BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL

OA No. 75/2023

IN THE MATTER OF:

Jayshree Bansal ... Petitioner

Versus

State of UP & Others ...Respondents

INDEX

S. No.	PARTICULARS	PAGE No.
1.	Action taken Report	
2.	**ANNEXURE R-1** Departmental ATR by the District Health Officer	
3.	**ANNEXURE R-2** Minutes of the 9th Meeting dated 10.12.2022 of the Swatchh Bharat Mission regarding Solid Waste Management	
4.	**ANNEXURE R-3** Detailed Project Report For "Scientific Dumpsite Land Reclamation through Bio-mining and Resource Recovery at Ghaziabad City" Under Ghaziabad Nagar Nigam	

Municipal Commissioner

Through Counsel

(VIBHAV MISHRA)
Ch: 221, C.K. Daphtary Block, Tilak Lane,
Supreme Court of India, New Delhi-110001
(M): 9473565666/9811828487
(e):vibhavmishra@outlook.in

Date: 14.03.2023
Place: New Delhi

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL

OA No. 75/2023

IN THE MATTER OF:

Jayshree Bansal ... Petitioner

Versus

State of UP & Others ...Respondents

ACTION TAKEN REPORT

MOST RESPECTFULLY SHOWETH:

1. That the above captioned matter was listed before this Hon'ble Tribunal on 10.02.2023, wherein this Hon'ble Tribunal was pleased to pass the following order:

> *"...Dumping can be only of residual part after processing. The photographs suggest that unprocessed waste is being dumped which needs to be verified by the Ghaziabad Nagar Nigam and remedial action taken. Ghaziabad Nagar Nigam may give an action taken report to this Tribunal on or before 15.03.2023 by e-mail at judicialngt@gov.in preferably in the form of searchable PDF/ OCR Support PDF and not in the form of Image PDF with factual status of area of land occupied, quantity of waste already deposited (legacy waste) at the site, current quantity of waste being dumped per day, status of waste processing facility and authorization under the Rules. If found necessary, the report may be placed before the bench for further directions.*

Subject to above directions, the application is disposed of.

Copy of this order be forwarded to Ghaziabad Nagar Nigam by email for compliance. The applicant may serve a copy of application on Ghaziabad Nagar Nigam and file an affidavit of service within one week.

2. That pursuant to the above order, the District Health Officer (Nagar Swasthya Adhikaari) of the Ghaziabad Nagar Nigam submitted a report to the Municipal Commissioner Ghaziabad, for filing and appraising the accompanying above to the Hon'ble Tribunal for the works carried out and Detailed Plan of Action, which have been taken and is intended to be taken in coming months to remedy the disposal of Waste in Ghaziabad.
3. That the departmental ATR by the District Health Officer is annexed herewith and marked as **ANNEXURE R-1**.
4. That the minutes of the 9th Meeting dated 10.12.2022 of the Swatchh Bharat Mission regarding Solid Waste Management wherein which, Agenda Note-3 for the treatment of Legacy Waste of Ghaziabad, Aligarh and Ayodhya is annexed herewith and marked as **ANNEXURE R-2**.
5. That the "Detailed Project Report For "Scientific Dumpsite Land Reclamation through Bio-mining and Resource Recovery at Ghaziabad City" Under Ghaziabad Nagar Nigam"

(Edn December 2022) is annexed herewith and marked as **ANNEXURE R-3**.

6. That the Municipal Corporation, Ghaziabad is tediously working round the clock for the disposal of the legacy waste and making an attempt to remedy the issue of pollution as soon as possible and committed to make Ghaziabad clean and green.

Municipal Commissioner

Through Counsel

(VIBHAV MISHRA)
Ch: 221, C.K. Daphtary Block, Tilak Lane,
Supreme Court of India, New Delhi-110001
(M): 9473565666/9811828487
(e):vibhavmishra@outlook.in

Date: 14.03.2023
Place: New Delhi

ANNEXURE R-1

अपर नगर आयुक्त/वरि0प्र0स्वा0 महोदय

कृपया नगर आयुक्त महोदय के कार्यालय से प्राप्त पत्रांक:202/एनजीटी/2022–23 दिनांक 20.02.2023 जिसमें मा0 राष्ट्रीय हरित अधिकरण, नई दिल्ली के समक्ष योजित ओ0ए0 सं0 75/2023 जयश्री बंसल बनाम मिनिस्ट्री ऑफ एन्वायरमेंट, फोरेस्ट एवं क्लाईमेट चेंज व अन्य जिसमें वाद का सम्बन्ध ग्राम जगजीवनपुर परगना जलालाबाद तहसील एवं जनपद गाजियाबाद की भूमि पर गाजियाबाद नगर निगम द्वारा सॉलिड वेस्ट डम्प किये जाने पर तथा उससे उत्सर्जित जहरीली गैस के कारण वादी की भूमि पर प्रदूषित होने के सम्बन्ध में योजित की गयी है। मा0 अधिकरण द्वारा दिनांक 10.02.2023 को उक्त प्रकरण पर सुनवाई करते हुये निम्नलिखित निर्देशो के साथ निस्तारित कर आदेश पारित किये गये है। जिसके कियात्मक अंश निम्नवत हैः–

The Photographs suggest that unprocessed waste is being dumped which needs to be verified by the GNN and remedial action taken. GNN may give an action taken report (ATR) to this Tribunal on or before 15-03-2023 by e-mail at judicialngt@gov.in preferably in the form of searchable PDF/OCR Support PDF and no in the form of image PDF with factual status of area of land occupied, quantity of waste already deposited (legacy Waste) at the site, current quantity of waste being dumped per day, status of waste processing facility and authorization under the Rules. If found necessary, the report may be placed before the bench for further directions.

उपरोक्त सम्बन्ध में विभागीय ATR निम्नवत है–

उक्त भूमि लगभग 7.25 एकड़ निजी कास्तकार की भूमि है, जिस पर वर्ष 2021–22 तक नगर निगम क्षेत्र से प्राप्त मिक्स ठोस अपशिष्ट का निस्तारण हेतु एकत्रीकरण कर प्रोसेसिंग किया जा रहा था, परन्तु प्रोसेसिंग की क्षमता कम होने के कारण उक्त भूमि पर नगरीय ठोस अपशिष्ट अधिक एकत्रित हो गया। माह सितम्बर 2022 से उक्त भूमि पर कूडा एकत्रीकरण का कार्य पूर्णरूप से बन्द कर दिया गया है तथा उपर्युक्त एकत्रित ठोस अपशिष्ट को लिगेसी वेस्ट की श्रेणी में रखते हुये इसकी डी0पी0आर0 तैयार करके शासन से बेटिंग के उपरान्त बायो–रेमेडिएशन के कार्य हेतु RFP तैयार कर ली गयी है। उक्त भूमि पर डी0पी0आर0 के अनुसार कुल लिगेसी वेस्ट की मात्रा–329936 एम0टी0 है। निविदा का कार्य प्रकिया में है। अगले 18–20 माह में उक्त कार्य पूर्ण कर लिया जायेगा।

संलग्नक–यथोक्त।

नगर स्वास्थ्य अधिकारी
नगर निगम गाजियाबाद

शासन के पत्र संख्या–5698(1)/नौ–5–2022–172सा/2019 दिनांक 08 दिसम्बर, 2022 द्वारा स्वच्छ भारत मिशन–नगरीय 1.0 के ठोस अपशिष्ट प्रबन्धन मद के अन्तर्गत अपर मुख्य सचिव/प्रमुख सचिव, नगर विकास विभाग, उत्तर प्रदेश शासन की अध्यक्षता में राज्य स्तरीय ठोस अपशिष्ट प्रबन्धन तकनीकी समिति की नवम् बैठक दिनांक 10.12.2022 को सम्पन्न बैठक का कार्यवृत्तः–

उपस्थितिः–बैठक में उपस्थित अधिकारीगण का विवरणः–

1– श्री अमृत अभिजात, प्रमुख सचिव, नगर विकास विभाग, उ0प्र0 शासन।
2– श्रीमती नेहा शर्मा, राज्य मिशन निदेशक, स्वच्छ भारत मिशन–नगरीय, उ0प्र0।
3– श्री संजीव गुप्ता, वित्त नियंत्रक, सूडा, उ0प्र0।
4– श्री अखिल सिंह, सहायक निदेशक (लेखा), नगरीय निकाय निदेशालय, उ0प्र0, लखनऊ।
5– श्री ए0के0 गुप्ता, अपर निदेशक, आर0सी0यू0ई0एस0, लखनऊ।
6– श्री नवीन गुप्ता, निदेशक, सी0एण्डडी0एस0, उ0प्र0 जल निगम, लखनऊ।
7– डॉ0 सुनील कुमार यादव, उप निदेशक, स्वच्छ भारत मिशन–नगरीय, उ0प्र0।
8– डॉ0 राजीव नारायन, उप निदेशक, आर0सी0यू0ई0एस0, लखनऊ।
9– श्री कमल सिंह, महाप्रबन्धक, सी0एण्ड डी0एस0, उ0प्र0 जल निगम, लखनऊ।
10– श्री गुरू प्रसाद पाण्डेय, सहायक मिशन निदेशक, स्वच्छ भारत मिशन–नगरीय, उ0प्र0।
11– श्री विकास रस्तोगी, के0पी0एम0जी0, स्वच्छ भारत मिशन–नगरीय, उ0प्र0।
12– श्री विपिन पटेल, मण्डल कार्यक्रम प्रबन्धक, स्वच्छ भारत मिशन–नगरीय, उ0प्र0।

सर्वप्रथम सहायक मिशन निदेशक, स्वच्छ भारत मिशन–नगरीय द्वारा समिति के समक्ष गत बैठक दिनांक 01.11.2022 में लिए गए निर्णयों के अनुपालन आख्या के विषयगत समिति को प्रगति से अवगत कराया गया।

1. **12 नगरीय निकायों यथा–नगर निगम लखनऊ, प्रयागराज, मेरठ, नगर पालिका परिषद गंगाघाट, अकबरपुर (अम्बेडकरनगर) हरदोई, लखीमपुर–खीरी, फर्रूखाबाद, चन्दौसी (सम्भल), सिकन्दराबाद (बुलन्दशहर), गोण्डा एवं नगर पंचायत मलिहाबाद (लखनऊ) में लिगेसी वेस्ट के निस्तारण के विषयगत प्रस्ताव।**
   उपरोक्त प्रस्तुत प्रस्तावों पर मा0 समिति द्वारा अनुमोदनोंपरान्त राज्य स्तरीय उच्चाधिकार संचालन समिति के समक्ष प्रस्ताव प्रस्तुत किये गये, जिस पर मा0 समिति द्वारा स्वीकृति प्रदान की गयी। अग्रेतर लखनऊ नगर निगम के स्वयं के अनुरोध व अन्य नगर पालिका परिषदों व नगर पंचायत के टेण्डर की कार्यवाही हेतु कार्यदायी संस्था सी0एण्डडी0एस0 को निर्देशित किया गया है। नगर निगम मेरठ को स्वयं टेण्डर प्रकाशन का कार्य किये जाने के निर्देश प्रदान किये गये व नगर निगम प्रयागराज द्वारा अनुरोधित VGF धनराशि के सापेक्ष प्रथम किश्त अवमुक्त किये जाने की कार्यवाही की गयी।
2. **31 नवगठित नगर पंचायतों को स्वच्छ भारत मिशन–नगरीय के कार्यों यथा–कूड़े के कलेक्शन एवं ट्रांसपोर्टेशन, मैटेरियल रिकवरी फैसेलिटी के अधिष्ठापन, ट्विन बिन डस्टबिन एवं प्रचार–प्रसार हेतु वित्त पोषित किये जाने का प्रस्ताव।**
   31 नवगठित नगर पंचायतों को उपरोक्त कार्यों हेतु वित्त पोषित किये जाने के प्रस्ताव पर मा0 समिति द्वारा अनुमोदन प्रदान किया गया। अग्रेतर मिशन निदेशालय द्वारा पृथक–पृथक भुगतान आदेशों के माध्यम से निकायों को वित्त पोषित किया गया है।
3. **61 सीमा विस्तारित क्षेत्रों की निकायों को कूड़े के कलेक्शन एवं ट्रांसपोर्टेशन के क्रय हेतु वित्त पोषित किये जाने का प्रस्ताव।**

उपरोक्त 61 सीमा विस्तारित क्षेत्रों की निकायों को उक्त कार्य हेतु वित्त पोषित किये जाने के प्रस्ताव मा0 समिति द्वारा अनुमोदन प्रदान किया गया। अग्रेतर मिशन निदेशालय द्वारा भुगतान आदेश के माध्यम से वित्त पोषित किया गया है। निकायों द्वारा क्रयदारी प्रक्रियाधीन है।

4. **05 नगरीय निकायों द्वारा कूड़े के कलेक्शन एवं ट्रांसपोर्टेशन के क्रय हेतु प्रेषित प्रस्ताव का अनुमोदन–**

उपरोक्त प्रस्तावों पर मा0 समिति द्वारा अनुमोदन प्रदान किया गया। नगर निगम बरेली के सम्बन्ध में अतिरिक्त धनराशि का सीमा आवंटन मिशन निदेशालय के पत्र संख्या–पी0एम0यू0/6929/427(12)/2022 दिनांक 06 दिसम्बर, 2022 द्वारा कर दिया गया है।

5. **226 नगरीय निकायों में वेट वेस्ट प्रोसेसिंग प्लान्ट के अधिष्ठापन हेतु वित्त पोषित किये जाने का प्रस्ताव।**

226 नगरीय निकायों में वेट वेस्ट प्रोसेसिंग प्लान्ट के अधिष्ठापन हेतु वित्त पोषित किये जाने के प्रस्ताव पर मा0 समिति द्वारा अनुमोदन प्रदान किया गया। अग्रेतर निकायों से उपयुक्त भूमि की सूचना प्रेषित किये जाने हेतु निर्देशित किया गया है एवं अग्रेतर निकायों द्वारा भूमि उपलब्धता की सूचना उपरान्त आर0सी0यू0ई0एस0 को 10 कार्यदिवसों में मानकीकृत ड्राइंग एवं डिजाइन तैयार कर मिशन निदेशालय को प्रेषित किये जाने के भी निर्देश प्रदान किये गये।

समिति द्वारा उक्त अनुपालन आख्या का संज्ञान लिया गया। तत्पश्चात् बिन्दुवार प्राप्त प्रस्तावों पर विचारोपरान्त निम्न निर्णय लिये गये।

एजेंडा नोट–1

स्वच्छ भारत मिशन–नगरीय 1.0 के अन्तर्गत प्रस्तुत प्रस्तावों पर राज्य स्तरीय उच्चाधिकार संचालन समिति से प्राप्त सैद्धान्तिक स्वीकृति उपरान्त मिशन निदेशालय स्तर से ही अग्रेतर कार्यवाही किये जाने का प्रस्ताव।

मा0 समिति के समक्ष संज्ञान में लाया जाना है कि स्वच्छ भारत मिशन–नगरीय 1.0 के अन्तर्गत ठोस अपशिष्ट प्रबन्धन के प्रस्तावों पर गठित राज्य स्तरीय तकनीकी समिति द्वारा अनुमति प्राप्त होने के उपरान्त मा0 राज्य स्तरीय उच्चाधिकार संचालन समिति के समक्ष प्रस्तुत किया जाता है। मा0 समिति द्वारा प्रस्तुत प्रस्तावों पर सैद्धान्तिक सहमति प्रदान किये जाने के उपरान्त उन प्रस्तावों को पुनः राज्य स्तरीय तकनीकी समिति के समक्ष प्रस्तुत किया जाता रहा है, जिससे अनावश्यक प्रस्तावों के वित्त पोषण एवं अग्रेतर कार्यवाही किये जाने में अत्यधिक समय व्यतीत होता है एवं समयावधि में कार्य पूर्ण नही हो पाते। अतः मा0 राज्य स्तरीय उच्चाधिकार संचालन समिति से सैद्धान्तिक स्वीकृति प्राप्त होने के उपरान्त प्रस्तावों को गतिशील बनाये जाने एवं समयावधि में कार्य पूर्ण कराये जाने हेतु मिशन निदेशालय स्तर से ही अग्रेतर कार्यवाही किये जाने का प्रस्ताव मा0 समिति के समक्ष विचारार्थ/अनुमोदनार्थ प्रस्तुत है।

मा0 समिति द्वारा उक्त प्रस्ताव को अस्वीकृत किया गया तथा यह निर्देश दिये गये कि निकायों अथवा कार्यदायी संस्था द्वारा प्रेषित प्रस्ताव को 15 दिवसों के भीतर प्रत्येक दशा में राज्य स्तरीय तकनीकी समिति के समक्ष प्रस्तुत कर स्वीकृत कराया जाय।

एजेण्डा नोट–2

04 नगरीय निकायों यथा–नगर पालिका परिषद पं0 दीन दयाल उपाध्याय नगर, मंझनपुर, बेल्हा प्रतापगढ़ व शिकोहाबाद में म्यूनिसिपल सॉलिड वेस्ट प्लान्ट के अधिष्ठापन हेतु कार्यदायी संस्था सी0एण्डडी0एस0 द्वारा तैयार प्राक्कलन पर अनुमोदन का प्रस्ताव।

सी0एण्डी0एस0, उ0प्र0 जल निगम के पत्र संख्या–240/निदे0कै सा0वे0मै0/15 दिनांक 09.12.2022 द्वारा अवगत कराया गया है कि राज्य मिशन निदेशक, स्वच्छ भारत मिशन–नगरीय, लखनऊ के पत्र संख्या पी0एम0यू0/6129/429(15)/2019 दिनांक 15.07.2022 द्वारा 09 नगरीय निकायों में ठोस अपशिष्ट प्लाण्ट स्थापित किये जाने हेतु 9 निकायो यथा पं0 दीनदयाल उपाध्याय नगर (चन्दौली), मंझनपुर (कौशाम्बी), शिकोहाबाद (फिरोजाबाद), बेल्हा प्रतापगढ (प्रतापगढ़), देवबन्द (सहारनपुर), भरवारी (कौशाम्बी), महोबा, अकबरपुर

(अम्बेडकरनगर) एवं हाटा (कुशीनगर) में निकाय द्वारा उपलब्ध भूमि करायी गयी। भूमि की उपयुक्तता के सम्बन्ध में सम्मिलित आख्या के उपरान्त प्लाण्ट के अधिष्ठापन हेतु प्राक्कलन विरचन के निर्देश प्राप्त हुए थे, जिनमे से पं0 दीनदयाल उपाध्याय नगर (चन्दौली), मंझनपुर (कौशाम्बी), शिकोहाबाद (फिरोजाबाद) एवं बेल्हा प्रतापगढ़ (प्रतापगढ़) के प्राक्कलन गठित करके प्रेषित किया गया था किन्तु दिनांक 02.11.2022 को आहूत राज्य स्तरीय उच्चाधिकार संचालन समिति की बैठक में उक्त 4 निकायों के प्राप्त प्रस्तावों को निरस्त करते हुए निर्देशित किया गया था कि म्यूनिसिपल सॉलिड वेस्ट प्लान्ट के सिविल निर्माण के साथ–साथ सूखे एवं गीले कूड़े का अलग–अलग निस्तारण वैज्ञानिक पद्धति से कराया जाय। तद्नुसार सी0एण्डी0एस0 द्वारा उपरोक्त 4 निकायों की डी0पी0आर0 उपरोक्त निर्देशों के अनुसार प्रस्तुत की गयी है, जिसका विवरण निम्न तालिका में अंकित है:–

(धनराशि रू0 लाख में)

क्र0सं0	जनपद	नगरीय निकाय का नाम	सी0एण्ड डी0एस0 द्वारा गठित प्रारम्भिक आगणन की लागत (जी0एस0टी0, लेबरसेस एवं सेन्टेज सहित)	आर0सी0यू0ई0एस0, लखनऊ द्वारा परीक्षणोपरान्त लागत (जी0एस0टी0, लेबरसेस एवं सेन्टेज सहित)
1	चन्दौली	पं0 दीनदयाल उपाध्याय	865.40	822.23
2	कौशाम्बी	मंझनपुर (न0पा0परि0)	848.38	807.29
3	प्रतापगढ़	बेला प्रतापगढ़ (न0पा0परि0)	1029.07	828.67
4	फिरोजाबाद	शिकोहाबाद(न0पा0परि0)	1053.59	869.10
कुल योग			**3796.44**	**3327.29**

अतः उपरोक्त निकायों यथा पं0 दीनदयाल उपाध्याय नगर (चन्दौली), मंझनपुर, (कौशाम्बी), शिकोहाबाद (फिरोजाबाद) एवं बेल्हा प्रतापगढ (प्रतापगढ़) में ठोस अपशिष्ट प्रबन्धन के अधिष्ठापन हेतु सिविल कार्यो के लिये गठित प्राक्कलन आर0सी0यू0ई0एस0 से परीक्षणोपरान्त कुल लागत **रू0 3327.29 लाख (जी0एस0टी0, लेबरसेस एवं सेन्टेज सहित)** अनुमोदन हेतु प्रस्तावों पर समिति के समक्ष विचार/निर्णय हेतु निवेदित है।

मा0 समिति द्वारा उपरोक्त प्रस्तावों पर अनुमति प्रदान की गयी एवं अग्रेतर राज्य स्तरीय उच्चाधिकार संचालन समिति के समक्ष प्रस्तुत किये जाने के निर्देश प्रदान किये गये व भूमि उपलब्धता के विषयगत मा0 मुख्य सचिव महोदय के समक्ष जिलाधिकारियों से संवाद किये जाने के भी निर्देश दिये गये।

एजेण्डा नोट–3

6 नगरीय निकायों यथा–नगर निगम गाजियाबाद, अलीगढ़, अयोध्या व नगर पालिका परिषद जौनपुर, सुलतानपुर व दादरी में लिगेसी वेस्ट के निस्तारण के विषयगत प्रस्ताव।

लिगेसी वेस्ट के निस्तारण हेतु उपरोक्त निकायों द्वारा थर्ड पार्टी सर्वे के आधार पर डी0पी0आर0 तैयार कर प्रेषित किया गया है। प्राप्त प्रस्तावों के पुनरीक्षण (Vetting) का कार्य रिसोर्स सेन्टर आर0सी0यू0ई0एस0, लखनऊ द्वारा किया गया है। प्राप्त डी0पी0आर0 एवं वेटिंग उपरान्त अनुमानित लागत का विवरण निम्नवत् है:–

क्रमांक	निकाय का नाम	लिगेसी वेस्ट की मात्रा (टन में)	डी0पी0आर0 की अनुमानित लागत धनराशि (रू0 में)	आर0सी0यू0ई0एस0 द्वारा वेटिंग उपरान्त लागत धनराशि (रू0 में)
1	नगर निगम गाजियाबाद	269000	9,11,00,000.00	13,41,28,013.00
2	नगर निगम अलीगढ़	447912	20,48,55,186.00	20,48,55,186.00
3	नगर निगम अयोध्या	51700	2,29,54,804.44	2,68,83,755.00

4	नगर पालिका परिषद जौनपुर	74869	4,30,44,088.00	4,30,44,088.00
5	नगर पालिका परिषद सुलतानपुर	51237	2,68,68,025	2,68,68,444.00
6	नगर पालिका परिषद दादरी	75000	69,01,000.00	1,52,13,073.00
कुल योग		**969718**	**39,57,23,103.44**	**45,09,92,559.00**

उपरोक्तानुसार प्राप्त प्रस्ताव मा0 समिति के समक्ष अनुमति हेतु प्रस्तुत किया गया।

मा0 समिति द्वारा उपरोक्त प्रस्तावों को इस शर्त के साथ अनुमति प्रदान की गयी कि लिगेसी वेस्ट की मात्रा का आगणन सेटेलाइट इमेजनरी, कन्टूर सर्वे एवं वेइंग मे से, जो भी कम हो, के माध्यम से सुनिश्चित किया जाये एवं आर0एफ0पी0 में निहित सभी शर्तों का अनुपालन शत–प्रतिशत सुनिशिचित हो।

अतिरिक्त निर्देशः–

प्रमुख सचिव महोदय द्वारा निर्देश दिये गये हैं कि लिगेसी वेस्ट के निस्तारण स्थल पर कैमरा लगाकर प्रतिदिन निरीक्षण का कार्य किया जाय एवं यह सुनिश्चित किया जाय कि निस्तारण स्थल से उत्पन्न हुये आर0डी0एफ0 एवं वेस्ट को किसी दूसरे डम्प साइट पर न फेंका जाय व सम्पूर्ण लिगेसी के निस्तारण उपरान्त स्थल को साइन बोर्ड के माध्यम से वेस्ट फ्री जोन घोषित कर उसकी तार फैसिंग कर भूमि को सुरक्षित किया जाय एवं निस्तारित स्थल के प्रचार प्रसार का भी कार्य कराया जाय।

अंत में बैठक सधन्यवाद सम्पन्न हुई।

(नेहा शर्मा)
राज्य मिशन निदेशक

राज्य मिशन निदेशालय
स्वच्छ भारत मिशन–नगरीय
पत्र संख्या–पी0एम0यू0/ 7357 **/547/2022 दिनांक** 10 जनवरी 2023
उ0प्र0 लखनऊ।

प्रतिलिपिः–निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषितः–

1– प्रमुख सचिव, नगर विकास विभाग (अनुभाग–5), उ0प्र0 शासन।
2– संबंधित मण्डलायुक्त, उ0प्र0।
3– निदेशक, नगरीय निकाय निदेशालय, उ0प्र0, लखनऊ।
4– संबंधित जिलाधिकारी, उ0प्र0।
5– संबंधित नगर आयुक्त, नगर निगम, उ0प्र0।
6– निदेशक, सी0एण्डडी0एस0, उ0प्र0 जल निगम, लखनऊ।
7– अपर निदेशक, क्षेत्रीय नगर एवं पर्यावरण अध्ययन केन्द्र, लखनऊ।
8– वित्त नियन्त्रक, सूडा, अपर निदेशक, आन्तरिक लेखा परीक्षा निदेशालय।
9– सहायक निदेशक (लेखा), नगरीय निकाय निदेशालय, उ0प्र0 लखनऊ।
10– संबंधित अधिशासी अधिकारी, नगर पालिका परिषद/नगर पंचायत, उ0प्र0।
11– गार्ड फाइल।

(नेहा शर्मा)
राज्य मिशन निदेशक

ANNEXURE R-3

DETAILED PROJECT REPORT

For

"Scientific Dumpsite Land Reclamation through Bio-mining and Resource Recovery at Ghaziabad City"

Under Ghaziabad Nagar Nigam

GHAZIABAD NAGAR NIGAM

GHAZIABAD

(UTTAR PRADESH, INDIA)

Dec 2022

Table of Contents

List of Tables

List of Figures

ACRONYMS

BOQ : Bill of Quantities
BOT : Build Operate Transfer
CapEx : Capital Expenditure
CBO : Community Based Organization
CPCB : Central pollution Control Board
DPR : Detail Project Report
GoI : Government of India
HPC : High Power Committee
IEC : Information, Education and Communication
MT : Metric Tonnes
MoUD : Ministry of Urban Development
MSW : Municipal Solid Waste
MSWM: Municipal Solid Waste Management
NGO : Non-Governmental Organization
NH : National Highway
O&M : Operation and Maintenance
PPP : Public Private Partnership
RCUES : Regional Centre for Urban and Environmental Studies
RWA : Resident Welfare Association
RFID : Radio Frequency Identification
SBM : Swatch Bharat Mission
SH : State Highway
SHG : Self-Help Group
SLF : Sanitary Landfill Facility
TPD : Tons per Day
MT : Metric Ton
ULB : Urban Local Body
WPF : Waste Processing Facility
WPSLF: Waste Processing & Sanitary Landfill Site

1 Introduction

1.1 Background

Urban India accounts for a third of India's population and generates 54.75 million Tonnes of municipal solid waste annually. The most prevalent method of disposal of this waste has been open dumping, for most of India's history. The accelerated growth of urban population and increasing economic activities rule out the viability of this method any longer. Swachh Bharat Mission since 2014 has introduced several scientific methods in MSWM. Environmental adjudication has also mandated the scientific remediation of dumpsites. The fact that many old dumpsites and landfills in the country pose threat to public health and the environment necessitates action to remediate dumpsites and reclaim the land being degraded.

