ disposal of MSW generated by mass generator.

Sir,

Ghazipur landfill site has been operational since 1984. A huge quantity of MSW/ legacy waste has been accumulated in a height of 65 mtrs at landfill site. At present it has crossed its saturation level. Now this landfill site is not in a position to take further waste material from your organization.

It is also pertinent to mention here that the above issue was discussed in the meeting of committee under Hon'ble Justice (retired) Sh. SP Garg constituted by Hon'ble NGT vide order dt. 22.04.2022 in OA 288 / 2022 related to Ghazipur Landfill. In the meeting, it was directed that the mass generators of waste be asked to create their own facilities for composting/ bio-methanization of the waste generated by the bulk generators.

Since you are a bulk generator of waste, it is therefore requested to comply the directions of the committee constituted by Hon'ble NGT to make your own arrangement for scientific disposal of your waste as per SWM- Rules 2016 immediately.

This may be treated as "MOST URGENT".

Chief Engineer (Project/DEMS)

1. The Asstt. Secretary, Delhi Fish, Poultry & Egg Market Committee, (Govt. of NCT Delhi), Shaheed Ashfque Ullah Khan Fish Market, Ghazipur, Delhi-110096.
2. The Secretary, Flower Marketing Committee, IFC Ghazipur.
3. The Secretary, Agriculture Produce Marketing Committee, Fruit and Vegetable Market Committee Shahdara, Ghazipur, Delhi-110096
4. Dy. Manager (Conservancy), India Trade Promotion Organization (ITPO), Pargati Maidan, New Delhi-110001.

Copy to:-

1. E-in-C-II for kind information pl.
2. SE (SLF) Ghazipur
3. SE/Elect (SLF) Ghazipur
4. Office Copy.

Chief Engineer (Project/DEMS)