After decades of use, these open dumps have grown larger and higher, becoming huge point sources of pollution. Waste rotting in these dumps produces leachate, a foul dark liquid concentrate that kills vegetation in its path and irreversibly pollutes groundwater. The heaps of garbage also produce methane, a greenhouse gas that causes 21 times more global warming than carbon dioxide. Methane often auto-ignites, causing fires in the dumpsites, generating smoke and emissions thereby severe air pollution.

It is estimated that more than 10,000 hectares of urban land is locked in these dumpsites in India. In the absence of exposure to air, these dumpsites in the absence of oxygen generate methane (a greenhouse gas) and other landfill gases, which contribute to global warming. They also produce leachate (liquid generated by dumped) waste) which pollutes groundwater. Frequent outbreaks of fire at the dumpsites lead to air pollution. The presence of these dumps encourages further dumping at these sites, even though they are filled beyond capacity to take any more waste.

The need for remediation of these dumpsites is directed by NGT Order in OA519/2019 dated 17/7/2019 on Remediation, the observation being the following (gist only-not verbatim).

"Where bio-mining and bioremediation is possible, both ex-situ and in-situ, such options can be exercised, which is not only environmentally safe but cost effective". There may be hardly any situation when bioremediation is not possible.

The option of capping of legacy wastes, which has huge environmental and health consequences, is no option at all, except for inert waste, which again is to be disposed in a scientific secured landfill"

The order further traces the magnitude of the problem as follows:

As per Annual Report of the CPCB (2016-2017), there are 2120 Legacy waste dumpsites in India across 23 States: (as per MoHUA MIS data 1,764 dumpsites are recorded. The figure 2120 may include the under construction and existing SLF also, which do not reauire remediation)

The NGT orders for actions by States & ULBs may be mentioned as 1. Bioremediation and Biomining of dumpsites should be the preferred option. 2. Cities with more than 10 lakh population need special localized solutions.

The Solid Waste Management Rules of 2016 directed Urban Local Bodies to clear legacy waste dumps as well as existing operational dumpsite down to pre-existing ground level through a process called bioremediation or biomining, which refers to an environment-friendly technique to separate soil and recyclables from legacy waste.

1.2 Provision of SWM Rules, 2016

The Government of India has notified the Solid Waste Management Rules (SWM) Rules, 2016 for proper and effective management of municipal solid waste (MSW). Under the SWM Rules, 2016, following provisions have been made to manage old dumps of MSW Rule 15 - Duties and responsibilities of local authorities and village Panchayats of census towns and urban agglomerations.

The local authorities shall,

- *Investigate and analyze all old open dumpsites and existing operational dumpsites for their potential for bio-mining and bioremediation and wherever feasible, take necessary actions to bio-mine or bio remediate the sites.*
- *In absence of potential of bio-mining and bioremediation of dumpsites, they shall be scientifically capped as per landfill capping norms to prevent further damage to the environment.*
- *Further, provisions under Schedule I (j) are given below:*
  - Schedule-I(j)-Closure and Rehabilitation of Old Dumps- Solid waste dumps which have reached their full capacity or those which will not receive additional waste after setting up of new and properly designed landfills should be closed and rehabilitated by examining the following options:
    1. Reduction of waste by bio-mining and waste processing followed by placement of residues in new landfills or capping as in (ii) below
    2. Capping with solid waste cover or solid waste cover enhanced with geomembrane to enable collection and flaring/ utilization of greenhouse gases
    3. Capping as in (ii) above with additional measures (in alluvial and other coarse-grained soils) such as cut-off walls and extraction wells for pumping and treating contaminated ground water.
    4. Any other method suitable for reducing environmental impact to acceptable level.

1.3 Need for the project

Ghaziabad Nagar Nigam is currently facing issues with legacy waste management of its dumpsites. The issues currently faced with the dumpsites are as under:

1. Space Constraints & Land Reclamation:
2. Landfill fires due to methane generation from biodegradable waste

3. Untreated leachate due to no or poor O&M of leachate collection and treatment
4. Soil, Ground and Air Pollution
5. Public agitation and protests
6. Lack of technical knowhow for existing dumpsites

As such, Ghaziabad Nagar Nigam is looking for solutions for legacy waste management for the dumpsites.

1.4 Objectives

The broad objectives of the detailed project report (DPR) are to determine a technically and economically viable solid waste management project for dumpsite remediation for Ghaziabad Nagar Nigam. Following are the specific objectives:

1. To devise a system for effective and efficient method of legacy waste management
2. To assess project feasibility
3. To assess environmental impact assessment of the project
4. Cost estimate
5. To prepare operational plan

1.5 Scope & Limitation of the study:

1. The study is limited to Ghaziabad Nagar Nigam area only
2. The study is limited to legacy waste management only

1.6 Approach and Working Methodology

Approach towards the study and working methodology adopted include planning, designing & preparation of detailed project report including detailed design and cost estimates etc. conforming to GOI and GOJ standards, guidelines and manuals. Also, compliance and conformity with all State government's regulations utilizing innovative techniques and program review.

1.6.1 Topography Study/ Survey

Geotechnical study was conducted at site to assess the volume of waste at dumpsite. The survey was conducted using SOKKIA FX Series (FX-101/102/103/105/107) Functional X-ellence Total Station.

1.6.1.1 The Instrument and Tool

The SOKKIA FX Series (FX-101/102/103/105/107) instrument is manufactured by Topcon Corporation, Japan.

1.6.1.2 Main Features SOKKIA FX Series Total Station

FX series Total Station is a lightweight instrument with Microsoft Windows CE operating system and Magnet field on board application software, Red tech technology Reflectorless EDM. Long lasting battery, advanced angle measurement system, long link data communication, blue tooth wireless technology, waterproof rugged and operator friendly.

3.5 inch TFT transflective TFT QVGA colour LCD screen, 26 key keyboard, optical plummet magnifier 3X, minimum focus 0.3 m, auto power cut, laser plummet single source Red laser dicode 635± 10 nm. Beam accuracy 1.0mm or less, standard operating temperature -20^0 C to 50^0 C, The main features of SOKKIA FX Series: 3R Laser Product (EDM is classified as 3R Laser Product when reflectorless measurement is selected- when the prism or the reflective sheet is selected as target, the output is equivalent to safer class 1).

1.6.1.3 Technology

The Sokkia FX series Total Station has Red tech technology Reflectorless EDM. It offers a tight beam signal and strong returns from the most difficult of surfaces both dark and wet. The instrument has MAGNET Field on board software, a cloud-based application software. All the total station functions are available directly on-board the FX Total Station touch screen with Magnet software to yield higher levels of production. A long-range Bluetooth wireless technology. USB and RS232C for communication with data collectors etc. The FX communication provides control at the remote position when connected with the external data collector. It also supports connection with Cable.

The report is prepared based on the various guidelines, specifications published by CPHEEO, Ministry of Environment, Forest and Climate Change (MoEF&CC) and other relevant manuals, guidelines of Govt. of Uttar Pradesh and respective IS Codes etc. The report is prepared to ensure appraisal, approval, and subsequent project implementation in a timely and efficient manner.

1.7 Structure of the Report

This report has been prepared as a part of detail report preparation for Scientific Dumpsite Land Reclamation through Bio-mining and Resource Recovery at dumpsite at Ghaziabad in Uttar Pradesh. The whole report is described as per the following chapters:

Chapter1: Introduction
Chapter2: City Profile
Chapter3: Solid Waste Management Scenario
Chapter4: Waste Quantification and Characterization at Dumpsite
Chapter5: Selection of Technology
Chapter6 Treatment Process and Proposed Budget
Chapter7: Summary of Cost Estimation for Biomining of Dumpsite
Chapter8: Models for Implementing Dumpsite Remediation
Chapter9: Standard Procedures for Operations
Chapter 10: Annexure – I Management Plans
Chapter 11: Annexure – II Appendix–Environmental Management Plan
Chapter 12: Annexure – III Detailed Estimate of Civil Work
Chapter 13: Annexure – IV Quotations
Chapter 14: Annexure – V Layout Plan & Drawings

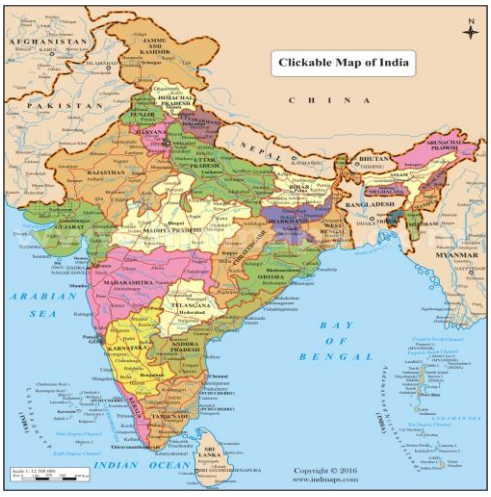
2 City Profile

ULB Population (2011): 2358525
Present Population : NA
Households : 267945 Nos.
No. of Zone : 5 No.
No of Wards : 100 Wards
Door to Door Collection: 100 Wards
Total Waste Generation: 1180 MTD
Plants Operational : No

Ghaziabad is a city in the Indian state of Uttar Pradesh and a part of Delhi NCR. It is the administrative headquarters of Ghaziabad district and is the largest city in western Uttar Pradesh, with a population of 1,729,000. Ghaziabad Municipal Corporation is divided into 5 zones - City Zone, Kavi Nagar Zone, Vijay Nagar Zone, Mohan Nagar Zone and Vasundhara Zone. The Municipal Corporation comprises 100 wards. Well connected by roads and railways, it is a major rail junction for North India.

It is sometimes referred to as the "Saya of Uttar Pradesh" because it is close to New Delhi, on the main route into Uttar Pradesh. Recent construction works have led to the city being described by a City Mayors Foundation survey as the second fastest-growing in the world. Situated in the Upper Gangetic Plains, the city has two major divisions separated by the Hindon River, namely Trans-Hindon on the west and Cis-Hindon on the east..

Ghaziabad Municipal corporation is divided into 5 zones - City Zone, Kavi Nagar Zone, Vijay Nagar Zone, Mohan Nagar Zone and Vasundhara Zone. The Municipal Corporation comprises 100 wards, with councillors elected from each ward. The local elections to all wards was last held in 2017.



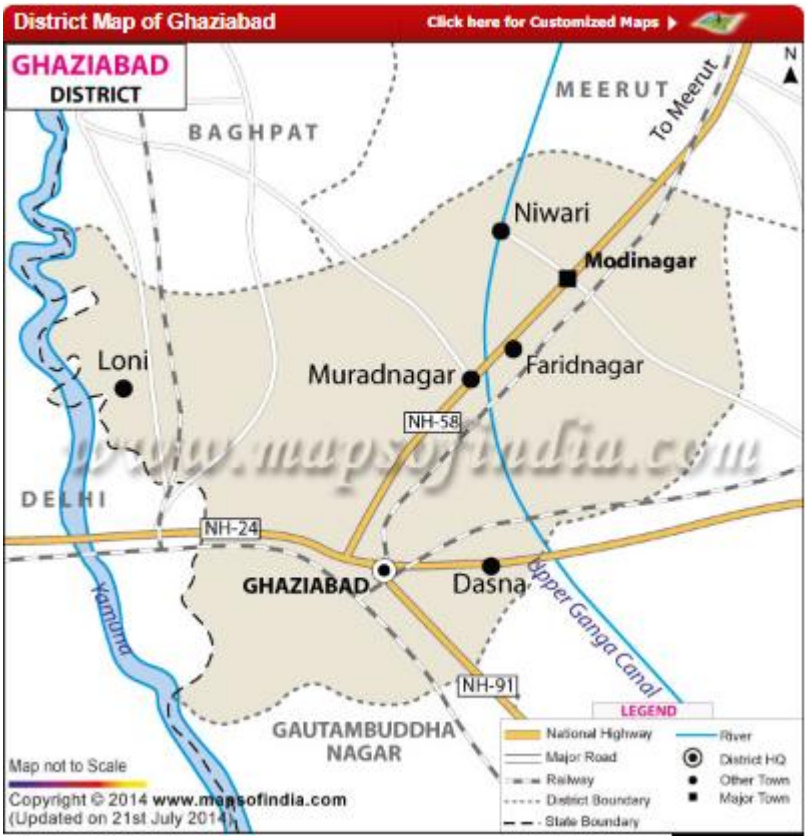


Figure 2-1 Location of Ghaziabad

The city of Ghaziabad was founded in 1740 A.D. by Ghazi-ud-Din, who served as a wazir in the court of Mughal emperor Muhammad Shah, and named it as "Ghaziuddinnagar" after his own name. The name "Ghaziuddinnagar" was shortened to its present form, i.e. "Ghaziabad" with the opening of the Railways in 1864. During the Mughal period, Ghaziabad and especially the banks of the Hindon in Ghaziabad, remained a picnic spot for the Mughal royal family.

Establishment of the Scientific Society here, during the same period is considered as a milestone of the educational movement launched by Syed Ahmad Khan. The Scinde, Punjab & Delhi Railway, connecting Delhi and Lahore, up until Ambala through Ghaziabad was opened in the same year. With the completion of the Amritsar-Saharanpur-Ghaziabad line of the Sind, Punjab and Delhi Railway in 1870, Delhi was connected to Multan through Ghaziabad, and Ghaziabad became the junction of the East Indian Railway and Sind, Punjab and Delhi Railway.

Ghaziabad, along with Meerut and Bulandshahr, remained one of the three Munsifis of the District, under the Meerut Civil Judgeship during most periods of the British Raj.

Ghaziabad was associated with the Indian independence movement from the Indian Rebellion of 1857.

2.1 Population

The provisional data derived from the 2011 census shows that Ghaziabad urban agglomeration had a population of 2,358,525, of which males were 1,256,783 and females were 1,101,742. The literacy rate was 93.81%. Ghaziabad is a subcategory B1 district of category B i.e. having socioeconomic parameters below the national average. It is the second largest industrial city in Uttar Pradesh after Kanpur.

2.2 Topography, Climate and Rainfall

As it is connected to the national capital, its temperature and rainfall are similar to Delhi. Rajasthan's dust storms and snowfall in the Himalayas and Kumaon hills name their impact in the weather regularly. The monsoon arrives in the district at the end of June or the first week of July and normally it rains until October. As in other districts of northern India mainly three seasons - summer, winter and rainy - prevail here, but sometimes due to severe snowfall in the Himalayas and Kumaon Hills, adverse weather can also be seen. Due to a number of construction and highway projects causing cutting down hundreds of old trees rapidly, the pollution and rising temperature issues have increased significantly.

3 Solid Waste Management Scenario

3.1 Waste Profile in Ghaziabad City

Door to Door Primary Collection of waste started by ULB in 100 Wards Vehicles & Equipments Purchased-Primary Collection is being done in single shifts to improve the collection efficiency with available vehicles. Door to door primary collection of waste is in practice, Collection is done by Waste collectors. To get maximum primary collection efficiency, door to door collection is being done in two times from morning 0600 hrs to 1800 hrs. About 1000 MT/day of garbage is being generated in the city.

3.2 Quantification of MSW in Ghaziabad

As information given by the Nagar Nigam, Ghaziabad City officials the quantity of waste generated is 1000 MT/day.

3.3 Present Status of the Ghaziabad Disposal Site

Presently, mixed waste from all over the town, (except the segregated waste collected from the residential areas) is transported and dumped at dumpsite at Bhikanpur, Ghaziabad, Uttar Pradesh..

The solid waste is transported to designated disposal sites identified by Municipal Corporation Ghaziabad. None of the landfill sites is lined and waste is directly dumped (without segregation) into the Ghaziabad dump site. Municipal Corporation, Ghaziabad employs JCBs to spread waste at the disposal sites. Details of disposal sites are given in Table.

Figure 3-1 Ghaziabad Dumpsite

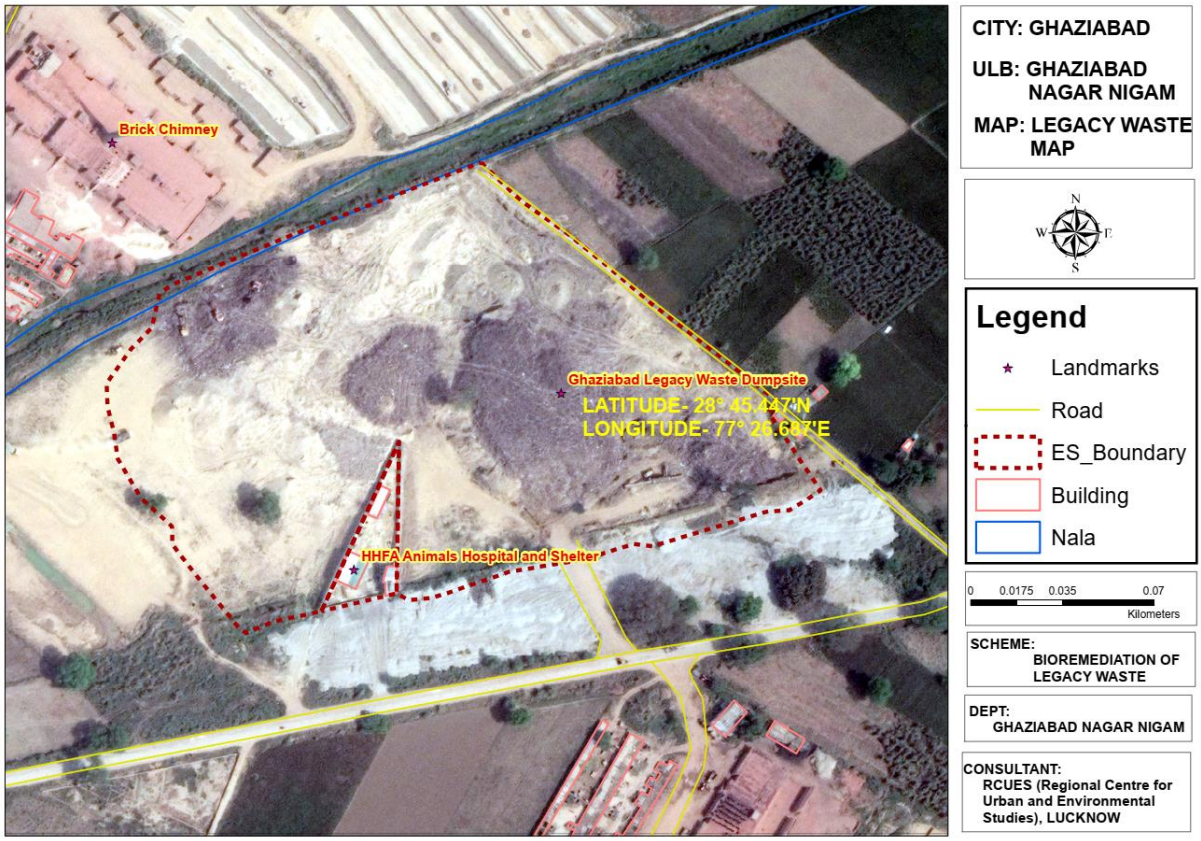


Figure 3-2 Dumpsite Satellite Imagery (from Google Earth)

Table 3-1 Dumpsite Details

S. No.	Description	Details
1.	Dumpsite Name	Dumpsite at Ghaziabad, Uttar Pradesh
2.	Total Area (Acre)	Total area of waste management site:7.25 acre
3.	Dumpsite Site Location Coordinates	Latitude- 28° 45.447'N Longitude- 77° 26.687'E
4.	Total Old Waste (Legacy Waste) at site to be processed for Dumpsite reclamation	329936 Metric Ton
5.	Road Distance from Nagar Nigam Office to the Dumpsite	12 km

4 Waste Quantification and Characterization at Dumpsite

4.1 Preface

The work for the Legacy Solid Waste dumped at dumpsite, Ghaziabad City carried out using Red tech technology Reflector less EDM technique by SOKKIA FX Series Total Station equipped with digital GNSS.

SOKKIA FX Series Total Station and Aerial Imagery survey with auto levelling techniques used for determining the actual volumetric report of legacy waste at Dumpsite. Ghaziabad Municipality Corporation has prepared DPR for Bioremediation and Bio-mining of legacy waste at Dumpsite in Ghaziabad based on volumetric report. Photograph of survey conducted at Ghaziabad dumpsite are given below in **Figure 4.1**.

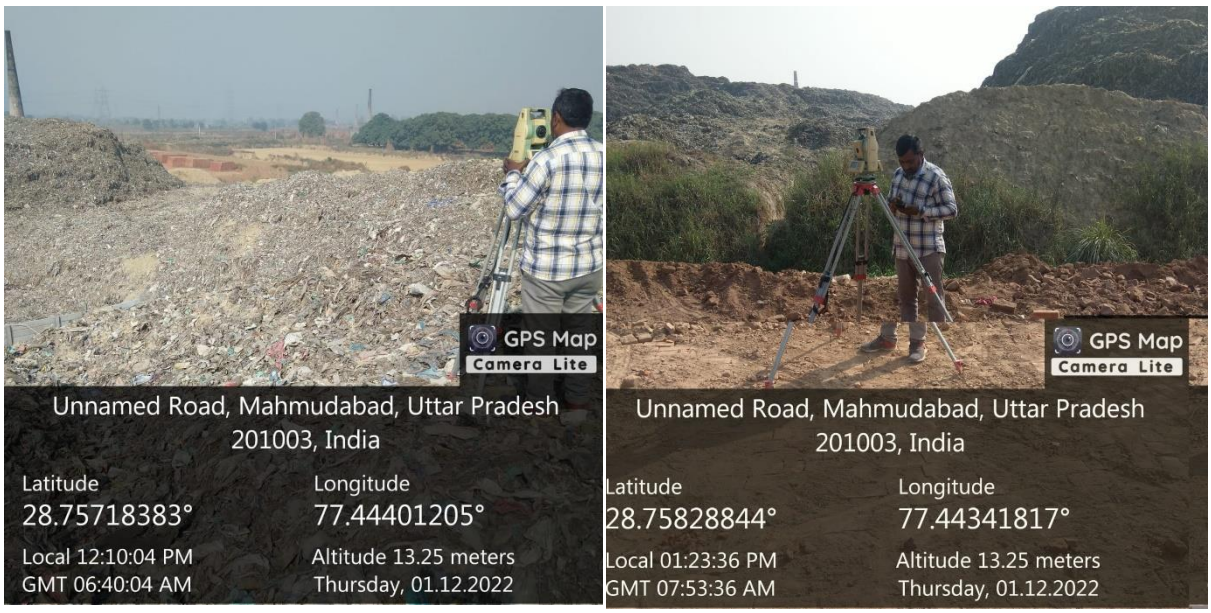


Figure 4-1 Site Survey

The volumetric table mentioning the details is presented below

Table 4-1 List of GCP (ground control points) Volume Calculation

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
1	217.253,218.251,217.239,217.468,217.253	217.493	215.500	5.638	1.993	11.237
2	218.251,219.866,219.114,216.825,217.239,217.239	218.089	215.500	21.264	2.589	55.052
3	219.866,220.444,219.708,219.114,219.114	219.649	215.500	13.139	4.149	54.514
4	220.444,219.608,219.59,219.804,219.708,219.708	219.810	215.500	3.328	4.310	14.344
5	219.608,219.577,219.59,219.59	219.591	215.500	0.003	4.091	0.012
6	216.806,218.667,217.045,216.806	217.331	215.500	2.911	1.831	5.330
7	218.667,219.709,218.251,217.253,217.045,217.045	217.995	215.500	22.798	2.495	56.881
8	219.709,220.258,219.866,218.251	219.521	215.500	25.000	4.021	100.525
9	220.258,220.887,220.444,219.866	220.364	215.500	25.000	4.864	121.600
10	220.887,220.802,219.608,220.444	220.436	215.500	25.000	4.936	123.400
11	220.802,220.93,219.147,219.577,219.577,219.608	219.940	215.500	22.487	4.440	99.842
12	220.93,219.937,217.974,219.147,219.147	219.427	215.500	17.087	3.927	67.101
13	219.937,218.523,217.43,217.974,217.974	218.368	215.500	11.683	2.868	33.507
14	218.523,217.818,217.356,217.43,217.43	217.711	215.500	2.001	2.211	4.424
15	216.359,217.887,216.496,216.359	216.775	215.500	0.958	1.275	1.221
16	217.887,220.854,218.667,216.806,216.496,216.496	217.868	215.500	20.108	2.368	47.616
17	220.854,221.655,219.709,218.667	220.221	215.500	25.000	4.721	118.025
18	221.655,222.039,220.258,219.709	220.915	215.500	25.000	5.415	135.375
19	222.039,223.295,220.887,220.258	221.620	215.500	25.000	6.120	153.000
20	223.295,222.899,220.802,220.887	221.971	215.500	25.000	6.471	161.775
21	222.899,222.718,220.93,220.802	221.838	215.500	25.000	6.338	158.450
22	222.718,221.953,219.937,220.93	221.385	215.500	25.000	5.885	147.125
23	221.953,220.736,218.523,219.937	220.288	215.500	25.000	4.788	119.700
24	220.736,219.245,217.818,217.818,218.523	218.828	215.500	13.541	3.328	45.064
25	217.612,217.622,217.613,217.612	217.615	215.500	0.000	2.115	0.000
26	217.622,218.859,217.942,217.926,217.613,217.613	217.929	215.500	6.841	2.429	16.617
27	218.859,218.675,218.041,217.942,217.942	218.292	215.500	10.259	2.792	28.643
28	218.675,218.347,218.076,218.084,218.041,218.041	218.211	215.500	7.250	2.711	19.655
29	218.347,218.068,218.076,218.076	218.142	215.500	1.249	2.642	3.300

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
30	215.912,216.351,215.947,215.912	216.031	215.500	0.063	0.531	0.033
31	216.351,219.402,217.887,216.359,215.947,215.947	216.982	215.500	16.359	1.482	24.244
32	219.402,221.632,220.854,217.887	219.944	215.500	25.000	4.444	111.100
33	221.632,223.649,221.655,220.854	221.947	215.500	25.000	6.447	161.175
34	223.649,225.561,222.039,221.655	223.226	215.500	25.000	7.726	193.150
35	225.561,226.087,223.295,222.039	224.246	215.500	25.000	8.746	218.650
36	226.087,225.313,222.899,223.295	224.399	215.500	25.000	8.899	222.475
37	225.313,224.427,222.718,222.899	223.840	215.500	25.000	8.340	208.500
38	224.427,222.754,221.953,222.718	222.963	215.500	25.000	7.463	186.575
39	222.754,221.328,220.736,221.953	221.693	215.500	25.000	6.193	154.825
40	221.328,220.748,219.959,219.245,219.245,220.736	220.210	215.500	23.568	4.710	111.005
41	220.748,220.672,219.959,219.959	220.335	215.500	1.433	4.835	6.929
42	219.866,219.913,217.622,217.612,217.602,219.866	218.747	215.500	1.788	3.247	5.806
43	219.913,220.481,218.859,217.622	219.218	215.500	25.000	3.718	92.950
44	220.481,220.512,218.675,218.859	219.631	215.500	25.000	4.131	103.275
45	220.512,220.007,218.347,218.675	219.385	215.500	25.000	3.885	97.125
46	220.007,219.556,218.044,218.065,218.068,218.068,218.347	218.594	215.500	24.399	3.094	75.491
47	219.556,219.257,217.966,217.954,218.044,218.044	218.470	215.500	17.388	2.970	51.642
48	219.257,218.537,218.017,217.966,217.966	218.349	215.500	8.715	2.849	24.829
49	218.537,218.044,218.017,218.017	218.154	215.500	1.143	2.654	3.034
50	217.484,216.351,215.912,215.652	216.350	215.500	7.185	0.850	6.107
51	217.484,220.732,219.402,216.351	218.492	215.500	25.000	2.992	74.800
52	220.732,222.16,221.632,219.402	220.982	215.500	25.000	5.482	137.050
53	222.16,225.227,223.649,221.632	223.167	215.500	25.000	7.667	191.675
54	225.227,228.293,225.561,223.649	225.683	215.500	25.000	10.183	254.575
55	228.293,229.342,226.087,225.561	227.321	215.500	25.000	11.821	295.525
56	229.342,227.849,225.313,226.087	227.148	215.500	25.000	11.648	291.200
57	227.849,226.199,224.427,225.313	225.947	215.500	25.000	10.447	261.175
58	226.199,224.081,222.754,224.427	224.365	215.500	25.000	8.865	221.625
59	224.081,221.532,221.328,222.754	222.424	215.500	25.000	6.924	173.100
60	221.532,221.511,220.748,221.328	221.280	215.500	25.000	5.780	144.500

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
61	221.511,221.618,220.672,220.672,220.748	221.044	215.500	11.461	5.544	63.540
62	220.898,220.874,219.913,219.866,220.898	220.490	215.500	1.431	4.990	7.141
63	220.874,221.788,220.481,219.913	220.764	215.500	25.000	5.264	131.600
64	221.788,223.271,220.512,220.481	221.513	215.500	25.000	6.013	150.325
65	223.271,222.21,220.007,220.512	221.500	215.500	25.000	6.000	150.000
66	222.21,222.022,219.556,220.007	220.949	215.500	25.000	5.449	136.225
67	222.022,221.639,219.257,219.556	220.619	215.500	25.000	5.119	127.975
68	221.639,221.086,218.537,219.257	220.130	215.500	25.000	4.630	115.750
69	221.086,220.547,218.069,218.044,218.044,218.537	219.055	215.500	23.997	3.555	85.309
70	220.547,219.656,218.12,218.069,218.069	218.892	215.500	16.564	3.392	56.185
71	219.656,219.224,218.349,218.145,218.12,218.12	218.603	215.500	8.571	3.103	26.596
72	219.224,219.065,218.742,218.349,218.349	218.746	215.500	3.825	3.246	12.416
73	219.065,218.9,218.742,218.742	218.862	215.500	0.342	3.362	1.150
74	217.462,218.675,217.484	217.874	215.500	12.500	2.374	29.675
75	218.675,221.13,220.732,217.484	219.505	215.500	25.000	4.005	100.125
76	221.13,223.852,222.16,220.732	221.969	215.500	25.000	6.469	161.725
77	223.852,226.306,225.227,222.16	224.386	215.500	25.000	8.886	222.150
78	226.306,228.744,228.293,225.227	227.142	215.500	25.000	11.642	291.050
79	228.744,230.669,229.342,228.293	229.262	215.500	25.000	13.762	344.050
80	230.669,228.861,227.849,229.342	229.180	215.500	25.000	13.680	342.000
81	228.861,227.053,226.199,227.849	227.491	215.500	25.000	11.991	299.775
82	227.053,225.5,224.081,226.199	225.708	215.500	25.000	10.208	255.200
83	225.5,223.189,221.532,224.081	223.575	215.500	25.000	8.075	201.875
84	223.189,221.838,221.511,221.532	222.017	215.500	25.000	6.517	162.925
85	221.838,222.444,222.132,221.618,221.618,221.511	221.860	215.500	22.339	6.360	142.076
86	222.444,222.372,222.132,222.132	222.270	215.500	0.581	6.770	3.933
87	220.98,220.963,220.874,220.898,220.98	220.939	215.500	1.038	5.439	5.646
88	220.963,222.495,221.788,220.874	221.530	215.500	25.000	6.030	150.750
89	222.495,225.729,223.271,221.788	223.321	215.500	25.000	7.821	195.525
90	225.729,225.75,222.21,223.271	224.240	215.500	25.000	8.740	218.500
91	225.75,225.17,222.022,222.21	223.788	215.500	25.000	8.288	207.200

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
92	225.17,225.684,221.639,222.022	223.629	215.500	25.000	8.129	203.225
93	225.684,223.967,221.086,221.639	223.094	215.500	25.000	7.594	189.850
94	223.967,223.869,220.547,221.086	222.367	215.500	25.000	6.867	171.675
95	223.869,223.448,219.656,220.547	221.880	215.500	25.000	6.380	159.500
96	223.448,223.059,219.224,219.656	221.347	215.500	25.000	5.847	146.175
97	223.059,222.712,219.065,219.224	221.015	215.500	25.000	5.515	137.875
98	222.712,222.873,219.135,218.9,218.9,219.065	220.264	215.500	24.240	4.764	115.479
99	222.873,223.446,219.528,219.135,219.135	220.824	215.500	20.338	5.324	108.280
100	223.446,221.12,219.609,219.528,219.528	220.646	215.500	16.095	5.146	82.825
101	221.12,219.718,219.43,219.609,219.609	219.897	215.500	11.852	4.397	52.113
102	219.718,219.348,219.292,219.369,219.43,219.43	219.431	215.500	6.837	3.931	26.876
103	219.348,219.245,219.292,219.292	219.294	215.500	0.635	3.794	2.409
104	216.057,217.788,217.462	217.103	215.500	12.500	1.603	20.038
105	217.788,219.098,218.675,217.462	218.256	215.500	25.000	2.756	68.900
106	219.098,221.768,221.13,218.675	220.168	215.500	25.000	4.668	116.700
107	221.768,224.499,223.852,221.13	222.812	215.500	25.000	7.312	182.800
108	224.499,228.46,226.306,223.852	225.779	215.500	25.000	10.279	256.975
109	228.46,230.891,228.744,226.306	228.600	215.500	25.000	13.100	327.500
110	230.891,231.298,230.669,228.744	230.400	215.500	25.000	14.900	372.500
111	231.298,229.598,228.861,230.669	230.106	215.500	25.000	14.606	365.150
112	229.598,227.897,227.053,228.861	228.352	215.500	25.000	12.852	321.300
113	227.897,226.336,225.5,227.053	226.697	215.500	25.000	11.197	279.925
114	226.336,224.912,223.189,225.5	224.984	215.500	25.000	9.484	237.100
115	224.912,221.948,221.838,223.189	222.972	215.500	25.000	7.472	186.800
116	221.948,221.6,222.444,221.838	221.958	215.500	25.000	6.458	161.450
117	221.6,221.848,222.372,222.372,222.444	222.127	215.500	9.381	6.627	62.168
118	222.901,222.941,220.963,220.98,222.901	222.137	215.500	0.645	6.637	4.281
119	222.941,223.806,222.495,220.963	222.551	215.500	25.000	7.051	176.275
120	223.806,226.51,225.729,222.495	224.635	215.500	25.000	9.135	228.375
121	226.51,226.034,225.75,225.729	226.006	215.500	25.000	10.506	262.650
122	226.034,226.837,225.17,225.75	225.948	215.500	25.000	10.448	261.200

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
123	226.837,226.676,225.684,225.17	226.092	215.500	25.000	10.592	264.800
124	226.676,227.367,223.967,225.684	225.923	215.500	25.000	10.423	260.575
125	227.367,227.219,223.869,223.967	225.605	215.500	25.000	10.105	252.625
126	227.219,226.969,223.448,223.869	225.376	215.500	25.000	9.876	246.900
127	226.969,227.618,223.059,223.448	225.273	215.500	25.000	9.773	244.325
128	227.618,227.505,222.712,223.059	225.224	215.500	25.000	9.724	243.100
129	227.505,226.656,222.873,222.712	224.937	215.500	25.000	9.437	235.925
130	226.656,226.53,223.446,222.873	224.876	215.500	25.000	9.376	234.400
131	226.53,227.391,221.12,223.446	224.622	215.500	25.000	9.122	228.050
132	227.391,224.887,219.718,221.12	223.279	215.500	25.000	7.779	194.475
133	224.887,221.986,219.348,219.718	221.484	215.500	25.000	5.984	149.600
134	221.986,223.307,219.625,219.245,219.245,219.348	220.459	215.500	23.614	4.959	117.102
135	223.307,224.573,218.872,219.625,219.625	221.200	215.500	16.454	5.700	93.788
136	224.573,219.295,218.12,218.872,218.872	219.946	215.500	8.660	4.446	38.502
137	219.295,220.22,218.051,218.087,218.12,218.12	218.649	215.500	5.896	3.149	18.567
138	220.22,219.888,218.953,218.033,218.051,218.051	218.866	215.500	7.523	3.366	25.322
139	219.888,220.058,218.953,218.953	219.463	215.500	1.581	3.963	6.266
140	215.573,216.211,216.057	215.947	215.500	3.131	0.447	1.400
141	216.211,218.78,217.788,216.057	217.209	215.500	25.000	1.709	42.725
142	218.78,219.603,219.098,217.788	218.817	215.500	25.000	3.317	82.925
143	219.603,221.598,221.768,219.098	220.517	215.500	25.000	5.017	125.425
144	221.598,224.083,224.499,221.768	222.987	215.500	25.000	7.487	187.175
145	224.083,229.16,228.46,224.499	226.551	215.500	25.000	11.051	276.275
146	229.16,230.797,230.891,228.46	229.827	215.500	25.000	14.327	358.175
147	230.797,231.653,231.298,230.891	231.160	215.500	25.000	15.660	391.500
148	231.653,230.112,229.598,231.298	230.665	215.500	25.000	15.165	379.125
149	230.112,228.333,227.897,229.598	228.985	215.500	25.000	13.485	337.125
150	228.333,226.315,226.336,227.897	227.220	215.500	25.000	11.720	293.000
151	226.315,224.462,224.912,226.336	225.506	215.500	25.000	10.006	250.150
152	224.462,222.317,221.948,224.912	223.410	215.500	25.000	7.910	197.750
153	222.317,220.125,221.6,221.948	221.498	215.500	25.000	5.998	149.950

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
154	220.125,219.949,220.177,221.848,221.848,221.6	220.925	215.500	20.733	5.425	112.477
155	219.949,220.088,220.177,220.177	220.098	215.500	0.108	4.598	0.497
156	224.759,224.762,222.941,222.901,224.759	224.024	215.500	0.252	8.524	2.148
157	224.762,225.697,223.806,222.941	224.301	215.500	25.000	8.801	220.025
158	225.697,225.804,226.51,223.806	225.454	215.500	25.000	9.954	248.850
159	225.804,226.049,226.034,226.51	226.099	215.500	25.000	10.599	264.975
160	226.049,227.283,226.837,226.034	226.550	215.500	25.000	11.050	276.250
161	227.283,228.147,226.676,226.837	227.235	215.500	25.000	11.735	293.375
162	228.147,229.027,227.367,226.676	227.804	215.500	25.000	12.304	307.600
163	229.027,229.204,227.219,227.367	228.204	215.500	25.000	12.704	317.600
164	229.204,228.756,226.969,227.219	228.037	215.500	25.000	12.537	313.425
165	228.756,229.143,227.618,226.969	228.121	215.500	25.000	12.621	315.525
166	229.143,230.4,227.505,227.618	228.667	215.500	25.000	13.167	329.175
167	230.4,228.816,226.656,227.505	228.344	215.500	25.000	12.844	321.100
168	228.816,227.692,226.53,226.656	227.423	215.500	25.000	11.923	298.075
169	227.692,228.107,227.391,226.53	227.430	215.500	25.000	11.930	298.250
170	228.107,227.355,224.887,227.391	226.935	215.500	25.000	11.435	285.875
171	227.355,224.634,221.986,224.887	224.715	215.500	25.000	9.215	230.375
172	224.634,225.84,223.307,221.986	223.942	215.500	25.000	8.442	211.050
173	225.84,227.046,224.573,223.307	225.191	215.500	25.000	9.691	242.275
174	227.046,226.368,219.295,224.573	224.320	215.500	25.000	8.820	220.500
175	226.368,227.172,220.22,219.295	223.264	215.500	25.000	7.764	194.100
176	227.172,226.148,219.888,220.22	223.357	215.500	25.000	7.857	196.425
177	226.148,225.33,220.661,220.058,220.058,219.888	222.024	215.500	24.529	6.524	160.027
178	225.33,224.373,222.169,220.661,220.661	222.639	215.500	18.552	7.139	132.443
179	224.373,223.297,222.227,222.169,222.169	222.847	215.500	10.994	7.347	80.773
180	223.297,222.283,222.227,222.227	222.509	215.500	3.445	7.009	24.146
181	215.489,215.784,215.488,215.489	215.562	215.500	0.352	0.062	0.022
182	215.784,218.453,216.211,215.573,215.487,215.488,215.488	216.069	215.500	15.779	0.569	8.978
183	218.453,219.496,218.78,216.211	218.235	215.500	25.000	2.735	68.375
184	219.496,220.17,219.603,218.78	219.512	215.500	25.000	4.012	100.300

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
185	220.17,221.501,221.598,219.603	220.718	215.500	25.000	5.218	130.450
186	221.501,223.965,224.083,221.598	222.787	215.500	25.000	7.287	182.175
187	223.965,226.2,229.16,224.083	225.852	215.500	25.000	10.352	258.800
188	226.2,229.557,230.797,229.16	228.929	215.500	25.000	13.429	335.725
189	229.557,231.317,231.653,230.797	230.831	215.500	25.000	15.331	383.275
190	231.317,230.309,230.112,231.653	230.848	215.500	25.000	15.348	383.700
191	230.309,228.617,228.333,230.112	229.343	215.500	25.000	13.843	346.075
192	228.617,227.127,226.315,228.333	227.598	215.500	25.000	12.098	302.450
193	227.127,225.649,224.462,226.315	225.888	215.500	25.000	10.388	259.700
194	225.649,223.417,222.317,224.462	223.961	215.500	25.000	8.461	211.525
195	223.417,220.575,220.125,222.317	221.609	215.500	25.000	6.109	152.725
196	220.575,220.441,219.949,220.125	220.273	215.500	25.000	4.773	119.325
197	220.441,221.028,220.088,220.088,219.949	220.319	215.500	7.300	4.819	35.179
198	224.731,224.762,224.759,224.731	224.746	215.500	0.004	9.246	0.037
199	224.63,225.333,225.697,224.762,224.731,224.63	224.964	215.500	24.855	9.464	235.228
200	225.333,225.515,225.804,225.697	225.587	215.500	25.000	10.087	252.175
201	225.515,226.528,226.049,225.804	225.974	215.500	25.000	10.474	261.850
202	226.528,227.646,227.283,226.049	226.877	215.500	25.000	11.377	284.425
203	227.646,228.489,228.147,227.283	227.891	215.500	25.000	12.391	309.775
204	228.489,229.571,229.027,228.147	228.808	215.500	25.000	13.308	332.700
205	229.571,229.024,229.204,229.027	229.207	215.500	25.000	13.707	342.675
206	229.024,228.66,228.756,229.204	228.911	215.500	25.000	13.411	335.275
207	228.66,228.851,229.143,228.756	228.852	215.500	25.000	13.352	333.800
208	228.851,229.548,230.4,229.143	229.486	215.500	25.000	13.986	349.650
209	229.548,228.662,228.816,230.4	229.356	215.500	25.000	13.856	346.400
210	228.662,229.184,227.692,228.816	228.588	215.500	25.000	13.088	327.200
211	229.184,229.469,228.107,227.692	228.613	215.500	25.000	13.113	327.825
212	229.469,229.021,227.355,228.107	228.488	215.500	25.000	12.988	324.700
213	229.021,227.324,224.634,227.355	227.083	215.500	25.000	11.583	289.575
214	227.324,227.568,225.84,224.634	226.341	215.500	25.000	10.841	271.025
215	227.568,228.388,227.046,225.84	227.210	215.500	25.000	11.710	292.750

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
216	228.388,228.315,226.368,227.046	227.529	215.500	25.000	12.029	300.725
217	228.315,227.886,227.172,226.368	227.435	215.500	25.000	11.935	298.375
218	227.886,224.785,226.148,227.172	226.498	215.500	25.000	10.998	274.950
219	224.785,222.708,225.33,226.148	224.743	215.500	25.000	9.243	231.075
220	222.708,223.688,224.373,225.33	224.025	215.500	25.000	8.525	213.125
221	223.688,226.084,223.297,224.373	224.361	215.500	25.000	8.861	221.525
222	226.084,225.453,222.286,222.283,222.283,223.297	223.614	215.500	24.992	8.114	202.785
223	225.453,224.822,222.353,222.286,222.286	223.440	215.500	20.879	7.940	165.779
224	224.822,223.336,222.42,222.353,222.353	223.057	215.500	13.322	7.557	100.674
225	223.336,221.027,221.125,222.42,222.42	222.066	215.500	5.764	6.566	37.846
226	221.027,220.42,221.125,221.125	220.924	215.500	0.261	5.424	1.416
227	215.49,215.925,215.49,215.49	215.599	215.500	0.762	0.099	0.075
228	215.925,217.953,215.784,215.489,215.49,215.49	216.022	215.500	17.132	0.522	8.943
229	217.953,221.023,218.453,215.784	218.303	215.500	25.000	2.803	70.075
230	221.023,221.946,219.496,218.453	220.229	215.500	25.000	4.729	118.225
231	221.946,221.779,220.17,219.496	220.848	215.500	25.000	5.348	133.700
232	221.779,223.031,221.501,220.17	221.620	215.500	25.000	6.120	153.000
233	223.031,228.259,223.965,221.501	224.189	215.500	25.000	8.689	217.225
234	228.259,229.093,226.2,223.965	226.879	215.500	25.000	11.379	284.475
235	229.093,230.738,229.557,226.2	228.897	215.500	25.000	13.397	334.925
236	230.738,230.905,231.317,229.557	230.629	215.500	25.000	15.129	378.225
237	230.905,230.905,230.309,231.317	230.859	215.500	25.000	15.359	383.975
238	230.905,230.117,228.617,230.309	229.987	215.500	25.000	14.487	362.175
239	230.117,229.197,227.127,228.617	228.765	215.500	25.000	13.265	331.625
240	229.197,226.262,225.649,227.127	227.059	215.500	25.000	11.559	288.975
241	226.262,223.92,223.417,225.649	224.812	215.500	25.000	9.312	232.800
242	223.92,223.663,220.575,223.417	222.894	215.500	25.000	7.394	184.850
243	223.663,222.11,220.441,220.575	221.697	215.500	25.000	6.197	154.925
244	222.11,221.384,221.028,221.028,220.441	221.198	215.500	18.760	5.698	106.894
245	224.653,226.051,225.333,224.63,224.653	225.064	215.500	24.466	9.564	233.993
246	226.051,226.739,225.515,225.333	225.909	215.500	25.000	10.409	260.225

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
247	226.739,226.61,226.528,225.515	226.348	215.500	25.000	10.848	271.200
248	226.61,227.631,227.646,226.528	227.104	215.500	25.000	11.604	290.100
249	227.631,228.057,228.489,227.646	227.956	215.500	25.000	12.456	311.400
250	228.057,228.225,229.571,228.489	228.585	215.500	25.000	13.085	327.125
251	228.225,228.191,229.024,229.571	228.753	215.500	25.000	13.253	331.325
252	228.191,228.112,228.66,229.024	228.497	215.500	25.000	12.997	324.925
253	228.112,228.126,228.851,228.66	228.437	215.500	25.000	12.937	323.425
254	228.126,228.04,229.548,228.851	228.641	215.500	25.000	13.141	328.525
255	228.04,229.873,228.662,229.548	229.030	215.500	25.000	13.530	338.250
256	229.873,229.485,229.184,228.662	229.301	215.500	25.000	13.801	345.025
257	229.485,225.33,229.469,229.184	228.367	215.500	25.000	12.867	321.675
258	225.33,230.844,229.021,229.469	228.666	215.500	25.000	13.166	329.150
259	230.844,229.09,227.324,229.021	229.070	215.500	25.000	13.570	339.250
260	229.09,226.899,227.568,227.324	227.720	215.500	25.000	12.220	305.500
261	226.899,226.377,228.388,227.568	227.308	215.500	25.000	11.808	295.200
262	226.377,226.259,228.315,228.388	227.335	215.500	25.000	11.835	295.875
263	226.259,227.604,227.886,228.315	227.516	215.500	25.000	12.016	300.400
264	227.604,225.58,224.785,227.886	226.464	215.500	25.000	10.964	274.100
265	225.58,223.772,222.708,224.785	224.211	215.500	25.000	8.711	217.775
266	223.772,225.509,223.688,222.708	223.919	215.500	25.000	8.419	210.475
267	225.509,228.218,226.084,223.688	225.875	215.500	25.000	10.375	259.375
268	228.218,227.773,225.453,226.084	226.882	215.500	25.000	11.382	284.550
269	227.773,225.932,224.822,225.453	225.995	215.500	25.000	10.495	262.375
270	225.932,223.872,223.336,224.822	224.490	215.500	25.000	8.990	224.750
271	223.872,221.848,221.027,223.336	222.521	215.500	25.000	7.021	175.525
272	221.848,219.989,218.44,220.42,220.42,221.027	220.357	215.500	22.946	4.857	111.449
273	219.989,221.812,217.873,217.868,218.44,218.44	219.070	215.500	17.489	3.570	62.436
274	221.812,221.366,217.884,217.88,217.873,217.873	219.115	215.500	15.712	3.615	56.799
275	221.366,217.941,217.884,217.884	218.768	215.500	6.624	3.268	21.647
276	215.435,215.482,215.438,215.435	215.448	215.500	0.011	-0.052	-0.001

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
277	215.482,217.612,215.925,215.49,215.491,215.438,215.438	215.840	215.500	17.373	0.340	5.907
278	217.612,219.936,217.953,215.925	217.856	215.500	25.000	2.356	58.900
279	219.936,222.314,221.023,217.953	220.306	215.500	25.000	4.806	120.150
280	222.314,223.414,221.946,221.023	222.174	215.500	25.000	6.674	166.850
281	223.414,224.157,221.779,221.946	222.824	215.500	25.000	7.324	183.100
282	224.157,224.706,223.031,221.779	223.418	215.500	25.000	7.918	197.950
283	224.706,226.716,228.259,223.031	225.678	215.500	25.000	10.178	254.450
284	226.716,227.751,229.093,228.259	227.955	215.500	25.000	12.455	311.375
285	227.751,230.322,230.738,229.093	229.476	215.500	25.000	13.976	349.400
286	230.322,231.138,230.905,230.738	230.776	215.500	25.000	15.276	381.900
287	231.138,230.492,230.905,230.905	230.860	215.500	25.000	15.360	384.000
288	230.492,229.994,230.117,230.905	230.377	215.500	25.000	14.877	371.925
289	229.994,228.161,229.197,230.117	229.367	215.500	25.000	13.867	346.675
290	228.161,226.401,226.262,229.197	227.505	215.500	25.000	12.005	300.125
291	226.401,224.773,223.92,226.262	225.339	215.500	25.000	9.839	245.975
292	224.773,223.148,223.663,223.92	223.876	215.500	25.000	8.376	209.400
293	223.148,220.627,222.11,223.663	222.387	215.500	25.000	6.887	172.175
294	220.627,219.64,221.313,221.384,221.384,222.11	221.076	215.500	24.989	5.576	139.339
295	219.64,219.772,221.313,221.313	220.509	215.500	5.232	5.009	26.207
296	224.162,225.887,226.051,224.653,224.162	224.983	215.500	24.073	9.483	228.284
297	225.887,226.508,226.739,226.051	226.296	215.500	25.000	10.796	269.900
298	226.508,226.302,226.61,226.739	226.540	215.500	25.000	11.040	276.000
299	226.302,227.282,227.631,226.61	226.957	215.500	25.000	11.457	286.425
300	227.282,227.699,228.057,227.631	227.668	215.500	25.000	12.168	304.200
301	227.699,228.603,228.225,228.057	228.146	215.500	25.000	12.646	316.150
302	228.603,228.47,228.191,228.225	228.372	215.500	25.000	12.872	321.800
303	228.47,228.953,228.112,228.191	228.431	215.500	25.000	12.931	323.275
304	228.953,227.556,228.126,228.112	228.187	215.500	25.000	12.687	317.175
305	227.556,229.645,228.04,228.126	228.342	215.500	25.000	12.842	321.050
306	229.645,230.968,229.873,228.04	229.631	215.500	25.000	14.131	353.275

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
307	230.968,227.605,229.485,229.873	229.483	215.500	25.000	13.983	349.575
308	227.605,227.52,225.33,229.485	227.485	215.500	25.000	11.985	299.625
309	227.52,232.013,230.844,225.33	228.927	215.500	25.000	13.427	335.675
310	232.013,231.507,229.09,230.844	230.864	215.500	25.000	15.364	384.100
311	231.507,226.879,226.899,229.09	228.594	215.500	25.000	13.094	327.350
312	226.879,222.991,226.377,226.899	225.786	215.500	25.000	10.286	257.150
313	222.991,224.188,226.259,226.377	224.954	215.500	25.000	9.454	236.350
314	224.188,225.781,227.604,226.259	225.958	215.500	25.000	10.458	261.450
315	225.781,227.314,225.58,227.604	226.570	215.500	25.000	11.070	276.750
316	227.314,227.067,223.772,225.58	225.933	215.500	25.000	10.433	260.825
317	227.067,226.819,225.509,223.772	225.792	215.500	25.000	10.292	257.300
318	226.819,229.569,228.218,225.509	227.529	215.500	25.000	12.029	300.725
319	229.569,228.004,227.773,228.218	228.391	215.500	25.000	12.891	322.275
320	228.004,226.44,225.932,227.773	227.037	215.500	25.000	11.537	288.425
321	226.44,225.027,223.872,225.932	225.318	215.500	25.000	9.818	245.450
322	225.027,223.844,221.848,223.872	223.648	215.500	25.000	8.148	203.700
323	223.844,222.917,219.989,221.848	222.150	215.500	25.000	6.650	166.250
324	222.917,221.902,221.812,219.989	221.655	215.500	25.000	6.155	153.875
325	221.902,220.223,221.366,221.812	221.326	215.500	25.000	5.826	145.650
326	220.223,220.184,217.944,217.941,217.941,221.366	219.266	215.500	24.970	3.766	94.037
327	220.184,219.269,218.028,217.967,217.944,217.944	218.556	215.500	16.165	3.056	49.400
328	219.269,218.152,218.152,218.028,218.028	218.326	215.500	1.636	2.826	4.623
329	215.349,216.409,215.482,215.435,215.349	215.605	215.500	7.995	0.105	0.839
330	216.409,218.899,217.612,215.482	217.100	215.500	25.000	1.600	40.000
331	218.899,221.207,219.936,217.612	219.414	215.500	25.000	3.914	97.850
332	221.207,222.808,222.314,219.936	221.566	215.500	25.000	6.066	151.650
333	222.808,224.198,223.414,222.314	223.183	215.500	25.000	7.683	192.075
334	224.198,224.914,224.157,223.414	224.171	215.500	25.000	8.671	216.775
335	224.914,226.47,224.706,224.157	225.062	215.500	25.000	9.562	239.050
336	226.47,228.402,226.716,224.706	226.573	215.500	25.000	11.073	276.825
337	228.402,229.223,227.751,226.716	228.023	215.500	25.000	12.523	313.075

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
338	229.223,229.75,230.322,227.751	229.262	215.500	25.000	13.762	344.050
339	229.75,230.327,231.138,230.322	230.385	215.500	25.000	14.885	372.125
340	230.327,230.08,230.492,231.138	230.509	215.500	25.000	15.009	375.225
341	230.08,229.412,229.994,230.492	229.994	215.500	25.000	14.494	362.350
342	229.412,228.103,228.161,229.994	228.918	215.500	25.000	13.418	335.450
343	228.103,227.008,226.401,228.161	227.418	215.500	25.000	11.918	297.950
344	227.008,225.497,224.773,226.401	225.920	215.500	25.000	10.420	260.500
345	225.497,223.491,223.148,224.773	224.227	215.500	25.000	8.727	218.175
346	223.491,224.59,220.627,223.148	222.964	215.500	25.000	7.464	186.600
347	224.59,222.92,219.64,220.627	221.944	215.500	25.000	6.444	161.100
348	222.92,221.915,219.772,219.772,219.64	220.804	215.500	16.680	5.304	88.471
349	224.042,225.682,225.887,224.162,224.042	224.763	215.500	23.680	9.263	219.348
350	225.682,226.797,226.508,225.887	226.219	215.500	25.000	10.719	267.975
351	226.797,226.921,226.302,226.508	226.632	215.500	25.000	11.132	278.300
352	226.921,227.725,227.282,226.302	227.058	215.500	25.000	11.558	288.950
353	227.725,228.485,227.699,227.282	227.798	215.500	25.000	12.298	307.450
354	228.485,229.029,228.603,227.699	228.454	215.500	25.000	12.954	323.850
355	229.029,228.439,228.47,228.603	228.635	215.500	25.000	13.135	328.375
356	228.439,229.205,228.953,228.47	228.767	215.500	25.000	13.267	331.675
357	229.205,227.638,227.556,228.953	228.338	215.500	25.000	12.838	320.950
358	227.638,230.727,229.645,227.556	228.891	215.500	25.000	13.391	334.775
359	230.727,231.467,230.968,229.645	230.702	215.500	25.000	15.202	380.050
360	231.467,231.791,227.605,230.968	230.458	215.500	25.000	14.958	373.950
361	231.791,232.305,227.52,227.605	229.805	215.500	25.000	14.305	357.625
362	232.305,232.363,232.013,227.52	231.050	215.500	25.000	15.550	388.750
363	232.363,232.223,231.507,232.013	232.026	215.500	25.000	16.526	413.150
364	232.223,231.679,226.879,231.507	230.572	215.500	25.000	15.072	376.800
365	231.679,231.117,222.991,226.879	228.166	215.500	25.000	12.666	316.650
366	231.117,229.988,224.188,222.991	227.071	215.500	25.000	11.571	289.275
367	229.988,228.858,225.781,224.188	227.204	215.500	25.000	11.704	292.600
368	228.858,227.963,227.314,225.781	227.479	215.500	25.000	11.979	299.475

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
369	227.963,228.686,227.067,227.314	227.757	215.500	25.000	12.257	306.425
370	228.686,229.409,226.819,227.067	227.995	215.500	25.000	12.495	312.375
371	229.409,229.33,229.569,226.819	228.782	215.500	25.000	13.282	332.050
372	229.33,227.849,228.004,229.569	228.688	215.500	25.000	13.188	329.700
373	227.849,226.368,226.44,228.004	227.165	215.500	25.000	11.665	291.625
374	226.368,225.114,225.027,226.44	225.737	215.500	25.000	10.237	255.925
375	225.114,224.176,223.844,225.027	224.540	215.500	25.000	9.040	226.000
376	224.176,223.139,222.917,223.844	223.519	215.500	25.000	8.019	200.475
377	223.139,222.083,221.902,222.917	222.510	215.500	25.000	7.010	175.250
378	222.083,222.403,220.223,221.902	221.653	215.500	25.000	6.153	153.825
379	222.403,222.213,220.184,220.223	221.256	215.500	25.000	5.756	143.900
380	222.213,219.12,218.555,218.555,219.269,220.184	219.649	215.500	22.128	4.149	91.809
381	218.152,219.269,218.555,218.152	218.532	215.500	1.454	3.032	4.409
382	215.262,215.584,215.293,215.262	215.350	215.500	0.939	-0.150	-0.141
383	215.584,217.09,216.409,215.349,215.293,215.293	215.836	215.500	21.914	0.336	7.363
384	217.09,219.581,218.899,216.409	217.995	215.500	25.000	2.495	62.375
385	219.581,221.881,221.207,218.899	220.392	215.500	25.000	4.892	122.300
386	221.881,223.445,222.808,221.207	222.335	215.500	25.000	6.835	170.875
387	223.445,224.903,224.198,222.808	223.839	215.500	25.000	8.339	208.475
388	224.903,225.62,224.914,224.198	224.909	215.500	25.000	9.409	235.225
389	225.62,228.256,226.47,224.914	226.315	215.500	25.000	10.815	270.375
390	228.256,231.035,228.402,226.47	228.540	215.500	25.000	13.040	326.000
391	231.035,230.573,229.223,228.402	229.808	215.500	25.000	14.308	357.700
392	230.573,230.048,229.75,229.223	229.899	215.500	25.000	14.399	359.975
393	230.048,229.609,230.327,229.75	229.934	215.500	25.000	14.434	360.850
394	229.609,229.213,230.08,230.327	229.807	215.500	25.000	14.307	357.675
395	229.213,228.594,229.412,230.08	229.325	215.500	25.000	13.825	345.625
396	228.594,228.061,228.103,229.412	228.543	215.500	25.000	13.043	326.075
397	228.061,227.611,227.008,228.103	227.696	215.500	25.000	12.196	304.900
398	227.611,226.535,225.497,227.008	226.663	215.500	25.000	11.163	279.075
399	226.535,225.598,223.491,225.497	225.280	215.500	25.000	9.780	244.500

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
400	225.598,225.795,224.59,223.491	224.868	215.500	25.000	9.368	234.200
401	225.795,224.251,222.92,224.59	224.389	215.500	25.000	8.889	222.225
402	224.251,222.234,221.928,221.915,221.915,222.92	222.527	215.500	24.707	7.027	173.616
403	222.234,222.754,221.928,221.928	222.211	215.500	3.433	6.711	23.039
404	224.412,225.904,225.682,224.042,224.412	224.890	215.500	23.287	9.390	218.665
405	225.904,227.27,226.797,225.682	226.414	215.500	25.000	10.914	272.850
406	227.27,225.5,226.921,226.797	226.622	215.500	25.000	11.122	278.050
407	225.5,228.001,227.725,226.921	227.037	215.500	25.000	11.537	288.425
408	228.001,228.925,228.485,227.725	228.284	215.500	25.000	12.784	319.600
409	228.925,227.424,229.029,228.485	228.466	215.500	25.000	12.966	324.150
410	227.424,227.051,228.439,229.029	227.986	215.500	25.000	12.486	312.150
411	227.051,228.397,229.205,228.439	228.273	215.500	25.000	12.773	319.325
412	228.397,252.079,227.638,229.205	234.330	215.500	25.000	18.830	470.750
413	252.079,254.464,230.727,227.638	241.227	215.500	25.000	25.727	643.175
414	254.464,241.292,231.467,230.727	239.487	215.500	25.000	23.987	599.675
415	241.292,232.275,231.791,231.467	234.206	215.500	25.000	18.706	467.650
416	232.275,232.282,232.305,231.791	232.163	215.500	25.000	16.663	416.575
417	232.282,232.177,232.363,232.305	232.282	215.500	25.000	16.782	419.550
418	232.177,231.924,232.223,232.363	232.171	215.500	25.000	16.671	416.775
419	231.924,231.251,231.679,232.223	231.769	215.500	25.000	16.269	406.725
420	231.251,230.579,231.117,231.679	231.156	215.500	25.000	15.656	391.400
421	230.579,229.769,229.988,231.117	230.363	215.500	25.000	14.863	371.575
422	229.769,228.955,228.858,229.988	229.393	215.500	25.000	13.893	347.325
423	228.955,228.392,227.963,228.858	228.542	215.500	25.000	13.042	326.050
424	228.392,228.443,228.686,227.963	228.371	215.500	25.000	12.871	321.775
425	228.443,228.6,229.409,228.686	228.785	215.500	25.000	13.285	332.125
426	228.6,228.73,229.33,229.409	229.017	215.500	25.000	13.517	337.925
427	228.73,227.41,227.849,229.33	228.330	215.500	25.000	12.830	320.750
428	227.41,226.29,226.368,227.849	226.979	215.500	25.000	11.479	286.975
429	226.29,225.352,225.114,226.368	225.781	215.500	25.000	10.281	257.025
430	225.352,224.635,224.176,225.114	224.819	215.500	25.000	9.319	232.975

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
431	224.635,223.601,223.139,224.176	223.888	215.500	25.000	8.388	209.700
432	223.601,222.573,222.083,223.139	222.849	215.500	25.000	7.349	183.725
433	222.573,223.075,222.403,222.083	222.534	215.500	25.000	7.034	175.850
434	223.075,220.088,219.992,219.992,222.213,222.403	221.294	215.500	24.918	5.794	144.375
435	219.12,222.213,219.992,219.12	220.111	215.500	6.836	4.611	31.521
436	215.25,215.747,215.584,215.262,215.233,215.25	215.388	215.500	10.218	-0.112	-1.144
437	215.747,217.144,217.09,215.584	216.391	215.500	25.000	0.891	22.275
438	217.144,219.437,219.581,217.09	218.313	215.500	25.000	2.813	70.325
439	219.437,222.2,221.881,219.581	220.775	215.500	25.000	5.275	131.875
440	222.2,224.055,223.445,221.881	222.895	215.500	25.000	7.395	184.875
441	224.055,225.564,224.903,223.445	224.492	215.500	25.000	8.992	224.800
442	225.564,226.346,225.62,224.903	225.608	215.500	25.000	10.108	252.700
443	226.346,229.649,228.256,225.62	227.467	215.500	25.000	11.967	299.175
444	229.649,231.673,231.035,228.256	230.153	215.500	25.000	14.653	366.325
445	231.673,230.525,230.573,231.035	230.951	215.500	25.000	15.451	386.275
446	230.525,229.658,230.048,230.573	230.201	215.500	25.000	14.701	367.525
447	229.658,229.023,229.609,230.048	229.585	215.500	25.000	14.085	352.125
448	229.023,228.197,229.213,229.609	229.011	215.500	25.000	13.511	337.775
449	228.197,227.371,228.594,229.213	228.344	215.500	25.000	12.844	321.100
450	227.371,227.02,228.061,228.594	227.762	215.500	25.000	12.262	306.550
451	227.02,228.188,227.611,228.061	227.720	215.500	25.000	12.220	305.500
452	228.188,227.609,226.535,227.611	227.486	215.500	25.000	11.986	299.650
453	227.609,226.121,225.598,226.535	226.466	215.500	25.000	10.966	274.150
454	226.121,224.35,225.795,225.598	225.466	215.500	25.000	9.966	249.150
455	224.35,224.559,224.251,225.795	224.738	215.500	25.000	9.238	230.950
456	224.559,224.362,222.234,224.251	223.851	215.500	25.000	8.351	208.775
457	224.362,223.912,222.754,222.754,222.234	223.203	215.500	14.600	7.703	112.464
458	223.648,223.591,225.904,224.412,223.648	224.241	215.500	22.894	8.741	200.116
459	223.591,223.567,227.27,225.904	225.083	215.500	25.000	9.583	239.575
460	223.567,223.719,225.5,227.27	225.014	215.500	25.000	9.514	237.850
461	223.719,225.771,228.001,225.5	225.748	215.500	25.000	10.248	256.200

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
462	225.771,228.379,228.925,228.001	227.769	215.500	25.000	12.269	306.725
463	228.379,228.714,227.424,228.925	228.360	215.500	25.000	12.860	321.500
464	228.714,229.147,227.051,227.424	228.084	215.500	25.000	12.584	314.600
465	229.147,230.224,228.397,227.051	228.705	215.500	25.000	13.205	330.125
466	230.224,263.529,252.079,228.397	243.557	215.500	25.000	28.057	701.425
467	263.529,308.025,254.464,252.079	269.524	215.500	25.000	54.024	1350.600
468	308.025,290.224,241.292,254.464	273.501	215.500	25.000	58.001	1450.025
469	290.224,246.802,232.275,241.292	252.648	215.500	25.000	37.148	928.700
470	246.802,231.679,232.282,232.275	235.759	215.500	25.000	20.259	506.475
471	231.679,231.321,232.177,232.282	231.865	215.500	25.000	16.365	409.125
472	231.321,231.101,231.924,232.177	231.631	215.500	25.000	16.131	403.275
473	231.101,230.981,231.251,231.924	231.314	215.500	25.000	15.814	395.350
474	230.981,230.223,230.579,231.251	230.758	215.500	25.000	15.258	381.450
475	230.223,229.72,229.769,230.579	230.073	215.500	25.000	14.573	364.325
476	229.72,229.157,228.955,229.769	229.400	215.500	25.000	13.900	347.500
477	229.157,228.674,228.392,228.955	228.795	215.500	25.000	13.295	332.375
478	228.674,228.655,228.443,228.392	228.541	215.500	25.000	13.041	326.025
479	228.655,228.466,228.6,228.443	228.541	215.500	25.000	13.041	326.025
480	228.466,228.263,228.73,228.6	228.515	215.500	25.000	13.015	325.375
481	228.263,227.493,227.41,228.73	227.974	215.500	25.000	12.474	311.850
482	227.493,226.249,226.29,227.41	226.861	215.500	25.000	11.361	284.025
483	226.249,224.682,225.352,226.29	225.643	215.500	25.000	10.143	253.575
484	224.682,224.156,224.635,225.352	224.706	215.500	25.000	9.206	230.150
485	224.156,224.014,223.601,224.635	224.102	215.500	25.000	8.602	215.050
486	224.014,223.243,222.573,223.601	223.358	215.500	25.000	7.858	196.450
487	223.243,222.063,223.075,222.573	222.739	215.500	25.000	7.239	180.975
488	222.063,221.055,220.088,220.088,223.075	221.274	215.500	14.927	5.774	86.188
489	215.276,216.156,215.747,215.25,215.276	215.541	215.500	14.313	0.041	0.587
490	216.156,218.113,217.144,215.747	216.790	215.500	25.000	1.290	32.250
491	218.113,219.036,219.437,217.144	218.432	215.500	25.000	2.932	73.300
492	219.036,223.055,222.2,219.437	220.932	215.500	25.000	5.432	135.800

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
493	223.055,225.015,224.055,222.2	223.581	215.500	25.000	8.081	202.025
494	225.015,224.791,225.564,224.055	224.856	215.500	25.000	9.356	233.900
495	224.791,226.139,226.346,225.564	225.710	215.500	25.000	10.210	255.250
496	226.139,229.474,229.649,226.346	227.902	215.500	25.000	12.402	310.050
497	229.474,230.896,231.673,229.649	230.423	215.500	25.000	14.923	373.075
498	230.896,230.199,230.525,231.673	230.823	215.500	25.000	15.323	383.075
499	230.199,230.074,229.658,230.525	230.114	215.500	25.000	14.614	365.350
500	230.074,229.069,229.023,229.658	229.456	215.500	25.000	13.956	348.900
501	229.069,227.755,228.197,229.023	228.511	215.500	25.000	13.011	325.275
502	227.755,226.202,227.371,228.197	227.382	215.500	25.000	11.882	297.050
503	226.202,224.45,227.02,227.371	226.261	215.500	25.000	10.761	269.025
504	224.45,225.896,228.188,227.02	226.388	215.500	25.000	10.888	272.200
505	225.896,226.817,227.609,228.188	227.128	215.500	25.000	11.628	290.700
506	226.817,225.99,226.121,227.609	226.634	215.500	25.000	11.134	278.350
507	225.99,223.98,224.35,226.121	225.110	215.500	25.000	9.610	240.250
508	223.98,222.435,224.559,224.35	223.831	215.500	25.000	8.331	208.275
509	222.435,222.892,224.362,224.559	223.562	215.500	25.000	8.062	201.550
510	222.892,222.858,221.263,223.912,223.912,224.362	223.200	215.500	24.049	7.700	185.177
511	222.858,223.776,223.591,223.648,219.817,221.263,221.263	222.317	215.500	23.755	6.817	161.938
512	223.776,224.053,223.567,223.591	223.747	215.500	25.000	8.247	206.175
513	224.053,225.831,223.719,223.567	224.293	215.500	25.000	8.793	219.825
514	225.831,226.992,225.771,223.719	225.578	215.500	25.000	10.078	251.950
515	226.992,228.5,228.379,225.771	227.411	215.500	25.000	11.911	297.775
516	228.5,229.431,228.714,228.379	228.756	215.500	25.000	13.256	331.400
517	229.431,229.811,229.147,228.714	229.276	215.500	25.000	13.776	344.400
518	229.811,230.039,230.224,229.147	229.805	215.500	25.000	14.305	357.625
519	230.039,238.386,263.529,230.224	240.544	215.500	25.000	25.044	626.100
520	238.386,244.234,308.025,263.529	263.543	215.500	25.000	48.043	1201.075
521	244.234,232.316,290.224,308.025	268.700	215.500	25.000	53.200	1330.000
522	232.316,231.615,246.802,290.224	250.239	215.500	25.000	34.739	868.475

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
523	231.615,231.067,231.679,246.802	235.291	215.500	25.000	19.791	494.775
524	231.067,230.383,231.321,231.679	231.113	215.500	25.000	15.613	390.325
525	230.383,230.114,231.101,231.321	230.730	215.500	25.000	15.230	380.750
526	230.114,230.144,230.981,231.101	230.585	215.500	25.000	15.085	377.125
527	230.144,230.077,230.223,230.981	230.356	215.500	25.000	14.856	371.400
528	230.077,229.64,229.72,230.223	229.915	215.500	25.000	14.415	360.375
529	229.64,229.208,229.157,229.72	229.431	215.500	25.000	13.931	348.275
530	229.208,228.796,228.674,229.157	228.959	215.500	25.000	13.459	336.475
531	228.796,228.416,228.655,228.674	228.636	215.500	25.000	13.136	328.400
532	228.416,228.201,228.466,228.655	228.435	215.500	25.000	12.935	323.375
533	228.201,227.97,228.263,228.466	228.225	215.500	25.000	12.725	318.125
534	227.97,227.588,227.493,228.263	227.828	215.500	25.000	12.328	308.200
535	227.588,226.095,226.249,227.493	226.856	215.500	25.000	11.356	283.900
536	226.095,224.17,224.682,226.249	225.299	215.500	25.000	9.799	244.975
537	224.17,224.146,224.156,224.682	224.288	215.500	25.000	8.788	219.700
538	224.146,223.743,224.014,224.156	224.015	215.500	25.000	8.515	212.875
539	223.743,222.86,223.243,224.014	223.465	215.500	25.000	7.965	199.125
540	222.86,221.215,221.42,221.42,222.063,223.243	222.037	215.500	21.839	6.537	142.762
541	221.055,222.063,221.42,221.055	221.398	215.500	1.261	5.898	7.437
542	215.155,219.981,216.156,215.276,215.283,215.155	216.168	215.500	18.508	0.668	12.363
543	219.981,222.458,218.113,216.156	219.177	215.500	25.000	3.677	91.925
544	222.458,221.914,219.036,218.113	220.380	215.500	25.000	4.880	122.000
545	221.914,225.262,223.055,219.036	222.317	215.500	25.000	6.817	170.425
546	225.262,226.331,225.015,223.055	224.916	215.500	25.000	9.416	235.400
547	226.331,225.281,224.791,225.015	225.354	215.500	25.000	9.854	246.350
548	225.281,225.927,226.139,224.791	225.534	215.500	25.000	10.034	250.850
549	225.927,229.078,229.474,226.139	227.654	215.500	25.000	12.154	303.850
550	229.078,227.068,230.896,229.474	229.129	215.500	25.000	13.629	340.725
551	227.068,227.279,230.199,230.896	228.861	215.500	25.000	13.361	334.025
552	227.279,228.499,230.074,230.199	229.013	215.500	25.000	13.513	337.825
553	228.499,229.518,229.069,230.074	229.290	215.500	25.000	13.790	344.750

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
554	229.518,227.586,227.755,229.069	228.482	215.500	25.000	12.982	324.550
555	227.586,225.428,226.202,227.755	226.743	215.500	25.000	11.243	281.075
556	225.428,224.802,224.45,226.202	225.221	215.500	25.000	9.721	243.025
557	224.802,223.893,225.896,224.45	224.760	215.500	25.000	9.260	231.500
558	223.893,225.101,226.817,225.896	225.427	215.500	25.000	9.927	248.175
559	225.101,225.105,225.99,226.817	225.753	215.500	25.000	10.253	256.325
560	225.105,224.948,223.98,225.99	225.006	215.500	25.000	9.506	237.650
561	224.948,223.73,222.435,223.98	223.773	215.500	25.000	8.273	206.825
562	223.73,222.545,222.892,222.435	222.900	215.500	25.000	7.400	185.000
563	222.545,222.592,222.858,222.892	222.722	215.500	25.000	7.222	180.550
564	222.592,224.128,223.776,222.858	223.339	215.500	25.000	7.839	195.975
565	224.128,224.652,224.053,223.776	224.152	215.500	25.000	8.652	216.300
566	224.652,227.459,225.831,224.053	225.499	215.500	25.000	9.999	249.975
567	227.459,227.05,226.992,225.831	226.833	215.500	25.000	11.333	283.325
568	227.05,228.704,228.5,226.992	227.811	215.500	25.000	12.311	307.775
569	228.704,228.374,229.431,228.5	228.752	215.500	25.000	13.252	331.300
570	228.374,228.75,229.811,229.431	229.092	215.500	25.000	13.592	339.800
571	228.75,229.541,230.039,229.811	229.535	215.500	25.000	14.035	350.875
572	229.541,230.638,238.386,230.039	232.151	215.500	25.000	16.651	416.275
573	230.638,230.797,244.234,238.386	236.014	215.500	25.000	20.514	512.850
574	230.797,230.962,232.316,244.234	234.577	215.500	25.000	19.077	476.925
575	230.962,231.386,231.615,232.316	231.570	215.500	25.000	16.070	401.750
576	231.386,231.09,231.067,231.615	231.290	215.500	25.000	15.790	394.750
577	231.09,230.832,230.383,231.067	230.843	215.500	25.000	15.343	383.575
578	230.832,229.891,230.114,230.383	230.305	215.500	25.000	14.805	370.125
579	229.891,229.774,230.144,230.114	229.981	215.500	25.000	14.481	362.025
580	229.774,228.766,230.077,230.144	229.690	215.500	25.000	14.190	354.750
581	228.766,228.838,229.64,230.077	229.330	215.500	25.000	13.830	345.750
582	228.838,228.851,229.208,229.64	229.134	215.500	25.000	13.634	340.850
583	228.851,229.036,228.796,229.208	228.973	215.500	25.000	13.473	336.825
584	229.036,228.693,228.416,228.796	228.735	215.500	25.000	13.235	330.875

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
585	228.693,228.349,228.201,228.416	228.415	215.500	25.000	12.915	322.875
586	228.349,227.96,227.97,228.201	228.120	215.500	25.000	12.620	315.500
587	227.96,227.511,227.588,227.97	227.757	215.500	25.000	12.257	306.425
588	227.511,225.747,226.095,227.588	226.735	215.500	25.000	11.235	280.875
589	225.747,223.651,224.17,226.095	224.916	215.500	25.000	9.416	235.400
590	223.651,223.672,224.146,224.17	223.910	215.500	25.000	8.410	210.250
591	223.672,223.757,223.743,224.146	223.829	215.500	25.000	8.329	208.225
592	223.757,221.41,221.261,221.261,222.86,223.743	222.382	215.500	24.864	6.882	171.114
593	221.215,222.86,221.261,221.215	221.638	215.500	6.408	6.138	39.332
594	214.98,215.566,215.058,214.98	215.146	215.500	0.618	-0.354	-0.219
595	215.566,221.046,219.981,215.155,215.058,215.058	216.977	215.500	24.037	1.477	35.503
596	221.046,225.469,222.458,219.981	222.239	215.500	25.000	6.739	168.475
597	225.469,226.676,221.914,222.458	224.129	215.500	25.000	8.629	215.725
598	226.676,227.455,225.262,221.914	225.327	215.500	25.000	9.827	245.675
599	227.455,225.914,226.331,225.262	226.240	215.500	25.000	10.740	268.500
600	225.914,223.212,225.281,226.331	225.184	215.500	25.000	9.684	242.100
601	223.212,223.618,225.927,225.281	224.509	215.500	25.000	9.009	225.225
602	223.618,227.633,229.078,225.927	226.564	215.500	25.000	11.064	276.600
603	227.633,226.142,227.068,229.078	227.480	215.500	25.000	11.980	299.500
604	226.142,224.632,227.279,227.068	226.280	215.500	25.000	10.780	269.500
605	224.632,225.851,228.499,227.279	226.565	215.500	25.000	11.065	276.625
606	225.851,226.544,229.518,228.499	227.603	215.500	25.000	12.103	302.575
607	226.544,225.394,227.586,229.518	227.260	215.500	25.000	11.760	294.000
608	225.394,224.244,225.428,227.586	225.663	215.500	25.000	10.163	254.075
609	224.244,221.105,224.802,225.428	223.895	215.500	25.000	8.395	209.875
610	221.105,223.087,223.893,224.802	223.222	215.500	25.000	7.722	193.050
611	223.087,223.767,225.101,223.893	223.962	215.500	25.000	8.462	211.550
612	223.767,224.706,225.105,225.101	224.670	215.500	25.000	9.170	229.250
613	224.706,223.906,224.948,225.105	224.666	215.500	25.000	9.166	229.150
614	223.906,223.183,223.73,224.948	223.942	215.500	25.000	8.442	211.050
615	223.183,222.407,222.545,223.73	222.966	215.500	25.000	7.466	186.650

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
616	222.407,223.885,222.592,222.545	222.857	215.500	25.000	7.357	183.925
617	223.885,224.987,224.128,222.592	223.898	215.500	25.000	8.398	209.950
618	224.987,226.481,224.652,224.128	225.062	215.500	25.000	9.562	239.050
619	226.481,228.897,227.459,224.652	226.872	215.500	25.000	11.372	284.300
620	228.897,228.388,227.05,227.459	227.948	215.500	25.000	12.448	311.200
621	228.388,229.07,228.704,227.05	228.303	215.500	25.000	12.803	320.075
622	229.07,227.674,228.374,228.704	228.455	215.500	25.000	12.955	323.875
623	227.674,227.773,228.75,228.374	228.143	215.500	25.000	12.643	316.075
624	227.773,229.26,229.541,228.75	228.831	215.500	25.000	13.331	333.275
625	229.26,230.349,230.638,229.541	229.947	215.500	25.000	14.447	361.175
626	230.349,230.572,230.797,230.638	230.589	215.500	25.000	15.089	377.225
627	230.572,230.782,230.962,230.797	230.778	215.500	25.000	15.278	381.950
628	230.782,231.076,231.386,230.962	231.051	215.500	25.000	15.551	388.775
629	231.076,231.223,231.09,231.386	231.194	215.500	25.000	15.694	392.350
630	231.223,230.824,230.832,231.09	230.992	215.500	25.000	15.492	387.300
631	230.824,229.926,229.891,230.832	230.368	215.500	25.000	14.868	371.700
632	229.926,228.582,229.774,229.891	229.544	215.500	25.000	14.044	351.100
633	228.582,227.142,228.766,229.774	228.566	215.500	25.000	13.066	326.650
634	227.142,226.23,228.838,228.766	227.744	215.500	25.000	12.244	306.100
635	226.23,227.899,228.851,228.838	227.954	215.500	25.000	12.454	311.350
636	227.899,228.992,229.036,228.851	228.694	215.500	25.000	13.194	329.850
637	228.992,228.873,228.693,229.036	228.898	215.500	25.000	13.398	334.950
638	228.873,228.559,228.349,228.693	228.618	215.500	25.000	13.118	327.950
639	228.559,227.279,227.96,228.349	228.037	215.500	25.000	12.537	313.425
640	227.279,225.775,227.511,227.96	227.131	215.500	25.000	11.631	290.775
641	225.775,224.081,225.747,227.511	225.779	215.500	25.000	10.279	256.975
642	224.081,222.659,223.651,225.747	224.034	215.500	25.000	8.534	213.350
643	222.659,223.36,223.672,223.651	223.335	215.500	25.000	7.835	195.875
644	223.36,223.136,223.757,223.672	223.481	215.500	25.000	7.981	199.525
645	223.136,221.02,222.041,221.41,221.41,223.757	222.129	215.500	15.333	6.629	101.642
646	215.815,215.566,214.98,214.98	215.335	215.500	2.586	-0.165	-0.427

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
647	215.815,220.917,221.046,215.566	218.336	215.500	25.000	2.836	70.900
648	220.917,225.239,225.469,221.046	223.168	215.500	25.000	7.668	191.700
649	225.239,227.775,226.676,225.469	226.290	215.500	25.000	10.790	269.750
650	227.775,225.174,227.455,226.676	226.770	215.500	25.000	11.270	281.750
651	225.174,224.551,225.914,227.455	225.774	215.500	25.000	10.274	256.850
652	224.551,222.094,223.212,225.914	223.943	215.500	25.000	8.443	211.075
653	222.094,220.569,223.618,223.212	222.373	215.500	25.000	6.873	171.825
654	220.569,224.719,227.633,223.618	224.135	215.500	25.000	8.635	215.875
655	224.719,225.745,226.142,227.633	226.060	215.500	25.000	10.560	264.000
656	225.745,222.232,224.632,226.142	224.688	215.500	25.000	9.188	229.700
657	222.232,223.534,225.851,224.632	224.062	215.500	25.000	8.562	214.050
658	223.534,225.401,226.544,225.851	225.332	215.500	25.000	9.832	245.800
659	225.401,225.185,225.394,226.544	225.631	215.500	25.000	10.131	253.275
660	225.185,224.716,224.244,225.394	224.885	215.500	25.000	9.385	234.625
661	224.716,222.499,221.105,224.244	223.141	215.500	25.000	7.641	191.025
662	222.499,222.043,223.087,221.105	222.184	215.500	25.000	6.684	167.100
663	222.043,222.194,223.767,223.087	222.773	215.500	25.000	7.273	181.825
664	222.194,223.913,224.706,223.767	223.645	215.500	25.000	8.145	203.625
665	223.913,224.197,223.906,224.706	224.180	215.500	25.000	8.680	217.000
666	224.197,222.833,223.183,223.906	223.529	215.500	25.000	8.029	200.725
667	222.833,223.711,222.407,223.183	223.034	215.500	25.000	7.534	188.350
668	223.711,224.883,223.885,222.407	223.722	215.500	25.000	8.222	205.550
669	224.883,226.872,224.987,223.885	225.157	215.500	25.000	9.657	241.425
670	226.872,227.477,226.481,224.987	226.454	215.500	25.000	10.954	273.850
671	227.477,227.825,228.897,226.481	227.670	215.500	25.000	12.170	304.250
672	227.825,228.231,228.388,228.897	228.335	215.500	25.000	12.835	320.875
673	228.231,228.617,229.07,228.388	228.576	215.500	25.000	13.076	326.900
674	228.617,229.307,227.674,229.07	228.667	215.500	25.000	13.167	329.175
675	229.307,229.469,227.773,227.674	228.556	215.500	25.000	13.056	326.400
676	229.469,230.082,229.26,227.773	229.146	215.500	25.000	13.646	341.150
677	230.082,230.422,230.349,229.26	230.028	215.500	25.000	14.528	363.200

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
678	230.422,230.197,230.572,230.349	230.385	215.500	25.000	14.885	372.125
679	230.197,229.941,230.782,230.572	230.373	215.500	25.000	14.873	371.825
680	229.941,230.473,231.076,230.782	230.568	215.500	25.000	15.068	376.700
681	230.473,230.27,231.223,231.076	230.760	215.500	25.000	15.260	381.500
682	230.27,229.926,230.824,231.223	230.561	215.500	25.000	15.061	376.525
683	229.926,228.435,229.926,230.824	229.778	215.500	25.000	14.278	356.950
684	228.435,227.262,228.582,229.926	228.551	215.500	25.000	13.051	326.275
685	227.262,225.699,227.142,228.582	227.171	215.500	25.000	11.671	291.775
686	225.699,225.863,226.23,227.142	226.233	215.500	25.000	10.733	268.325
687	225.863,226.877,227.899,226.23	226.717	215.500	25.000	11.217	280.425
688	226.877,228.119,228.992,227.899	227.972	215.500	25.000	12.472	311.800
689	228.119,226.288,228.873,228.992	228.068	215.500	25.000	12.568	314.200
690	226.288,224.917,228.559,228.873	227.159	215.500	25.000	11.659	291.475
691	224.917,224.248,227.279,228.559	226.251	215.500	25.000	10.751	268.775
692	224.248,223.58,225.775,227.279	225.220	215.500	25.000	9.720	243.000
693	223.58,222.659,224.081,225.775	224.024	215.500	25.000	8.524	213.100
694	222.659,221.593,222.659,224.081	222.748	215.500	25.000	7.248	181.200
695	221.593,221.756,223.36,222.659	222.342	215.500	25.000	6.842	171.050
696	221.756,219.226,223.136,223.36	221.870	215.500	25.000	6.370	159.250
697	219.226,217.811,217.826,217.826,217.881,217.881,221.02,223.136	219.076	215.500	19.816	3.576	70.862
698	214.889,215.986,215.815	215.563	215.500	3.074	0.063	0.194
699	215.986,220.661,220.917,215.815	218.345	215.500	25.000	2.845	71.125
700	220.661,222.329,225.239,220.917	222.286	215.500	25.000	6.786	169.650
701	222.329,223.166,227.775,225.239	224.627	215.500	25.000	9.127	228.175
702	223.166,222.72,225.174,227.775	224.709	215.500	25.000	9.209	230.225
703	222.72,222.134,224.551,225.174	223.645	215.500	25.000	8.145	203.625
704	222.134,220.975,222.094,224.551	222.438	215.500	25.000	6.938	173.450
705	220.975,220.565,220.569,222.094	221.051	215.500	25.000	5.551	138.775
706	220.565,222.642,224.719,220.569	222.124	215.500	25.000	6.624	165.600
707	222.642,226.016,225.745,224.719	224.781	215.500	25.000	9.281	232.025

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
708	226.016,226.204,222.232,225.745	225.049	215.500	25.000	9.549	238.725
709	226.204,226.307,223.534,222.232	224.569	215.500	25.000	9.069	226.725
710	226.307,226.271,225.401,223.534	225.378	215.500	25.000	9.878	246.950
711	226.271,225.783,225.185,225.401	225.660	215.500	25.000	10.160	254.000
712	225.783,225.237,224.716,225.185	225.230	215.500	25.000	9.730	243.250
713	225.237,224.027,222.499,224.716	224.120	215.500	25.000	8.620	215.500
714	224.027,222.005,222.043,222.499	222.644	215.500	25.000	7.144	178.600
715	222.005,220.768,222.194,222.043	221.753	215.500	25.000	6.253	156.325
716	220.768,222.589,223.913,222.194	222.366	215.500	25.000	6.866	171.650
717	222.589,224.1,224.197,223.913	223.700	215.500	25.000	8.200	205.000
718	224.1,224.81,222.833,224.197	223.985	215.500	25.000	8.485	212.125
719	224.81,224.632,223.711,222.833	223.996	215.500	25.000	8.496	212.400
720	224.632,225.235,224.883,223.711	224.615	215.500	25.000	9.115	227.875
721	225.235,225.322,226.872,224.883	225.578	215.500	25.000	10.078	251.950
722	225.322,226.023,227.477,226.872	226.423	215.500	25.000	10.923	273.075
723	226.023,226.591,227.825,227.477	226.979	215.500	25.000	11.479	286.975
724	226.591,226.887,228.231,227.825	227.383	215.500	25.000	11.883	297.075
725	226.887,227.134,228.617,228.231	227.717	215.500	25.000	12.217	305.425
726	227.134,227.434,229.307,228.617	228.123	215.500	25.000	12.623	315.575
727	227.434,226.639,229.469,229.307	228.212	215.500	25.000	12.712	317.800
728	226.639,227.784,230.082,229.469	228.493	215.500	25.000	12.993	324.825
729	227.784,229.062,230.422,230.082	229.337	215.500	25.000	13.837	345.925
730	229.062,229.152,230.197,230.422	229.708	215.500	25.000	14.208	355.200
731	229.152,229.108,229.941,230.197	229.599	215.500	25.000	14.099	352.475
732	229.108,228.863,230.473,229.941	229.596	215.500	25.000	14.096	352.400
733	228.863,228.359,230.27,230.473	229.491	215.500	25.000	13.991	349.775
734	228.359,227.639,229.926,230.27	229.048	215.500	25.000	13.548	338.700
735	227.639,226.876,228.435,229.926	228.219	215.500	25.000	12.719	317.975
736	226.876,225.883,227.262,228.435	227.114	215.500	25.000	11.614	290.350
737	225.883,225.488,225.699,227.262	226.083	215.500	25.000	10.583	264.575
738	225.488,225.953,225.863,225.699	225.751	215.500	25.000	10.251	256.275

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
739	225.953,226.417,226.877,225.863	226.277	215.500	25.000	10.777	269.425
740	226.417,226.249,228.119,226.877	226.915	215.500	25.000	11.415	285.375
741	226.249,223.87,226.288,228.119	226.131	215.500	25.000	10.631	265.775
742	223.87,224.205,224.917,226.288	224.820	215.500	25.000	9.320	233.000
743	224.205,224.3,224.248,224.917	224.418	215.500	25.000	8.918	222.950
744	224.3,223.802,223.58,224.248	223.983	215.500	25.000	8.483	212.075
745	223.802,222.776,222.659,223.58	223.204	215.500	25.000	7.704	192.600
746	222.776,221.388,221.593,222.659	222.104	215.500	25.000	6.604	165.100
747	221.388,219.737,221.756,221.593	221.118	215.500	25.000	5.618	140.450
748	219.737,217.755,217.782,217.782,219.226,221.756	219.006	215.500	21.307	3.506	74.702
749	217.811,219.226,217.782,217.811	218.157	215.500	4.293	2.657	11.407
750	215.022,215.986,214.889,214.888,215.022	215.161	215.500	1.705	-0.339	-0.578
751	215.233,218.618,220.661,215.986,215.022,215.233	216.792	215.500	22.283	1.292	28.790
752	218.618,216.829,222.329,220.661	219.609	215.500	25.000	4.109	102.725
753	216.829,217.506,223.166,222.329	219.958	215.500	25.000	4.458	111.450
754	217.506,220.914,222.72,223.166	221.076	215.500	25.000	5.576	139.400
755	220.914,219.716,222.134,222.72	221.371	215.500	25.000	5.871	146.775
756	219.716,220.364,220.975,222.134	220.797	215.500	25.000	5.297	132.425
757	220.364,222.148,220.565,220.975	221.013	215.500	25.000	5.513	137.825
758	222.148,223.935,222.642,220.565	222.322	215.500	25.000	6.822	170.550
759	223.935,225.775,226.016,222.642	224.592	215.500	25.000	9.092	227.300
760	225.775,228.248,226.204,226.016	226.561	215.500	25.000	11.061	276.525
761	228.248,227.376,226.307,226.204	227.034	215.500	25.000	11.534	288.350
762	227.376,226.801,226.271,226.307	226.689	215.500	25.000	11.189	279.725
763	226.801,226.963,225.783,226.271	226.455	215.500	25.000	10.955	273.875
764	226.963,226.584,225.237,225.783	226.142	215.500	25.000	10.642	266.050
765	226.584,225.446,224.027,225.237	225.324	215.500	25.000	9.824	245.600
766	225.446,223.757,222.005,224.027	223.809	215.500	25.000	8.309	207.725
767	223.757,222.196,220.768,222.005	222.182	215.500	25.000	6.682	167.050
768	222.196,221.517,222.589,220.768	221.768	215.500	25.000	6.268	156.700
769	221.517,221.767,224.1,222.589	222.494	215.500	25.000	6.994	174.850

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
770	221.767,222.634,224.81,224.1	223.328	215.500	25.000	7.828	195.700
771	222.634,224.076,224.632,224.81	224.038	215.500	25.000	8.538	213.450
772	224.076,224.185,225.235,224.632	224.532	215.500	25.000	9.032	225.800
773	224.185,223.461,225.322,225.235	224.551	215.500	25.000	9.051	226.275
774	223.461,224.52,226.023,225.322	224.832	215.500	25.000	9.332	233.300
775	224.52,226.13,226.591,226.023	225.816	215.500	25.000	10.316	257.900
776	226.13,226.268,226.887,226.591	226.469	215.500	25.000	10.969	274.225
777	226.268,226.844,227.134,226.887	226.783	215.500	25.000	11.283	282.075
778	226.844,226.923,227.434,227.134	227.084	215.500	25.000	11.584	289.600
779	226.923,226.428,226.639,227.434	226.856	215.500	25.000	11.356	283.900
780	226.428,227.624,227.784,226.639	227.119	215.500	25.000	11.619	290.475
781	227.624,227.627,229.062,227.784	228.024	215.500	25.000	12.524	313.100
782	227.627,227.543,229.152,229.062	228.346	215.500	25.000	12.846	321.150
783	227.543,226.768,229.108,229.152	228.143	215.500	25.000	12.643	316.075
784	226.768,226.297,228.863,229.108	227.759	215.500	25.000	12.259	306.475
785	226.297,226.199,228.359,228.863	227.429	215.500	25.000	11.929	298.225
786	226.199,225.445,227.639,228.359	226.911	215.500	25.000	11.411	285.275
787	225.445,224.664,226.876,227.639	226.156	215.500	25.000	10.656	266.400
788	224.664,224.821,225.883,226.876	225.561	215.500	25.000	10.061	251.525
789	224.821,224.336,225.488,225.883	225.132	215.500	25.000	9.632	240.800
790	224.336,224.059,225.953,225.488	224.959	215.500	25.000	9.459	236.475
791	224.059,224.361,226.417,225.953	225.197	215.500	25.000	9.697	242.425
792	224.361,223.198,226.249,226.417	225.056	215.500	25.000	9.556	238.900
793	223.198,223.627,223.87,226.249	224.236	215.500	25.000	8.736	218.400
794	223.627,224.108,224.205,223.87	223.952	215.500	25.000	8.452	211.300
795	224.108,224.59,224.3,224.205	224.301	215.500	25.000	8.801	220.025
796	224.59,223.801,223.802,224.3	224.123	215.500	25.000	8.623	215.575
797	223.801,222.802,222.776,223.802	223.295	215.500	25.000	7.795	194.875
798	222.802,218.264,221.388,222.776	221.308	215.500	25.000	5.808	145.200
799	218.264,217.699,217.738,217.738,219.737,221.388	218.761	215.500	17.240	3.261	56.220
800	217.755,219.737,217.738,217.755	218.246	215.500	1.460	2.746	4.009

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
801	215.557,218.618,215.233,215.557	216.241	215.500	6.420	0.741	4.757
802	215.615,218.617,216.829,218.618,215.557,215.615	216.809	215.500	24.793	1.309	32.454
803	218.617,218.433,217.506,216.829	217.846	215.500	25.000	2.346	58.650
804	218.433,219.763,220.914,217.506	219.154	215.500	25.000	3.654	91.350
805	219.763,220.403,219.716,220.914	220.199	215.500	25.000	4.699	117.475
806	220.403,221.145,220.364,219.716	220.407	215.500	25.000	4.907	122.675
807	221.145,223.358,222.148,220.364	221.754	215.500	25.000	6.254	156.350
808	223.358,225.099,223.935,222.148	223.635	215.500	25.000	8.135	203.375
809	225.099,226.698,225.775,223.935	225.377	215.500	25.000	9.877	246.925
810	226.698,227.441,228.248,225.775	227.040	215.500	25.000	11.540	288.500
811	227.441,226.827,227.376,228.248	227.473	215.500	25.000	11.973	299.325
812	226.827,227.101,226.801,227.376	227.026	215.500	25.000	11.526	288.150
813	227.101,227.968,226.963,226.801	227.209	215.500	25.000	11.709	292.725
814	227.968,227.379,226.584,226.963	227.224	215.500	25.000	11.724	293.100
815	227.379,225.708,225.446,226.584	226.279	215.500	25.000	10.779	269.475
816	225.708,223.883,223.757,225.446	224.698	215.500	25.000	9.198	229.950
817	223.883,222.803,222.196,223.757	223.160	215.500	25.000	7.660	191.500
818	222.803,222.285,221.517,222.196	222.201	215.500	25.000	6.701	167.525
819	222.285,222.04,221.767,221.517	221.902	215.500	25.000	6.402	160.050
820	222.04,222.747,222.634,221.767	222.297	215.500	25.000	6.797	169.925
821	222.747,223.861,224.076,222.634	223.330	215.500	25.000	7.830	195.750
822	223.861,223.842,224.185,224.076	223.991	215.500	25.000	8.491	212.275
823	223.842,223.075,223.461,224.185	223.641	215.500	25.000	8.141	203.525
824	223.075,224.365,224.52,223.461	223.855	215.500	25.000	8.355	208.875
825	224.365,226.019,226.13,224.52	225.259	215.500	25.000	9.759	243.975
826	226.019,226.779,226.268,226.13	226.299	215.500	25.000	10.799	269.975
827	226.779,227.486,226.844,226.268	226.844	215.500	25.000	11.344	283.600
828	227.486,228.044,226.923,226.844	227.324	215.500	25.000	11.824	295.600
829	228.044,227.899,226.428,226.923	227.324	215.500	25.000	11.824	295.600
830	227.899,227.884,227.624,226.428	227.459	215.500	25.000	11.959	298.975
831	227.884,226.609,227.627,227.624	227.436	215.500	25.000	11.936	298.400

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
832	226.609,225.294,227.543,227.627	226.768	215.500	25.000	11.268	281.700
833	225.294,225.954,226.768,227.543	226.390	215.500	25.000	10.890	272.250
834	225.954,225.173,226.297,226.768	226.048	215.500	25.000	10.548	263.700
835	225.173,225.723,226.199,226.297	225.848	215.500	25.000	10.348	258.700
836	225.723,225.444,225.445,226.199	225.703	215.500	25.000	10.203	255.075
837	225.444,224.744,224.664,225.445	225.074	215.500	25.000	9.574	239.350
838	224.744,224.58,224.821,224.664	224.702	215.500	25.000	9.202	230.050
839	224.58,223.87,224.336,224.821	224.402	215.500	25.000	8.902	222.550
840	223.87,223.196,224.059,224.336	223.865	215.500	25.000	8.365	209.125
841	223.196,222.981,224.361,224.059	223.649	215.500	25.000	8.149	203.725
842	222.981,223.285,223.198,224.361	223.456	215.500	25.000	7.956	198.900
843	223.285,223.15,223.627,223.198	223.315	215.500	25.000	7.815	195.375
844	223.15,223.384,224.108,223.627	223.567	215.500	25.000	8.067	201.675
845	223.384,223.671,224.59,224.108	223.938	215.500	25.000	8.438	210.950
846	223.671,221.991,223.801,224.59	223.513	215.500	25.000	8.013	200.325
847	221.991,217.644,217.651,217.651,222.802,223.801	220.257	215.500	24.730	4.757	117.641
848	217.695,218.264,222.802,217.651,217.695	218.821	215.500	11.952	3.321	39.693
849	217.699,218.264,217.695,217.699	217.839	215.500	0.119	2.339	0.278
850	215.716,215.322,218.617,215.615,215.888,215.716	216.146	215.500	13.082	0.646	8.451
851	215.322,217.464,218.433,218.617	217.459	215.500	25.000	1.959	48.975
852	217.464,218.319,219.763,218.433	218.495	215.500	25.000	2.995	74.875
853	218.319,219.941,220.403,219.763	219.606	215.500	25.000	4.106	102.650
854	219.941,223.284,221.145,220.403	221.193	215.500	25.000	5.693	142.325
855	223.284,225.434,223.358,221.145	223.305	215.500	25.000	7.805	195.125
856	225.434,225.316,225.099,223.358	224.802	215.500	25.000	9.302	232.550
857	225.316,226.393,226.698,225.099	225.876	215.500	25.000	10.376	259.400
858	226.393,227.184,227.441,226.698	226.929	215.500	25.000	11.429	285.725
859	227.184,227.286,226.827,227.441	227.184	215.500	25.000	11.684	292.100
860	227.286,226.833,227.101,226.827	227.012	215.500	25.000	11.512	287.800
861	226.833,228.107,227.968,227.101	227.502	215.500	25.000	12.002	300.050
862	228.107,227.603,227.379,227.968	227.764	215.500	25.000	12.264	306.600

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
863	227.603,226.153,225.708,227.379	226.711	215.500	25.000	11.211	280.275
864	226.153,224.212,223.883,225.708	224.989	215.500	25.000	9.489	237.225
865	224.212,223.702,222.803,223.883	223.650	215.500	25.000	8.150	203.750
866	223.702,223.351,222.285,222.803	223.035	215.500	25.000	7.535	188.375
867	223.351,222.999,222.04,222.285	222.669	215.500	25.000	7.169	179.225
868	222.999,223.581,222.747,222.04	222.842	215.500	25.000	7.342	183.550
869	223.581,224.545,223.861,222.747	223.684	215.500	25.000	8.184	204.600
870	224.545,224.101,223.842,223.861	224.087	215.500	25.000	8.587	214.675
871	224.101,223.27,223.075,223.842	223.572	215.500	25.000	8.072	201.800
872	223.27,224.269,224.365,223.075	223.745	215.500	25.000	8.245	206.125
873	224.269,225.836,226.019,224.365	225.122	215.500	25.000	9.622	240.550
874	225.836,227.19,226.779,226.019	226.456	215.500	25.000	10.956	273.900
875	227.19,228.077,227.486,226.779	227.383	215.500	25.000	11.883	297.075
876	228.077,228.458,228.044,227.486	228.016	215.500	25.000	12.516	312.900
877	228.458,228.826,227.899,228.044	228.307	215.500	25.000	12.807	320.175
878	228.826,228.21,227.884,227.899	228.205	215.500	25.000	12.705	317.625
879	228.21,227.224,226.609,227.884	227.482	215.500	25.000	11.982	299.550
880	227.224,226.294,225.294,226.609	226.355	215.500	25.000	10.855	271.375
881	226.294,226.723,225.954,225.294	226.066	215.500	25.000	10.566	264.150
882	226.723,227.131,225.173,225.954	226.245	215.500	25.000	10.745	268.625
883	227.131,226.991,225.723,225.173	226.254	215.500	25.000	10.754	268.850
884	226.991,226.171,225.444,225.723	226.082	215.500	25.000	10.582	264.550
885	226.171,225.318,224.744,225.444	225.419	215.500	25.000	9.919	247.975
886	225.318,224.351,224.58,224.744	224.748	215.500	25.000	9.248	231.200
887	224.351,223.554,223.87,224.58	224.089	215.500	25.000	8.589	214.725
888	223.554,222.855,223.196,223.87	223.369	215.500	25.000	7.869	196.725
889	222.855,223.354,222.981,223.196	223.097	215.500	25.000	7.597	189.925
890	223.354,223.371,223.285,222.981	223.248	215.500	25.000	7.748	193.700
891	223.371,222.887,223.15,223.285	223.173	215.500	25.000	7.673	191.825
892	222.887,223.122,223.384,223.15	223.136	215.500	25.000	7.636	190.900
893	223.122,220.245,223.671,223.384	222.606	215.500	25.000	7.106	177.650

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
894	220.245,217.621,217.61,217.61,221.991,223.671	219.791	215.500	23.046	4.291	98.890
895	217.644,221.991,217.61,217.609,217.644	218.500	215.500	6.814	3.000	20.442
896	215.652,215.322,215.716,215.652	215.585	215.500	0.136	0.085	0.012
897	215.116,215.245,217.464,215.322,215.652,215.116	215.652	215.500	15.294	0.152	2.325
898	215.245,218.674,218.319,217.464	217.425	215.500	25.000	1.925	48.125
899	218.674,219.816,219.941,218.319	219.187	215.500	25.000	3.687	92.175
900	219.816,223.583,223.284,219.941	221.656	215.500	25.000	6.156	153.900
901	223.583,227.611,225.434,223.284	224.978	215.500	25.000	9.478	236.950
902	227.611,226.955,225.316,225.434	226.329	215.500	25.000	10.829	270.725
903	226.955,226.962,226.393,225.316	226.407	215.500	25.000	10.907	272.675
904	226.962,228.068,227.184,226.393	227.152	215.500	25.000	11.652	291.300
905	228.068,228.805,227.286,227.184	227.836	215.500	25.000	12.336	308.400
906	228.805,227.911,226.833,227.286	227.708	215.500	25.000	12.208	305.200
907	227.911,227.476,228.107,226.833	227.582	215.500	25.000	12.082	302.050
908	227.476,227.647,227.603,228.107	227.708	215.500	25.000	12.208	305.200
909	227.647,226.818,226.153,227.603	227.055	215.500	25.000	11.555	288.875
910	226.818,225.154,224.212,226.153	225.584	215.500	25.000	10.084	252.100
911	225.154,224.584,223.702,224.212	224.413	215.500	25.000	8.913	222.825
912	224.584,224.734,223.351,223.702	224.093	215.500	25.000	8.593	214.825
913	224.734,224.84,222.999,223.351	223.981	215.500	25.000	8.481	212.025
914	224.84,224.31,223.581,222.999	223.932	215.500	25.000	8.432	210.800
915	224.31,223.769,224.545,223.581	224.051	215.500	25.000	8.551	213.775
916	223.769,222.942,224.101,224.545	223.839	215.500	25.000	8.339	208.475
917	222.942,223.477,223.27,224.101	223.447	215.500	25.000	7.947	198.675
918	223.477,224.498,224.269,223.27	223.878	215.500	25.000	8.378	209.450
919	224.498,225.623,225.836,224.269	225.056	215.500	25.000	9.556	238.900
920	225.623,226.531,227.19,225.836	226.295	215.500	25.000	10.795	269.875
921	226.531,226.544,228.077,227.19	227.085	215.500	25.000	11.585	289.625
922	226.544,226.712,228.458,228.077	227.447	215.500	25.000	11.947	298.675
923	226.712,227.019,228.826,228.458	227.754	215.500	25.000	12.254	306.350
924	227.019,226.882,228.21,228.826	227.734	215.500	25.000	12.234	305.850

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
925	226.882,226.276,227.224,228.21	227.148	215.500	25.000	11.648	291.200
926	226.276,225.809,226.294,227.224	226.401	215.500	25.000	10.901	272.525
927	225.809,226.356,226.723,226.294	226.295	215.500	25.000	10.795	269.875
928	226.356,226.786,227.131,226.723	226.749	215.500	25.000	11.249	281.225
929	226.786,226.574,226.991,227.131	226.870	215.500	25.000	11.370	284.250
930	226.574,226.325,226.171,226.991	226.515	215.500	25.000	11.015	275.375
931	226.325,226.083,225.318,226.171	225.974	215.500	25.000	10.474	261.850
932	226.083,224.841,224.351,225.318	225.148	215.500	25.000	9.648	241.200
933	224.841,223.345,223.554,224.351	224.023	215.500	25.000	8.523	213.075
934	223.345,222.503,222.855,223.554	223.064	215.500	25.000	7.564	189.100
935	222.503,223.621,223.354,222.855	223.083	215.500	25.000	7.583	189.575
936	223.621,223.379,223.371,223.354	223.431	215.500	25.000	7.931	198.275
937	223.379,222.861,222.887,223.371	223.125	215.500	25.000	7.625	190.625
938	222.861,218.803,223.122,222.887	221.918	215.500	25.000	6.418	160.450
939	218.803,217.653,217.635,217.635,220.245,223.122	219.182	215.500	19.592	3.682	72.138
940	217.621,220.245,217.635,217.621	218.281	215.500	2.904	2.781	8.076
941	215.035,215.245,215.116,215.035	215.107	215.500	0.223	-0.393	-0.088
942	216.388,216.939,218.674,215.245,215.035,214.795,216.388	216.209	215.500	19.952	0.709	14.146
943	216.939,220.187,219.816,218.674	218.904	215.500	25.000	3.404	85.100
944	220.187,223.52,223.583,219.816	221.776	215.500	25.000	6.276	156.900
945	223.52,225.436,227.611,223.583	225.037	215.500	25.000	9.537	238.425
946	225.436,226.761,226.955,227.611	226.691	215.500	25.000	11.191	279.775
947	226.761,227.699,226.962,226.955	227.094	215.500	25.000	11.594	289.850
948	227.699,228.262,228.068,226.962	227.748	215.500	25.000	12.248	306.200
949	228.262,228.497,228.805,228.068	228.408	215.500	25.000	12.908	322.700
950	228.497,228.276,227.911,228.805	228.372	215.500	25.000	12.872	321.800
951	228.276,227.604,227.476,227.911	227.817	215.500	25.000	12.317	307.925
952	227.604,227.802,227.647,227.476	227.632	215.500	25.000	12.132	303.300
953	227.802,227.176,226.818,227.647	227.361	215.500	25.000	11.861	296.525
954	227.176,225.203,225.154,226.818	226.088	215.500	25.000	10.588	264.700

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
955	225.203,224.387,224.584,225.154	224.832	215.500	25.000	9.332	233.300
956	224.387,224.1,224.734,224.584	224.451	215.500	25.000	8.951	223.775
957	224.1,225.411,224.84,224.734	224.771	215.500	25.000	9.271	231.775
958	225.411,223.663,224.31,224.84	224.556	215.500	25.000	9.056	226.400
959	223.663,221.774,223.769,224.31	223.379	215.500	25.000	7.879	196.975
960	221.774,222.27,222.942,223.769	222.689	215.500	25.000	7.189	179.725
961	222.27,223.326,223.477,222.942	223.004	215.500	25.000	7.504	187.600
962	223.326,224.28,224.498,223.477	223.895	215.500	25.000	8.395	209.875
963	224.28,225.235,225.623,224.498	224.909	215.500	25.000	9.409	235.225
964	225.235,225.319,226.531,225.623	225.677	215.500	25.000	10.177	254.425
965	225.319,225.344,226.544,226.531	225.934	215.500	25.000	10.434	260.850
966	225.344,225.301,226.712,226.544	225.975	215.500	25.000	10.475	261.875
967	225.301,225.596,227.019,226.712	226.157	215.500	25.000	10.657	266.425
968	225.596,225.564,226.882,227.019	226.265	215.500	25.000	10.765	269.125
969	225.564,225.113,226.276,226.882	225.959	215.500	25.000	10.459	261.475
970	225.113,224.712,225.809,226.276	225.477	215.500	25.000	9.977	249.425
971	224.712,225.33,226.356,225.809	225.552	215.500	25.000	10.052	251.300
972	225.33,225.945,226.786,226.356	226.104	215.500	25.000	10.604	265.100
973	225.945,226.021,226.574,226.786	226.331	215.500	25.000	10.831	270.775
974	226.021,226.41,226.325,226.574	226.332	215.500	25.000	10.832	270.800
975	226.41,226.13,226.083,226.325	226.237	215.500	25.000	10.737	268.425
976	226.13,225.193,224.841,226.083	225.562	215.500	25.000	10.062	251.550
977	225.193,223.599,223.345,224.841	224.245	215.500	25.000	8.745	218.625
978	223.599,222.616,222.503,223.345	223.016	215.500	25.000	7.516	187.900
979	222.616,222.887,223.621,222.503	222.907	215.500	25.000	7.407	185.175
980	222.887,222.97,223.379,223.621	223.214	215.500	25.000	7.714	192.850
981	222.97,217.686,217.684,217.684,222.861,223.379	220.377	215.500	24.977	4.877	121.813
982	217.66,218.803,222.861,217.684,217.66	218.934	215.500	14.439	3.434	49.584
983	217.653,218.803,217.66,217.653	217.942	215.500	0.603	2.442	1.473
984	217.93,216.939,216.388	217.086	215.500	8.116	1.586	12.872
985	217.93,221.498,220.187,216.939	219.139	215.500	25.000	3.639	90.975

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
986	221.498,223.325,223.52,220.187	222.133	215.500	25.000	6.633	165.825
987	223.325,224.498,225.436,223.52	224.195	215.500	25.000	8.695	217.375
988	224.498,227.028,226.761,225.436	225.931	215.500	25.000	10.431	260.775
989	227.028,226.399,227.699,226.761	226.972	215.500	25.000	11.472	286.800
990	226.399,226.948,228.262,227.699	227.327	215.500	25.000	11.827	295.675
991	226.948,227.838,228.497,228.262	227.886	215.500	25.000	12.386	309.650
992	227.838,227.676,228.276,228.497	228.072	215.500	25.000	12.572	314.300
993	227.676,227.088,227.604,228.276	227.661	215.500	25.000	12.161	304.025
994	227.088,226.241,227.802,227.604	227.184	215.500	25.000	11.684	292.100
995	226.241,225.66,227.176,227.802	226.720	215.500	25.000	11.220	280.500
996	225.66,222.408,225.203,227.176	225.112	215.500	25.000	9.612	240.300
997	222.408,221.987,224.387,225.203	223.496	215.500	25.000	7.996	199.900
998	221.987,224.161,224.1,224.387	223.659	215.500	25.000	8.159	203.975
999	224.161,225.15,225.411,224.1	224.706	215.500	25.000	9.206	230.150
1000	225.15,224.267,223.663,225.411	224.623	215.500	25.000	9.123	228.075
1001	224.267,222.16,221.774,223.663	222.966	215.500	25.000	7.466	186.650
1002	222.16,221.237,222.27,221.774	221.860	215.500	25.000	6.360	159.000
1003	221.237,222.299,223.326,222.27	222.283	215.500	25.000	6.783	169.575
1004	222.299,223.361,224.28,223.326	223.317	215.500	25.000	7.817	195.425
1005	223.361,224.43,225.235,224.28	224.327	215.500	25.000	8.827	220.675
1006	224.43,225.058,225.319,225.235	225.010	215.500	25.000	9.510	237.750
1007	225.058,225.655,225.344,225.319	225.344	215.500	25.000	9.844	246.100
1008	225.655,225.836,225.301,225.344	225.534	215.500	25.000	10.034	250.850
1009	225.836,225.112,225.596,225.301	225.461	215.500	25.000	9.961	249.025
1010	225.112,224.506,225.564,225.596	225.194	215.500	25.000	9.694	242.350
1011	224.506,224.01,225.113,225.564	224.798	215.500	25.000	9.298	232.450
1012	224.01,224.547,224.712,225.113	224.595	215.500	25.000	9.095	227.375
1013	224.547,224.747,225.33,224.712	224.834	215.500	25.000	9.334	233.350
1014	224.747,224.445,225.945,225.33	225.117	215.500	25.000	9.617	240.425
1015	224.445,224.392,226.021,225.945	225.201	215.500	25.000	9.701	242.525
1016	224.392,223.52,226.41,226.021	225.086	215.500	25.000	9.586	239.650

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
1017	223.52,222.274,226.13,226.41	224.583	215.500	25.000	9.083	227.075
1018	222.274,222.732,225.193,226.13	224.082	215.500	25.000	8.582	214.550
1019	222.732,223.219,223.599,225.193	223.686	215.500	25.000	8.186	204.650
1020	223.219,222.778,222.616,223.599	223.053	215.500	25.000	7.553	188.825
1021	222.778,219.208,222.887,222.616	221.872	215.500	25.000	6.372	159.300
1022	219.208,217.718,217.709,217.709,222.97,222.887	219.700	215.500	23.836	4.200	100.111
1023	217.686,222.97,217.709,217.686	219.013	215.500	8.707	3.513	30.588
1024	218.867,221.498,217.93	219.432	215.500	12.500	3.932	49.150
1025	218.867,220.133,223.325,221.498	220.956	215.500	25.000	5.456	136.400
1026	220.133,222.271,224.498,223.325	222.557	215.500	25.000	7.057	176.425
1027	222.271,223.901,227.028,224.498	224.424	215.500	25.000	8.924	223.100
1028	223.901,223.831,226.399,227.028	225.290	215.500	25.000	9.790	244.750
1029	223.831,224.782,226.948,226.399	225.490	215.500	25.000	9.990	249.750
1030	224.782,225.657,227.838,226.948	226.306	215.500	25.000	10.806	270.150
1031	225.657,226.181,227.676,227.838	226.838	215.500	25.000	11.338	283.450
1032	226.181,226.173,227.088,227.676	226.780	215.500	25.000	11.280	282.000
1033	226.173,225.421,226.241,227.088	226.231	215.500	25.000	10.731	268.275
1034	225.421,224.168,225.66,226.241	225.372	215.500	25.000	9.872	246.800
1035	224.168,220.419,222.408,225.66	223.164	215.500	25.000	7.664	191.600
1036	220.419,221.595,221.987,222.408	221.602	215.500	25.000	6.102	152.550
1037	221.595,223.143,224.161,221.987	222.722	215.500	25.000	7.222	180.550
1038	223.143,222.67,225.15,224.161	223.781	215.500	25.000	8.281	207.025
1039	222.67,223.121,224.267,225.15	223.802	215.500	25.000	8.302	207.550
1040	223.121,222.678,222.16,224.267	223.057	215.500	25.000	7.557	188.925
1041	222.678,220.503,221.237,222.16	221.645	215.500	25.000	6.145	153.625
1042	220.503,221.621,222.299,221.237	221.415	215.500	25.000	5.915	147.875
1043	221.621,222.399,223.361,222.299	222.420	215.500	25.000	6.920	173.000
1044	222.399,223.288,224.43,223.361	223.370	215.500	25.000	7.870	196.750
1045	223.288,224.808,225.058,224.43	224.396	215.500	25.000	8.896	222.400
1046	224.808,225.854,225.655,225.058	225.344	215.500	25.000	9.844	246.100
1047	225.854,223.164,225.836,225.655	225.127	215.500	25.000	9.627	240.675

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
1048	223.164,224.232,225.112,225.836	224.586	215.500	25.000	9.086	227.150
1049	224.232,223.739,224.506,225.112	224.397	215.500	25.000	8.897	222.425
1050	223.739,223.009,224.01,224.506	223.816	215.500	25.000	8.316	207.900
1051	223.009,224.383,224.547,224.01	223.987	215.500	25.000	8.487	212.175
1052	224.383,223.928,224.747,224.547	224.401	215.500	25.000	8.901	222.525
1053	223.928,223.262,224.445,224.747	224.096	215.500	25.000	8.596	214.900
1054	223.262,222.649,224.392,224.445	223.687	215.500	25.000	8.187	204.675
1055	222.649,223.225,223.52,224.392	223.447	215.500	25.000	7.947	198.675
1056	223.225,223.257,222.274,223.52	223.069	215.500	25.000	7.569	189.225
1057	223.257,223.501,222.732,222.274	222.941	215.500	25.000	7.441	186.025
1058	223.501,222.695,223.219,222.732	223.037	215.500	25.000	7.537	188.425
1059	222.695,222.206,222.778,223.219	222.725	215.500	25.000	7.225	180.625
1060	222.206,217.655,217.7,217.7,219.208,222.778	219.541	215.500	21.715	4.041	87.750
1061	217.718,219.208,217.7,217.726,217.718	218.014	215.500	4.194	2.514	10.544
1062	217.041,218.147,220.133,218.867,216.915,217.041	218.024	215.500	22.772	2.524	57.477
1063	218.147,220.687,222.271,220.133	220.310	215.500	25.000	4.810	120.250
1064	220.687,219.735,223.901,222.271	221.649	215.500	25.000	6.149	153.725
1065	219.735,220.313,223.831,223.901	221.945	215.500	25.000	6.445	161.125
1066	220.313,221.379,224.782,223.831	222.576	215.500	25.000	7.076	176.900
1067	221.379,222.23,225.657,224.782	223.512	215.500	25.000	8.012	200.300
1068	222.23,222.909,226.181,225.657	224.244	215.500	25.000	8.744	218.600
1069	222.909,223.612,226.173,226.181	224.719	215.500	25.000	9.219	230.475
1070	223.612,223.264,225.421,226.173	224.617	215.500	25.000	9.117	227.925
1071	223.264,221.911,224.168,225.421	223.691	215.500	25.000	8.191	204.775
1072	221.911,222.104,220.419,224.168	222.151	215.500	25.000	6.651	166.275
1073	222.104,222.081,221.595,220.419	221.550	215.500	25.000	6.050	151.250
1074	222.081,220.631,223.143,221.595	221.863	215.500	25.000	6.363	159.075
1075	220.631,220.231,222.67,223.143	221.669	215.500	25.000	6.169	154.225
1076	220.231,222.089,223.121,222.67	222.028	215.500	25.000	6.528	163.200
1077	222.089,221.596,222.678,223.121	222.371	215.500	25.000	6.871	171.775
1078	221.596,220.583,220.503,222.678	221.340	215.500	25.000	5.840	146.000

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
1079	220.583,220.598,221.621,220.503	220.826	215.500	25.000	5.326	133.150
1080	220.598,221.122,222.399,221.621	221.435	215.500	25.000	5.935	148.375
1081	221.122,222.443,223.288,222.399	222.313	215.500	25.000	6.813	170.325
1082	222.443,223.475,224.808,223.288	223.503	215.500	25.000	8.003	200.075
1083	223.475,223.93,225.854,224.808	224.517	215.500	25.000	9.017	225.425
1084	223.93,222.516,223.164,225.854	223.866	215.500	25.000	8.366	209.150
1085	222.516,223.06,224.232,223.164	223.243	215.500	25.000	7.743	193.575
1086	223.06,222.693,223.739,224.232	223.431	215.500	25.000	7.931	198.275
1087	222.693,222.302,223.009,223.739	222.936	215.500	25.000	7.436	185.900
1088	222.302,221.79,224.383,223.009	222.871	215.500	25.000	7.371	184.275
1089	221.79,222.346,223.928,224.383	223.112	215.500	25.000	7.612	190.300
1090	222.346,221.586,223.262,223.928	222.781	215.500	25.000	7.281	182.025
1091	221.586,222.254,222.649,223.262	222.438	215.500	25.000	6.938	173.450
1092	222.254,223.641,223.225,222.649	222.943	215.500	25.000	7.443	186.075
1093	223.641,223.983,223.257,223.225	223.527	215.500	25.000	8.027	200.675
1094	223.983,222.521,223.501,223.257	223.316	215.500	25.000	7.816	195.400
1095	222.521,220.945,222.695,223.501	222.416	215.500	25.000	6.916	172.900
1096	220.945,217.559,217.619,217.619,222.206,222.695	219.774	215.500	19.291	4.274	82.450
1097	217.655,222.206,217.619,217.655	218.784	215.500	2.092	3.284	6.870
1098	217.121,218.147,217.041,217.121	217.357	215.500	0.615	1.857	1.142
1099	220.687,218.147,217.121	218.652	215.500	1.785	3.152	5.626
1100	218.71,220.313,219.735	219.586	215.500	12.500	4.086	51.075
1101	218.71,218.736,221.379,220.313	219.784	215.500	25.000	4.284	107.100
1102	218.736,219.74,222.23,221.379	220.521	215.500	25.000	5.021	125.525
1103	219.74,220.813,222.909,222.23	221.423	215.500	25.000	5.923	148.075
1104	220.813,221.191,223.612,222.909	222.131	215.500	25.000	6.631	165.775
1105	221.191,220.891,223.264,223.612	222.240	215.500	25.000	6.740	168.500
1106	220.891,221.901,221.911,223.264	221.992	215.500	25.000	6.492	162.300
1107	221.901,222.106,222.104,221.911	222.005	215.500	25.000	6.505	162.625
1108	222.106,222.185,222.081,222.104	222.119	215.500	25.000	6.619	165.475
1109	222.185,221.402,220.631,222.081	221.575	215.500	25.000	6.075	151.875

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
1110	221.402,222.779,220.231,220.631	221.261	215.500	25.000	5.761	144.025
1111	222.779,226.064,222.089,220.231	222.791	215.500	25.000	7.291	182.275
1112	226.064,225.399,221.596,222.089	223.787	215.500	25.000	8.287	207.175
1113	225.399,223.645,220.583,221.596	222.806	215.500	25.000	7.306	182.650
1114	223.645,222.076,220.598,220.583	221.725	215.500	25.000	6.225	155.625
1115	222.076,221.338,221.122,220.598	221.283	215.500	25.000	5.783	144.575
1116	221.338,221.425,222.443,221.122	221.582	215.500	25.000	6.082	152.050
1117	221.425,220.923,223.475,222.443	222.067	215.500	25.000	6.567	164.175
1118	220.923,221.632,223.93,223.475	222.490	215.500	25.000	6.990	174.750
1119	221.632,221.887,222.516,223.93	222.491	215.500	25.000	6.991	174.775
1120	221.887,221.882,223.06,222.516	222.336	215.500	25.000	6.836	170.900
1121	221.882,221.546,222.693,223.06	222.295	215.500	25.000	6.795	169.875
1122	221.546,221.425,222.302,222.693	221.992	215.500	25.000	6.492	162.300
1123	221.425,221.431,221.79,222.302	221.737	215.500	25.000	6.237	155.925
1124	221.431,221.285,222.346,221.79	221.713	215.500	25.000	6.213	155.325
1125	221.285,221.622,221.586,222.346	221.710	215.500	25.000	6.210	155.250
1126	221.622,222.47,222.254,221.586	221.983	215.500	25.000	6.483	162.075
1127	222.47,223.14,223.641,222.254	222.876	215.500	25.000	7.376	184.400
1128	223.14,220.501,223.983,223.641	222.817	215.500	25.000	7.317	182.925
1129	220.501,218.104,222.521,223.983	221.277	215.500	25.000	5.777	144.425
1130	218.104,217.463,217.537,217.537,220.945,222.521	219.018	215.500	16.201	3.518	56.995
1131	217.559,220.945,217.537,217.559	218.400	215.500	0.756	2.900	2.192
1132	218.232,219.74,218.736	218.902	215.500	12.500	3.402	42.525
1133	218.232,218.415,220.813,219.74	219.300	215.500	25.000	3.800	95.000
1134	218.415,219.15,221.191,220.813	219.892	215.500	25.000	4.392	109.800
1135	219.15,220.126,220.891,221.191	220.340	215.500	25.000	4.840	121.000
1136	220.126,221.399,221.901,220.891	221.079	215.500	25.000	5.579	139.475
1137	221.399,221.782,222.106,221.901	221.797	215.500	25.000	6.297	157.425
1138	221.782,221.765,222.185,222.106	221.959	215.500	25.000	6.459	161.475
1139	221.765,221.186,221.402,222.185	221.634	215.500	25.000	6.134	153.350
1140	221.186,221.974,222.779,221.402	221.835	215.500	25.000	6.335	158.375

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
1141	221.974,224.61,226.064,222.779	223.857	215.500	25.000	8.357	208.925
1142	224.61,225.602,225.399,226.064	225.419	215.500	25.000	9.919	247.975
1143	225.602,223.606,223.645,225.399	224.563	215.500	25.000	9.063	226.575
1144	223.606,222.381,222.076,223.645	222.927	215.500	25.000	7.427	185.675
1145	222.381,221.563,221.338,222.076	221.839	215.500	25.000	6.339	158.475
1146	221.563,220.937,221.425,221.338	221.316	215.500	25.000	5.816	145.400
1147	220.937,220.931,220.923,221.425	221.054	215.500	25.000	5.554	138.850
1148	220.931,221.208,221.632,220.923	221.174	215.500	25.000	5.674	141.850
1149	221.208,221.209,221.887,221.632	221.484	215.500	25.000	5.984	149.600
1150	221.209,220.763,221.882,221.887	221.435	215.500	25.000	5.935	148.375
1151	220.763,220.881,221.546,221.882	221.268	215.500	25.000	5.768	144.200
1152	220.881,221.308,221.425,221.546	221.290	215.500	25.000	5.790	144.750
1153	221.308,221.555,221.431,221.425	221.430	215.500	25.000	5.930	148.250
1154	221.555,221.825,221.285,221.431	221.524	215.500	25.000	6.024	150.600
1155	221.825,220.468,221.622,221.285	221.300	215.500	25.000	5.800	145.000
1156	220.468,220.757,222.47,221.622	221.329	215.500	25.000	5.829	145.725
1157	220.757,220.546,223.14,222.47	221.728	215.500	25.000	6.228	155.700
1158	220.546,217.343,217.356,217.356,220.501,223.14	219.374	215.500	24.824	3.874	96.168
1159	217.456,218.104,220.501,217.356,217.448,217.456	218.054	215.500	12.155	2.554	31.044
1160	217.463,218.104,217.456,217.463	217.622	215.500	0.086	2.122	0.182
1161	217.315,219.15,218.415	218.293	215.500	12.500	2.793	34.913
1162	217.315,218.419,220.126,219.15	218.753	215.500	25.000	3.253	81.325
1163	218.419,219.277,221.399,220.126	219.805	215.500	25.000	4.305	107.625
1164	219.277,220.323,221.782,221.399	220.695	215.500	25.000	5.195	129.875
1165	220.323,220.504,221.765,221.782	221.093	215.500	25.000	5.593	139.825
1166	220.504,219.849,221.186,221.765	220.826	215.500	25.000	5.326	133.150
1167	219.849,221.476,221.974,221.186	221.121	215.500	25.000	5.621	140.525
1168	221.476,223.122,224.61,221.974	222.796	215.500	25.000	7.296	182.400
1169	223.122,221.988,225.602,224.61	223.831	215.500	25.000	8.331	208.275
1170	221.988,221.162,223.606,225.602	223.090	215.500	25.000	7.590	189.750
1171	221.162,221.294,222.381,223.606	222.111	215.500	25.000	6.611	165.275

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
1172	221.294,222.015,221.563,222.381	221.813	215.500	25.000	6.313	157.825
1173	222.015,221.392,220.937,221.563	221.477	215.500	25.000	5.977	149.425
1174	221.392,220.964,220.931,220.937	221.056	215.500	25.000	5.556	138.900
1175	220.964,221.898,221.208,220.931	221.250	215.500	25.000	5.750	143.750
1176	221.898,222.615,221.209,221.208	221.732	215.500	25.000	6.232	155.800
1177	222.615,222.418,220.763,221.209	221.751	215.500	25.000	6.251	156.275
1178	222.418,222.409,220.881,220.763	221.618	215.500	25.000	6.118	152.950
1179	222.409,222.284,221.308,220.881	221.721	215.500	25.000	6.221	155.525
1180	222.284,222.242,221.555,221.308	221.847	215.500	25.000	6.347	158.675
1181	222.242,222.316,221.825,221.555	221.985	215.500	25.000	6.485	162.125
1182	222.316,221.119,220.468,221.825	221.432	215.500	25.000	5.932	148.300
1183	221.119,219.402,220.757,220.468	220.436	215.500	25.000	4.936	123.400
1184	219.402,217.217,217.254,217.254,220.546,220.757	218.738	215.500	23.670	3.238	76.643
1185	217.343,220.546,217.254,217.343	218.121	215.500	7.661	2.621	20.079
1186	216.995,218.419,217.315,217.307,217.005,216.995	217.340	215.500	6.311	1.840	11.612
1187	217.086,219.277,218.419,216.995,217.086	217.773	215.500	16.293	2.273	37.034
1188	217.061,218.48,220.323,219.277,217.086,217.061	218.214	215.500	24.207	2.714	65.698
1189	218.48,218.719,220.504,220.323	219.506	215.500	25.000	4.006	100.150
1190	218.719,218.279,219.849,220.504	219.338	215.500	25.000	3.838	95.950
1191	218.279,219.996,221.476,219.849	219.900	215.500	25.000	4.400	110.000
1192	219.996,219.514,223.122,221.476	221.027	215.500	25.000	5.527	138.175
1193	219.514,220.504,221.988,223.122	221.282	215.500	25.000	5.782	144.550
1194	220.504,220.226,221.162,221.988	220.970	215.500	25.000	5.470	136.750
1195	220.226,219.847,221.294,221.162	220.632	215.500	25.000	5.132	128.300
1196	219.847,220.793,222.015,221.294	220.987	215.500	25.000	5.487	137.175
1197	220.793,222.297,221.392,222.015	221.624	215.500	25.000	6.124	153.100
1198	222.297,221.882,220.964,221.392	221.634	215.500	25.000	6.134	153.350
1199	221.882,222.386,221.898,220.964	221.783	215.500	25.000	6.283	157.075
1200	222.386,221.51,222.615,221.898	222.102	215.500	25.000	6.602	165.050
1201	221.51,222.588,222.418,222.615	222.282	215.500	25.000	6.782	169.550
1202	222.588,223.644,222.409,222.418	222.765	215.500	25.000	7.265	181.625

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
1203	223.644,223.156,222.284,222.409	222.874	215.500	25.000	7.374	184.350
1204	223.156,222.052,222.242,222.284	222.434	215.500	25.000	6.934	173.350
1205	222.052,220.714,222.316,222.242	221.831	215.500	25.000	6.331	158.275
1206	220.714,218.684,221.119,222.316	220.708	215.500	25.000	5.208	130.200
1207	218.684,217.253,217.144,217.152,217.152,219.402,221.119	218.272	215.500	21.011	2.772	58.242
1208	217.217,219.402,217.152,217.217	217.747	215.500	4.140	2.247	9.303
1209	217.023,218.48,217.061,217.023	217.397	215.500	1.694	1.897	3.214
1210	216.961,218.719,218.48,217.023,216.961	217.629	215.500	10.510	2.129	22.376
1211	216.817,216.818,216.961,218.279,218.719,216.961	217.426	215.500	7.696	1.926	14.822
1212	216.817,216.825,216.818,217.779,219.996,218.279,216.818	217.619	215.500	24.962	2.119	52.894
1213	217.779,218.74,219.514,219.996	219.007	215.500	25.000	3.507	87.675
1214	218.74,220.355,220.504,219.514	219.778	215.500	25.000	4.278	106.950
1215	220.355,219.708,220.226,220.504	220.198	215.500	25.000	4.698	117.450
1216	219.708,220.261,219.847,220.226	220.011	215.500	25.000	4.511	112.775
1217	220.261,220.033,220.793,219.847	220.234	215.500	25.000	4.734	118.350
1218	220.033,220.725,222.297,220.793	220.962	215.500	25.000	5.462	136.550
1219	220.725,221.458,221.882,222.297	221.591	215.500	25.000	6.091	152.275
1220	221.458,220.3,222.386,221.882	221.507	215.500	25.000	6.007	150.175
1221	220.3,220.489,221.51,222.386	221.171	215.500	25.000	5.671	141.775
1222	220.489,221.465,222.588,221.51	221.513	215.500	25.000	6.013	150.325
1223	221.465,222.72,223.644,222.588	222.604	215.500	25.000	7.104	177.600
1224	222.72,222.216,223.156,223.644	222.934	215.500	25.000	7.434	185.850
1225	222.216,220.18,222.052,223.156	221.901	215.500	25.000	6.401	160.025
1226	220.18,217.514,217.495,217.495,220.714,222.052	219.242	215.500	24.908	3.742	93.206
1227	217.312,218.684,220.714,217.495,217.312	218.304	215.500	14.451	2.804	40.521
1228	217.253,218.684,217.312,217.253	217.626	215.500	0.928	2.126	1.973
1229	217.779,216.825,216.817	217.140	215.500	0.000	1.640	0.000
1230	218.986,219.708,220.355	219.683	215.500	12.500	4.183	52.287
1231	218.986,219.265,220.261,219.708	219.555	215.500	25.000	4.055	101.375

Box No.	Ground Elevations	Average Ground	Average Formation	Formation Box Area	Cutting Depth	Volume
1232	219.265,219.565,220.033,220.261	219.781	215.500	25.000	4.281	107.025
1233	219.565,220.087,220.725,220.033	220.103	215.500	25.000	4.603	115.075
1234	220.087,220.12,221.458,220.725	220.598	215.500	25.000	5.098	127.450
1235	220.12,220.657,220.3,221.458	220.634	215.500	25.000	5.134	128.350
1236	220.657,220.619,220.489,220.3	220.516	215.500	25.000	5.016	125.400
1237	220.619,220.876,221.465,220.489	220.862	215.500	25.000	5.362	134.050
1238	220.876,221.187,222.72,221.465	221.562	215.500	25.000	6.062	151.550
1239	221.187,219.855,222.216,222.72	221.495	215.500	25.000	5.995	149.875
1240	219.855,217.776,217.678,217.678,220.18,222.216	219.231	215.500	22.532	3.731	84.067
1241	217.514,220.18,217.678,217.514	218.222	215.500	7.047	2.722	19.182
1242	219.194,220.087,219.565	219.615	215.500	12.500	4.115	51.438
1243	219.194,219.968,220.12,220.087	219.842	215.500	25.000	4.342	108.550
1244	219.968,220.615,220.657,220.12	220.340	215.500	25.000	4.840	121.000
1245	220.615,220.431,220.619,220.657	220.581	215.500	25.000	5.081	127.025
1246	220.431,220.249,220.876,220.619	220.544	215.500	25.000	5.044	126.100
1247	220.249,219.851,221.187,220.876	220.541	215.500	25.000	5.041	126.025
1248	219.851,218.972,219.855,221.187	219.967	215.500	18.051	4.467	80.634
1249	217.776,219.855,218.972,217.78,217.776	218.432	215.500	2.569	2.932	7.532
						272213.666

5 Selection of Technology

5.1 Clearing vs. Capping of Legacy Waste

The SWM Rules 2016 clearly mandate clearing of sites as a first option, by bio-mining and bioremediation. Still, capping is often proposed or considered an option in India merely because it is done in the West. But clearing a dumpsite almost to ground level rather than capping it is a far better option for permanent pollution prevention, as well as for the following additional reasons:

Clearing by bio-mining recovers the entire base area of a dump at almost ground level. Capping gives only one-third of the base area as usable area at an inconvenient height for future use.

Cleared sites require no after-care. Capping requires at least 15 years of continuous leachate pump-out and treatment in a dedicated effluent treatment plant nearby. Gas extraction is very difficult and inefficient when attempts are made to insert suction pipes into dumped waste instead of before dumping begins. Poor success at Gorai capping led to the forced refund by Mumbai city of Rs 15 crore advance carbon credits.

Capping of open dumps (wrongly called SLFs or Sanitary Landfills) requires intake of fresh waste to be stopped and permanently diverted to a fresh site before capping begins. With increasing protests against fresh waste disposal sites, getting started elsewhere can often delay capping plans indefinitely. Bioremediation and Bio-mining to clear a site can start immediately at one part of an actively used dump while fresh waste continues to be received and stabilized at another part. Clearing can be done in phases to match available funds.

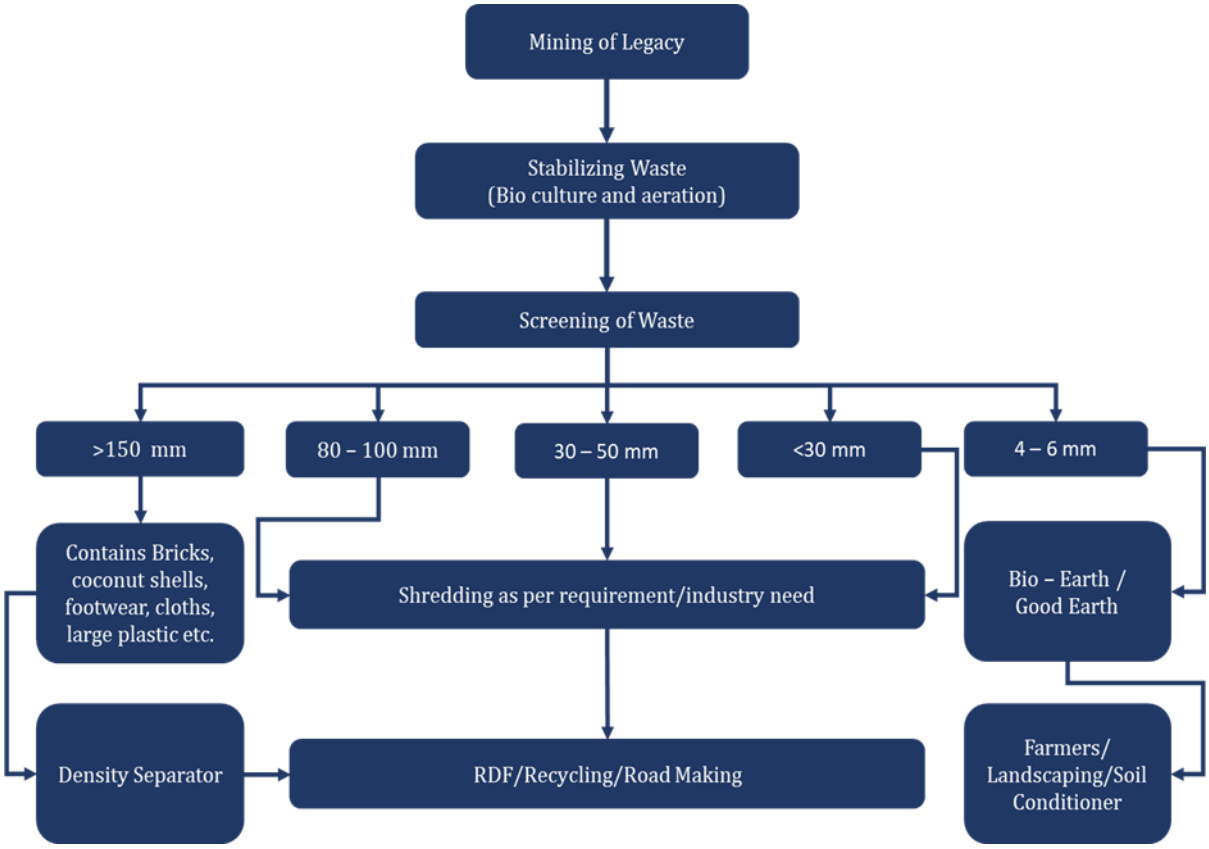
In the USA, only grass is permitted to be grown on the soil cover of a capped site. It must be regularly mowed for 15 years to prevent the growth of herbs or shrubs or trees whose roots may penetrate the plastic layer below the soil cover. If trees are planted over soil capping, they die in a few years as soon as their roots enter the hot airless waste below. Capped sites are closed to the public for 15 years. But if a dump is cleared to near ground level, it can be easily converted to a public tree park or garden if desired, unless below-ground waste remains untreated on the site

Thus, capping of dumpsites is not advisable and bioremediation and biomining of the legacy waste has been selected as the preferred option for legacy waste management of these two sites.

5.2 Bioremediation and Biomining of Old Municipal Dumpsites

It refers to the excavation of old dumped waste and make windrow of legacy waste thereafter stabilization of the waste through bio-remediation i.e. exposure of all the waste to air along with use of composting bio-cultures, i.e. screening of the stabilized waste to recover all valuable resources (like organic fines, bricks, stones, plastics, metals, clothes,

rags etc.) followed by its sustainable management through recycling, co-processing, road making etc.



The first step is to excavate legacy waste, loosen it and make windrows so as the leachate can be dried of through solar exposure and all the entrapped methane is removed from the heap. All biodegradable waste, like discarded food, fruit, flower and garden waste, needs air to decompose it in an odourless way without producing leachate. So the first step in stabilizing and bringing down airless legacy waste is to expose as much of it as possible to air.

Addition of composting bio-cultures speeds up decomposition and rapidly creates biological heat within the waste that helps to dry it out and reduce its volume by 35-40%. This happens through loss of moisture and by decomposition of some of the aerated waste to carbon dioxide and water vapour. This is called bioremediation and makes the waste dry enough for screening. Waste is called stabilized when there is no more generation of heat or landfill gas or leachate, and seeds are able to germinate in it.

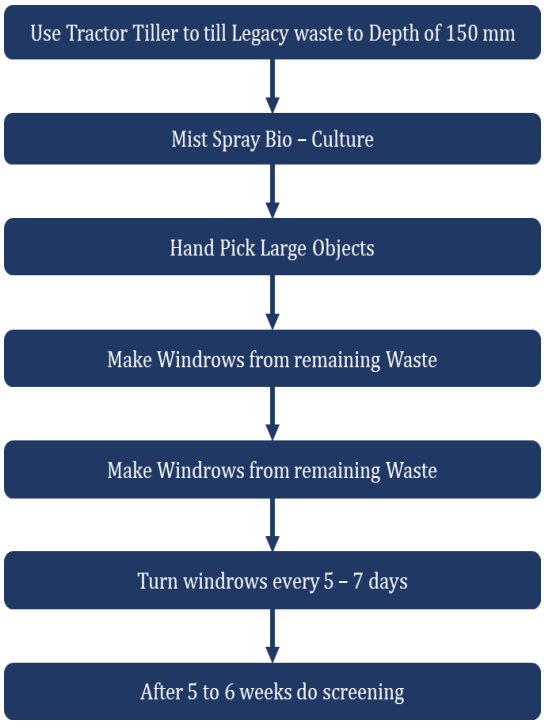
It means the screening of such stabilized waste into different size fractions that can be usefully used off-site or disposed of without affecting the environment. Screen sizes commonly used are one or more of the following: 150 mm. 80 to 100 mm, 24 to 50mm, 12- 16 mm and 4-6. The finest fraction is called bio-earth or good earth. It contains a mixture of humus-rich organics which improve soil fertility along with a high proportion of soil or sand, which is why it cannot meet FCO standards for compost. The coarsest fraction contains bricks, stones, coconut shells, footwear, cloth and larger plastics.

Density separation helps recover combustibles which can be used (usually up to 5-10%) as fuel replacement after supplying it to customer requirements. The lighter mid-fractions are mostly plastics and can be shredded as per industry requirement for use in bitumen hot mix plants to make so called Plastic Roads or as refuse derived fuel for co-processing in cement kilns. Fractions up to 50mm do not require shredding for use as RDF. The heavier mid-fractions are mostly stony inert which can be used in the lowest layers of roadmaking or plinth-filling or in low-lying areas but should not contain more than 3-5% plastics by weight. Less than 10% of the original waste remains as totally unusable residual rejects and may remain onsite, either in a small heap or spread to raise the ground level by a couple of meters. The land which was hosting waste dumps is now fully recovered for alternate uses. Biomining and Bio-remediation processes should be adopted as early as possible to ensure holistic solid waste management

5.3 Process of Bioremediation and Biomining

Exposing the legacy waste to air to stabilize it has been done since 1998 in many ways. Almost all of them involve forming the waste into long low heaps of about 2-meter height called windrows, to get maximum surface area to volume. Repeated turning is necessary to ensure that the innermost waste in windrows also gets exposed to air. Usually 3-4 turnings of legacy waste are necessary to stabilize it.

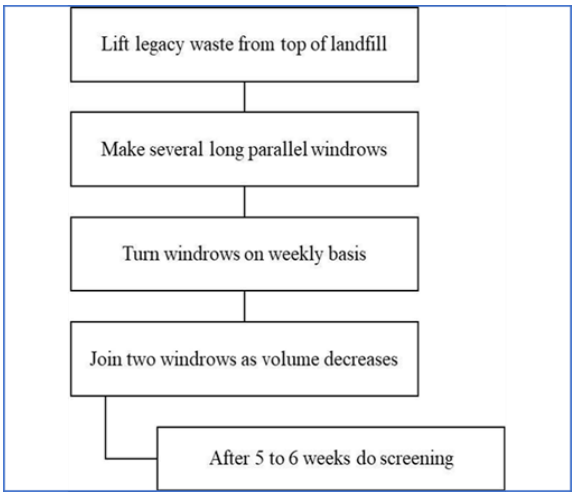
1. Use a tractor-tiller to repeatedly loosen the topmost 150 mm layer of legacy waste. Mist- spray the waste lightly with bio-cultures to control odour and get the decomposing microbes dispersed into the waste. Hand-pick out large objects like rocks or coconut-shells or long pieces of cloth. Form the waste into windrows using a Bobcat or JCB or similar earth- moving equipment. Turn these windrows every 5 days. After 2-3 weeks when the heaps are free flowing enough for screening, move the material to multi-deck vibrating screens or to trommels (rotating cylinders with different size perforations) to get fractions of different size and weight.



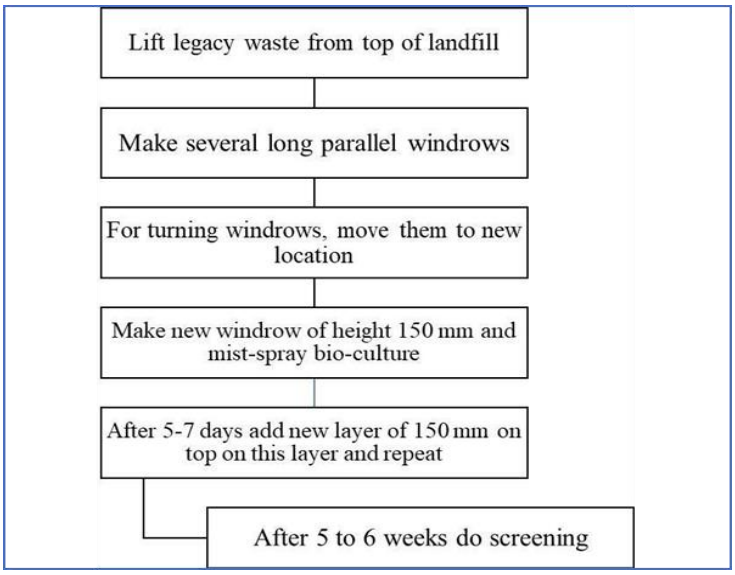
2. Use a JCB to dig 2-2.5 meters deep trenches downwards from the top of a legacy waste heap at 1.5to2 meters intervals. This is a rapid and cost-effective way to slice the uppermost layer into in-situ windrows. Mist-spray the sides of the trenches to get microbes to reach exposed waste surfaces. Bring down these slices to form terraces and turn one aerated windrow onto another weekly before repeating the process until almost ground level is reached. Start screening when waste moisture is low enough

3. Use a JCB to lift legacy waste off the top of a heap and drop it from a height to aerate and loosen the waste and form 2-3 meters high cones. Mist-spray bio culture on the cones. Every day or 2-3 days use the JCB to lift waste from the cones and drop it back to the same or a nearby location, to aerate the waste. This is rather fuel intensive.

4. Where space permits, move the waste to form several long parallel windrows. Turn these weekly with a JCB. Often at the second or third turning, one heap can be combined with a second one as their volumes decrease. Windrows can be aerated either by moving all the waste to form a new parallel windrow, with the innermost waste on the outside for aeration, or by moving all the waste forward in small steps while dropping it from a height for aeration.



5. If waste needs to be moved from one location to another part of the same site, usually the perimeter, place it in thin 150 mm layers and mist-spray bio cultures. Allow 5 days to aerate one layer before adding the next one and mist-spraying bio cultures on that also. Turning may not be necessary when waste is spread thin like this, to decompose like leaves on a forest floor.



6. This is a constantly evolving field. Hence other cost effective and space effective methods can also be applied.

5.4 Processing Equipment's for Processing of Legacy Waste

The major equipment that would come in use would fall under the following heads of processes like excavation, shredding, screening, air classification and ferrous separation. As per suitability and requirement the appropriate choices should be made.

1. Screening
   - Trommel
   - Vibrating Screen
   - Disc/ Star
2. Handling Equipment
   - Loader (Front Load)
   - Conveyers
   - Fork-Lifts
3. Screening
   - Trommel
   - Vibrating Screen
   - Disc/ Star
4. Handling Equipment
   - Loader (Front Load)
   - Conveyers
   - Fork-Lifts

6 Treatment Process

Processing of accumulated waste shall be done in following manner as given below:

1. Local Body (LB) shall make a time bound plan to execute the bio-mining process to clear the old waste.
2. Volume of waste to be determined through contour survey (Total Station Survey) and site measurements. Drone mapping of heap volumes at different stages is most cost-effective and fast. Weighment of heaps is difficult and problematic as payment would be collected for heavy fractions, leaving behind the more pollution-prone lighter fractions.
3. Initial Contour level survey of the site shall be done on start of work and Final Contour level survey shall be done on final completion of the work.
4. Do an initial baseline survey of surface and subsurface soils and waters and also leachate present, to check for heavy metals and toxics if any. Samples should be drawn by an NABL or MOEF certified lab, also at the final stage. During operations, the operator should collect and keep daily samples of the finest fractions, to be pooled and analyzed monthly or at random by an NABL lab. This is to ensure that unsterilized rotted waste is not simply moved from one location to another by mining without bioremediation.
5. Sprinkle the newly exposed surfaces with a composting bio culture solution or a dilute solution of 5% fresh cow dung in water. This will control smell and speed up decomposition. With the help of Backhoe loader, the waste in the demarcated area should be loosened up.
6. Usually, the top layer has several materials in the active biological state. This layer shall be stabilized through composting bio-cultures, as well as herbal/biological sanitizers if found necessary for odour control.

7. Raking of garbage layers by a long spike harrow operating in cross directions may be done as needed to pull out large rags, plastic, rubber, textiles etc.
8. Waste pickers or labour should manually pick out bulky waste like coconut shells, banana stems, tyres and rocks prior to screening for bio-mining. Store in separate heaps for sale or use.
9. Turn these windrow heaps once a week until no more volume reduction is observed in the heaps and no more heat is generated. If the garbage is stabilized, there will be no smell or leachate formation and the material will be dry enough for sieving.
10. ULB or its agency may deploy Trommels and/or Horizontal Screens or other types of screens for the purpose of screening. Screen the stabilized waste in a rotary screen or gravity screens of different size openings, preferably 35mm and 8mm. A fan can blow out the plastic fraction for use by recyclers. Compost
11. Appropriate numbers of excavators, backhoe loaders and workers will be required to execute the work.
12. The recyclables recovered from the bio-mining process should be sent for recycling as per the quality of the material, which should also be randomly sampled by an NABL lab and tested for heavy metals, salinity/electrical conductivity and leachability to ensure no environmental harm during use. FCO standards for pH and contaminants could be provisionally used as a benchmark. Non-Recyclable plastic material shall be sent for road making or to RDF units or cement plants. Initial cleaning of recyclable waste shall be done before it is transported for sale or disposal.
13. The recovered earthy fines shall preferably be used for landscaping or gardening or road medians within the Local Body or the site. The recovered soil can also be used as "Soil enricher" to develop green areas or by farmers.
14. The recyclables like plastic, glass, metals, rags and cloth recovered from the waste during screening shall be sorted out and preferably cleaned before sending to recycling industries or as RDF.
15. The heavy fractions may be sand and gravel usable for road shoulders or for plinth filling. Stones and concrete if any can be used for road sub-grade, or for crushing. Recycling and reuse in the construction industry. The recovered construction and demolition waste recovered from the bio-mining process may be sent to a C&D processing facility if suitable for production of building materials.
16. In very old garbage layers with high debris content, most of the organic matter may have already been decomposed. Do a seed germination test to ensure it is stabilized. Add bio-cultures to fully stabilize it if heat is still generated in windrow heaps or volume reduction is observed. After 7-10 days of stabilization the waste can be taken up for screening.
17. Usually, the finest fraction will be organic matter plus fine soil, called 'bio-earth', which can be used as soil improver, especially for restoring alkaline or saline soils to fertility, or to grow some vegetation for erosion control. It is also useful as a lawn subgrade cum drainage layer, or it can be used as organic manure in tree pits.

The next coarser fraction will be gravel and coarse organics, which can be used for road and railway embankments the coarsest fraction may have a lot of combustibles (cloth etc.) which can be baled and supplied as Alternate Fuel Resources in cement kilns or boilers.

18. There may be some (maximum 5-10% of total) left over waste including lumps of heterogeneous nature. The waste may be soaked with leachate or hard and difficult to disintegrate. This waste can be sent to scientific landfill for disposal (near zero residues).
19. The recovered land from the bio-mining process shall be utilized for any purpose deemed appropriate. Ideally reclaimed space should be reused for waste processing, otherwise for alternate non-habitation uses.

6.1 Proposed Design Parameters for Biomining Process

Table 6-1 Analysis of Bio-mining & Screening of Waste Dumped

Analysis of Bio-mining & Screening of Waste Dumped for Bio-remediation & Bio-mining of Legacy Waste at Ghaziabad			
Sl No	**Particulars**	**Qty**	**Unit**
1	**Quantity of Waste Dumped at Site**	**272213.7**	**Cum**
2	**Quantity of Waste Dumped at Site**	**272214**	**MT**
3	**Capacity of each unit**	**50**	**MT/Hr**
4	**No. of units proposed**	**2**	**Nos**
5	**Total Capacity of segregation unit**	**100**	**Mt/Hr**
6	**No of 8 Hrs shifts per day**	**2**	
7	**Working Hrs per shift**	**7.5**	**Hrs**
8	**Working Hours in a Day**	**15**	**Hrs**
9	**Waste Segregation capacity per day**	**1500**	**Mt**
10	**No of Days for Project completion**	**181**	**Days**
11	**Add 10 % for unforeseen hinderance**	**18**	**Days**
12	**Add 30 Days for windrow formation before starting segregation**	**30**	**Days**
13	**Total Days for project**	**229**	**Days**
14	**Total man months @ 26 Days /month**	**8.81**	**Months**
	Say	**8.9**	**Months**
15	**Capital cost of segregation Machineries**	**52060000**	**Rs**
16	**Capital Cost civil work**	**8510000**	**Rs**

6.2 Cost Assessment

Table 6-2 Abstract of Cost for Bio– remediation & Bio-mining of Legacy Waste

Abstract of Cost for Bio-remediation & Bio-mining of Legacy Waste at Ghaziabad		
S. No	**Particulars of Cost Head**	**Cost (Rs)**
1	Leasing Charge of Segregation & Material Recovery Unit	15444466.67
2	Manpower Cost for Segregation & Material Recovery Unit	4919133
3	Power Cost for Segregation & Material Recovery Unit	4951913
4	Spare & Maintenance cost of Segregation & Material Recovery Unit	3861117
5	Hiring Charge of Earth moving & other Equipment	40749176
6	Cost of Bio-culture	6124807
7	Cost of Inert Transportation	2120003
8	Cost of RDF Transportation upto Lead 250 Kms	28190482
9	Cost of Civil Work (Non-reutilisable part of Capital Cost)	8510000
10	Miscellaneous Cost	756500
11	**Project Cost without Profit without Intrest (X)**	**115627598**
12	Add Profit @ 10% of 'X' (b)	11562760
13	Add Environment Management Charge @ 1% of 'X' ©	1156276
14	Add water Charge @ 1% of 'X' (d)	1156276
15	Add Labour Cess @ 1% of 'X' (e)	1156276
16	Add Contingencies @ 1% of 'X' (f)	1156276
17	Add Project Monitoring & Supervision cost @ 2% of 'X' (g)	2312552
18	**Total Project Cost with RDF Transportation (Y)=X+a+b+c+d+e+g**	**134128013**

19	**Cost for Bio-remediation & Bio-mining without RDF Transportation**	**105937531**
20	Legacy Waste deposited at site (MT)	272214.00
21	**Per MT charges for Bio-remediation & Bio-mining with RDF Transportation (Rs)**	**492.7**
22	**Per MT charges for Bio-remediation & Bio-mining without RDF Transportation (Rs)**	**389.2**

6.3 Capital Cost Estimation for Biomining of Ghaziabad Dumpsite

Table 6-3 Capital Expenditure

Sr.	Parameters	Units	Nos required	Rate	Total Costs in Lakhs
A	**Cost of segregation Machineries**				
1	Machineries- 1 set				
1.1	*Belt Conveyors (Roller Belts) along with supporting structure along with cabe tray and electrical panels*				
1.1.1	*Feeding Conveyor for Trommals (12.0 M long, 1.2 M wide))*	Nos	*2*	960000	*19.2*
1.1.2	*Discharge Conveyor for Trommals (10.0 M long, 1.0 M wide)*	Nos	*2*	750000	*15*
1.1.3	*Discharge Conveyor for Trommals (8.0 M long, 1.0 M wide)*	Nos	*4*	600000	*24*
1.1.4	*Feeding Conveyor for VADS (15.0 M long, 1.0 M wide))*	Nos	*1*	1050000	*10.5*
1.1.5	*Discharge Conveyor for VADS (7.0 M long, 0.8 M wide)*	Nos	*1*	490000	*4.9*
1.1.6	*Feeding Conveyor for Destoner (9.0 M long, 1.0 M wide))*	Nos	*1*	630000	*6.3*
1.1.7	*Discharge Conveyor for Destoner (7.0 M long, 0.8 M wide)*	Nos	*1*	490000	*4.9*
1.2	*Trommel Screen with Anti Clogging device*				
1.2.1	*Trommel Screen with 120 mm & 80 mm Hole , size 9.0 m LongX2.0 m dia*	Nos	*1*	2500000	*25*
1.2.2	*Trommel Screen with 35 mm & 16 mm Hole , size 9.0 m Long X 1.5 m dia*	Nos	*1*	2200000	*22*
1.3	*Volumetric Air Density Separators with Cyclone (10 TPH)*	Nos	*2*	*22,50,000*	*45*
1.4	*Destoner (10 TPH)*	Nos	*2*	*16,50,000*	*33*
1.5	*Magnetic Separator*	Nos	*2*	*5,50,000*	*11*
1.6	*Offline Shredder (10 TPH)*		*1*	*22,00,000*	*22*
2	*PLC & SCADA System*	*1 Set*	1	*1000000*	*10*
3	Main Panel	Nos	1	4,50,000.0	*4.5*
4	Cables	LS	1	3,00,000.0	*3*
	Total Cost of 1 Set of segregation Machines				*260.3*
	Total set of machineries required				*2*
	Total Cost of 2 set of Segregation Machineries				***520.6***
B	**Cost of Civil Work**				**85.1**

	Total				**605.7**

The Estimated capital Cost for machineries is **520.6 Lacs** whereas estimated capital cost for civil work is **85.1 Lacs**. Total capital investment for Project is **605.7 Lakhs**. While calculating the Lease charges for Segregation and Material recovery machines, it has been assumed that at the end of project, value of machineries will be 50%.

Table 6-4 Leasing Charges

A	**Leasing Charges of Material Recovery Unit**			
S. No	**Particulars**	**Capital Cost - Machineries**	**Leasing Factor**	**Lease Cost**
1	Lease Charge of Material Recovery and Segregation Unit considering 100% depreciation in 30 working months i.e for 8.9 months 8.9/30 percent	52060000	30%	15444466.67

6.4 Operational Cost Assessment for Biomining of Ghaziabad Site

6.5 Component 1: Manpower

Table 6-5 Manpower Cost

B	Manpower cost for Segregation & Material Recovery Unit						
S. No	**Particulars**	**Type**	**Basis of Calculation**	**Manpower Required**	**Cost / Month (Rs)**	**Total Man-Months**	**Total Manpower Cost (Rs)**
1	Labours	Unskilled	4 Nos per Line per shift	16	9074	8.9	1292138
2	Mechanical Maintenance Operators	Skilled	1 Nos per shift	2	11180	8.9	199004
3	Electrical Maintenance Operators	Skilled	1 Nos per shift	2	11180	8.9	199004
4	Supervisor Maintenance Operators	Skilled	1 Nos per Line per shift	4	11180	8.9	398008
5	Weigh Bridge Operators	Semi-skilled	1 No per shift	2	9984	8.9	177715
6	Accountants	Skilled	1 No	1	11180	8.9	99502
7	Security Guards	Semi-skilled	1 Nos per shift of 8 Hrs	3	9984	8.9	266573
8	Environmental Engineer	Highly Skilled	1 No	1	52000	8.9	462800
9	Head Operations/Plant Head	Highly Skilled	1 No	1	78000	8.9	694200
10	Control Room Operator	Skilled	1 No per shift	2	11180	8.9	199004
	Total Manpower cost					**Rs**	3987948
	ESI 4.75% & PF 13.60%					**Rs**	7,31,788
	Add Overhead @ 5%						1,99,397
	Grand Total for Labour				**B =**	**Rs**	**49,19,133**

6.5.1 Component 2: Electricity

Table 6-6 Electricity

C	Electricity for Segregation & Material Recovery Unit					
Sl No	**Particulars**	**Connected Load (KW)**	**working Hrs**	**unit consumed (KW-Hrs)**	**Rate**	**Total Cost (Electricity)**
1	*120 mm & 80 mm trommal with 1 No Feeding and 3 nos Discharge conveyor*	37.50	2722.14	102080.25	7.00	7,14,561.75
2	*35 mm & 16 mm trommal with 1 No Feeding and 2 Nos Discharge conveyor*	37.50	2722.14	102080.25	7.00	7,14,561.75
3	*2 Nos Volumetric Air Density Separator with feeding, Discharge conveyors*	96.00	2722.14	261325.44	7.00	18,29,278.08
4	*Destoner with feeding conveyor & Discharge Conveyor*	55.50	2722.14	151078.77	7.00	10,57,551.39
5	*Magnetic Separator*	9.00	2722.14	24499.26	7.00	1,71,494.82
6	*Offline Shredder Unit with Conveyors*	49.50	2722.14	134745.93	7.00	9,43,221.51
				Total for Electricity =		**47,16,107.55**
				Add: Overhead @ 5%		**235805.38**
				A=	**Total**	**49,51,912.93**

Table 6-7 Total Load of segregation and Material Recovery Unit

Total Load of segregation and Material Recovery Unit						
Sl No	**Particulars**	**Set**	**Nos per set**	**Connected Load (HP)**	**Total Connected Load (HP)**	**Total Connected Load (KW)**
1	*120 mm & 80 mm trommal with Feeding and Discharge conveyor*	2.00	1	25.00	50.00	37.5
2	*35 mm & 16 mm trommal with Feeding and Discharge conveyor*	2.00	1	25.00	50.00	37.5
3	*Volumetric Air Density Separator with feeding, Discharge conveyors*	2.00	2	32.00	128.00	96
4	*Destoner with feeding & Discharge conveyor*	2.00	2	18.50	74.00	55.5
5	*Magnetic Separator*	2.00	2	3.00	12.00	9
6	*Offline Shredder Unit with Conveyors*	2.00	1	33.00	66.00	49.5

6.5.2 Component 3: Maintenance

Table 6-8 Spare & Maintenance cost of Segregation & Material Recovery Unit

D	Spare & Maintenance cost of Segregation & Material Recovery Unit			
S. No	**Particulars**	**Capital Cost - Machineries**	**Factor**	**Cost (Rs)**
1	Spare Parts & Maintenance cost @ 10% of Cost Machineries per annum i.e. for 8.9 months (8.9/12) *10%	52060000	7.4%	3861116.667

6.5.3 Component 4: Machinery

Table 6-9 Hiring Charge of Earth moving & other Equipment

E	Hiring Charge of Earth moving & other Equipment					
S. No	**Description**	**No Required**	**Rental Cost per Shift of 8 Hrs (in INR)**	**Total shifts of 8 Hrs /machine**	**Total Cost**	**Reference**
1	Hydraulic Excavator (3D) with driver and fuel :Proposed for Pre-stabilization (primary excavation the garbage and forming windrows of the same before sprinkling of bio culture and Deodouriser) & loading and transferring the waste to the plant area from dumpsite	4	7000	458	12824000	DSR rates: Code 0020: Basic Rates Earth Work
2	Front End Loader (JCB): Proposed for feeding the waste into processing lines	4	6000	458	10992000	DSR rates: Code 0014: Basic Rates Hire Charges of Plant and Machinery

3	Front End Loader (JCB): Proposed for aggregate shifting and soil disposal area levelling	1	6000	458	2748000	DSR rates: Code 0052: Basic Rates Hire Charges of Plant and Machinery
4	Water Tanker: Bio-culture spray	2	1200	458	1099200	DSR rates: Code 0046: Basic Rates Hire Charges of Plant and Machinery
5	TRACTOR TRAILER: Proposed for internal movement of aggregates and dust management. Five (5) Trips per Hour with 2 MT/Trip capacity.	10	1200	458	5496000	DSR rates: Code 0039: Basic Rates Hire Charges of Plant and Machinery
6	Generator 250 KVA	1	3000	458	1374000	DSR rates: Code 0030: Basic Rates HireCharges of Plant and Machinery
	Total Cost of Hiring machineries			**Rs**	**34533200**	
	Add GST 18%			**Rs**	**62,15,976**	
	Grand Total for Hiring			**Rs**	**4,07,49,176**	

6.5.4 Component 5: Bio-culture

Table 6-10 Cost of Bio-culture

F	**Cost Of Bio-culture**					
S.No	**Particulars**	**Unit**	**Quantity (Ltr)**	**Rate (Rs./Ltr)**	**Amount (Rs)**	**Remark & Justification**
1	Bio-culture administration	Kg	204160.2	30	6124807	0.5 kg needs to be added for 1 m3/MT of MSW, diluted in water. To be administered 1.5 times at-least. (Annexure 2- Inclusive of GST)

6.5.5 Component 6: Residual Inert Transportation

Table 6-11 Cost of Residual Inert Transportation

G	**Cost Of Residual Inert Transportation**			
S. No	**Particular**		**Unit**	Remark
1	Total Waste Processed	272214	MT	
2	% Residual Inert	20%		
3	Total Inert	54442.8	MT	
6	Maximum Loading capacity of Truck	10	MT	
7	Transportation cost per Km per MT for 10 MT Truck	3.3	Rs	DSR rates: Code 0071: Basic Rates Hire Charges of Plant and Machinery
9	Trip Distance (KMS)	10	KMs	
10	Per Ton Cost of Inert Transportation	33	Rs	
11	Add 18% GST	5.94	Rs	
12	Gross Per MT Cost For Inert Transportation	38.94	Rs	
15	Total Cost For RDF Transportation	2120002.63	Rs	

6.5.6 Component7: RDF Transportation Costs

Table 6-12 Cost of RDF Transportation

H	Cost Of RDF Transportation			
S. No	**Particular**		**Unit**	
1	Total Waste Processed	272214	MT	
2	RDF Generation	20%		
3	Total RDF Generation (MT)	54442.8	MT	
4	Volume of Truck	24.14	Cum	
5	Density of RDF	0.4	MT/Cum	
6	Maximum Loading 0f RDF in 10 MT Truck	9.66	MT	
7	Transportation cost per Km per MT for 10 MT Truck	3.3	Rs	DSR rates: Code 0071: Basic Rates Hire Charges of Plant and Machinery
8	Transportation Cost of RDF Per Km Per MT	3.42	Rs	
9	Trip Distance (KMS)	500	KMs	
10	Per Ton Cost of RDF Transportation	1710	Rs	
11	Add 18% GST	307.8	Rs	
12	Gross Per MT Cost For RDF Transportation	2017.8	Rs	
13	Per Ton revenue paid by Cement Plant	1500	Rs	
14	Net Cost of RDF Transportation	517.8	Rs	
15	Total Cost For RDF Transportation	28190482	Rs	

6.5.7 Component 8: Miscellaneous Cost

Table 6-13 Miscellaneous Cost

I	Miscellaneous Cost				
S. No	**Particulars**	**Unit**	**Months**	**Rate**	**Amount**
1	Monthly Drone/ Total Station Survey for assessment of Legacy waste processed and disposed	LS	8.9	35000	311500

2	Miscellaneous which includes internet charges, mobile charges, transportation of staffs, drinking water, refreshments, uniforms etc.	LS	8.9	50000	445000
	Total for Miscellaneous			**Rs.**	**756500**

6.6 Calculation of Total Operational Costs

Table 6-14 Abstract of Cost for Bio-remediation & Bio-mining of Legacy Waste

Abstract of Cost for Bio-remediation & Bio-mining of Legacy Waste at Ghaziabad		
S. No	**Particulars of Cost Head**	**Cost (Rs)**
1	Leasing Charge of Segregation & Material Recovery Unit	15444466.67
2	Manpower Cost for Segregation & Material Recovery Unit	4919133
3	Power Cost for Segregation & Material Recovery Unit	4951913
4	Spare & Maintenance cost of Segregation & Material Recovery Unit	3861117
5	Hiring Charge of Earth moving & other Equipment	40749176
6	Cost of Bio-culture	6124807
7	Cost of Inert Transportation	2120003
8	Cost of RDF Transportation upto Lead 250 Kms	28190482
9	Cost of Civil Work (Non-reutilisable part of Capital Cost)	8510000
10	Miscellaneous Cost	756500
11	**Project Cost without Profit without Interest (X)**	**115627598**
12	Add Profit @ 10% of 'X' (b)	11562760
13	Add Environment Management Charge @ 1% of 'X' ©	1156276
14	Add water Charge @ 1% of 'X' (d)	1156276
15	Add Labour Cess @ 1% of 'X' (e)	1156276
16	Add Contingencies @ 1% of 'X' (f)	1156276
17	Add Project Monitoring & Supervision cost @ 2% of 'X' (g)	2312552
18	**Total Project Cost with RDF Transportation (Y)=X+a+b+c+d+e+g**	**134128013**

19	**Cost for Bio-remediation & Bio-mining without RDF Transportation**	**105937531**
20	Legacy Waste deposited at site (MT)	272214.00
21	**Per MT charges for Bio-remediation & Bio-mining with RDF Transportation (Rs)**	**492.7**
22	**Per MT charges for Bio-remediation & Bio-mining without RDF Transportation (Rs)**	**389.2**

7 Summary of Cost Estimation for Biomining of Dumpsite

Table 7-1 Summary of Cost Estimation

S. No	Parameters	Cost Estimation (Rs)
1	Total Project Cost for Biomining of Ghaziabad Dumpsite with RDF Disposal Cost Included (Rs)	**134128013**
2	Total Project Cost for Biomining of Ghaziabad Dumpsite without RDF Disposal Cost Included (Rs)	**105937531**
3	Per MT charges for Bio-remediation & Bio-mining with RDF Transportation (Rs)	**493 INR/MT**
4	Per MT charges for Bio-remediation & Bio-mining without RDF Transportation (Rs)	**389 INR/MT**

With the current experience and quality of RDF material from dumpsites, cement Industries are willing to pay only the part of RDF transportation i.e up to Rs.1500/MT. Thus, in such a scenario the following is expected:
Part of RDF Transportation to be borne by cement plant and part by ULB
For scientific disposal, ULB have to transport RDF to the nearby cement plants incurring the transportation cost

8 Models for Implementing Dumpsite Remediation

8.1 Execution Methods

S. No	Execution Methods	Preference for Biomining of Ghaziabad Dumpsite
1	100% Reclamation: Design Finance Own and Operate and Transfer with near-zero residues. All work must be carried out in compliance with SWM Rules 2016 and CPCB Guidelines for the disposal of legacy waste 2019	**Preferred**
2	100% Capping (Minimum operating/ processing cost)	**-**
3	**60-70% Reclamation, rest with inert capping - Part Capping, (Nashik Model, EPC)-Processing & Operating cost lying between the first two models**	**-**

8.2 Working Models

S. No	Working Models	Preference for Biomining of Ghaziabad Dumpsite
1	100% work to outsourced to selected private contractor	**Preferred**
2	100% by ULB with rented equipment and manpower	**Not Preferred ULB lacks technical know how**
3	**Part by private operator (processing only) and rest by ULB (Utilization, transportation, and disposal)**	**Preferred**

9 Standard Procedures for Operations

9.1 Use of Screened Fractions

When planning for bio-remediation and bio-mining, it is important at the same time to identify where the screened fractions will go, in order to bring down the heap of mixed waste to fractions that would each have been usable if unmixed. None of these fractions will bring in income. In fact, their transport offsite is a cost to be budgeted for. Look for the nearest industries using solid fuel. Look for the nearest bitumen hot-mix plants and also specify Plastic Roads in road tenders to ensure offtake of the thin-film plastic fractions. Start a dialogue with all kabadi walas within the local body to see who will be willing to pick up or accept which items. Plan for offsite aggregation space for different fractions and types of waste that will result from screening. Identify aggregation and storage sheds for use by waste-picker groups or kabadi walas. Identify transporters who can transport different fractions out on their return trips.

For the bio-earth or good earth finest fraction, test periodically for heavy metals, then look for farmers willing to accept it. It is excellent for reclaiming salt-affected soils and for restoration of mining overburden areas if any are nearby. There is a cess for restoration of mined areas, which is normally unspent as forest departments are supposed to revegetate them. But this is unviable in barren rocky soil by planting and watering saplings. Revegetation is instead possible and effective by mixing grass seed with the good earth fraction and spreading it on the overburden to start a natural succession of grasses, herbs, and shrubs.

9.2 Process Management

There are several factors that must be kept in mind during implementation of the project.

9.3 Space Management

For all waste-stabilizing methods, management of space is the biggest challenge, as aeration, stabilizing and screening mostly needs to be done within the boundaries of an already overloaded dumpsite. This is achieved mainly by experience and creative common-sense. Onsite earth-mover operators often come up with the best solutions, so seek their opinions. Every dumpsite poses a case-by-case challenge, but there is no above-ground dump that cannot be successfully bio-remediated and bio-mined.

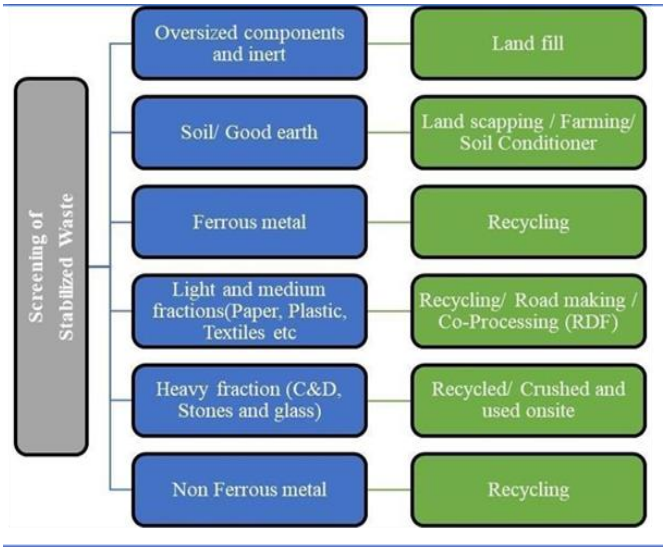
9.4 Leachate Management

Most high heaps of legacy waste are water-logged with leachate even near the topmost layers and all the way to the bottom, like a dhokla. This is not just from rainwater entering the heap but is produced by airless rotting within the entire waste heap. So, when legacy waste heaps are opened up, some leachate almost always trickles out. This is not produced by the formation of windrows or cones, which in fact help to dry out the waste by aerated decomposition.

Channels must be created to lead the oozing leachate rivulets to a lined depression or pond for treatment or for leachate recirculation onto windrows as a type of bio-culture. (test to see if heaps generate enough heat with its use). Leachate can also be treated in collection ponds by underwater composting. Bio-cultures that have been proved successful at other locations can be sprinkled onto the leachate pools. But intermittent aeration is a must, using small compressor pumps or aerators or airlift aeration or even simple manual or mechanical agitation. Aeration is necessary for the added microbes to do their work of digesting the polluting solids suspended in the dark and turbid leachate. Success is noticed by a progressive change in color from dark to light, by reduction or absence of odour and by fine bubbles rising to the surface from digested solids.

9.5 Fire Control and Safety

Most large dumpsites are smoldering from hidden fires. Methane itself is flammable with a blue flame and supports the yellow flame burning of combustible plastics, cloth, and oily rags. Sometimes flammable industrial waste finds its way onto dumpsites, aggravating the problem.



It is difficult to begin bio-remediation work on a smoking dump. Sometimes digging into the dump awakens hidden fires. So, fire control is important. Adding water increases the generation of both methane and leachate and is counter-productive, not a long-term solution, adding soil cover to smother the flames adds more material to a heap that one is trying to bring down.

There is a better way, again requiring creative common-sense and experience and training of earth-mover drivers. Most fires within heaps have a point source – a bag of textile discards or plastic waste or a ball of oily rags. Earthmover drivers must learn to dig in and pluck out these burning balls of fire. These should be laid nearby on the surface of the dump and then rubbed out with the back of the excavator shovel to extinguish the flames and smoke. Wet soil should be kept handy to immediately plug the excavated hole.

Adding composting bio-cultures can be tried, to counter the anaerobic conditions around the burning spots. Smoking points must be tackled patiently and systematically, one by one, till the dump is smoke-free to begin stabilizing operations by bioremediation.

It is important to do the risk assessment and an onsite emergency plan should be kept handy prior to commencement of dumpsite bioremediation & bio-mining.

9.6 Use of Recovered Space

The benefit of bio-mining lies in abatement of ongoing and future pollution and ill health and in the recovery and re-use of valuable space. This is ideally for continued long-term waste management since public consent for new waste sites is increasingly difficult because of earlier visible mismanagement of a virgin site. Ensure advance demarcation and declaration of a buffer zone of no new habitation for up to 500 meters around the cleared site to prevent real-estate activity from encroaching the buffer as soon as the dump is removed.

If a dump is engulfed within a growing city and its continued use for waste management is unsuitable, identify in advance the planned future use of that site and put up a signboard indicating that use, to ensure public acceptance of the biomining operations which will be temporarily noisy and dusty. This will also protect the site from land-grabbers.

Cleared dumps are not permitted for habitation for at least 15 years (SWM Rules Schedule I, H (2)). This is because of unhealthy leachate below the site and formation of flammable and offensive landfill gases from waste pockets that may remain unexcavated.

Permissible options are reuse for SWM, open stadia, sports grounds, parks and gardens, parking lots, container yards, warehouses of non-flammables and similar facilities where people are not living or working all day and night.

9.7 Bio-mining Below-Ground Waste

Many cities and towns chose abandoned quarry-pits to dump untreated waste, without realizing the permanently harmful effects of this. Leachate oozing out at the bottom of the pit cannot be seen or captured or treated and enters both shallow and deep groundwater through fissures in the rock. The hydrostatic pressure in deep quarries, as divers experience at increasing depths, forces the leachate even more forcefully into the cracks. Dark and smelly water pollution begins to show up in nearby wells and bore wells after a year or further away even after 3-4 years, after which the damage is irreversible.

But leachate in an airless rotting mass continues to form for up to 30 years, so further damage can be prevented by bio-mining the quarry-pits. This has also been ordered by the NGT (in OA179 of 2017). The waste needs to be excavated in descending layers like any open-cast mining and unloaded on the surface in windrows or conical heaps which can be turned weekly for 5-6 weeks before screening. Use of bio cultures is most important here, to control odour and the leachate which will run out while placing

excavated material. Adding bio-cultures into the pit without excavation will not give the waste and the digesting microbes the air needed for stabilizing the waste.

Immediate stoppage of further quarry-dumping of untreated waste is the most important action. The excavated quarry-pit, or any other quarry-pits that are planned for waste disposal, must first be filled to ground level with only debris and construction and demolition waste up to slightly above surrounding ground level. The newly created space can then be used for waste stabilizing by unloading fresh waste in windrows here and turning them regularly. Any small quantity of leachate produced will be visible as it runs out from the edges of the heaps. Bio- mining /screening may have to be interrupted during monsoons, both above grounds and below ground.

9.8 Environmental Risks and Environmental Management Plan

There are several potential environmental risks associated with bio-mining projects and therefore a plan addressing these potential risks should be kept ready. Most of the conditions present at the landfill and its surroundings will be unique to the specific landfill, and specific to the age of the waste being excavated.

Majorly the risks would be associated with proper management of hazardous waste that may be uncovered during the operations of reclamation, managing the releases of gases, odours, its associated risks to human health and controlling any fire, subsidence or collapse.

Environmental risks can be managed well if considered in advance of the operations and appropriate mitigation measures have been designed by the executing agency.

9.9 Environment Management Plan

In consideration to the prevailing site features and the proposed Solid Waste Management Facilities, it is necessary to ensure that the proposed plant and facilities would be adequately designed with necessary environment protection measures. This Chapter accordingly outlines the environment protection measures for the proposed dumpsite remediation for Ghaziabad dumpsites. During project implementation period special emphasis would be made on measures to minimize leachate/ effluent generation and dust control at source. The sources and types of pollution with broad level mitigation measures is outlined in the following sections.

9.9.1 Air Pollution Measures

Air environment including Ambient Air Quality and odour generation due to the proposed project during construction and operational phases would be accounted. The principal sources of air pollution are construction activities, truck movement with construction materials and municipal solid waste, loading and unloading of materials, vehicular exhaust. The impact is generally confined to the project area and is expected to be negligible outside the project site boundaries. The pollutants their sources and mitigation measures to be adopted are presented in **Table 9-1**.

Table 9-1 Pollutants & Mitigation Measures

S No.	Pollution Source	Pollution Emitted	Mitigation Measures
Air Pollution Mitigation Measures			
1	Construction activities	SO2, NOX, Particulates, Odour etc.,	Dust suppression by water sprinkling.
2	Vehicular Movement		Bitumen covered internal roads.
3	Loading and unloading of trucks		Wheel Washing Bay at the entry point. Vehicles carrying of construction materials and waste to be covered with tarpaulin/ plastic sheet.
4	Processing of waste		waste handling area rest to be covered Provision of green belt
Water Pollution Mitigation Measures			
5	Domestic Waste	Suspended solids, BOD, etc.	Septic Tank/Soak Pit.
6	Leachate from windrow area		LTP for recycling. Storm water drainage system.
Solid Waste Management			
7	Construction	Construction materials e.g. coarse aggregate, fines aggregate, bricks, steel etc.	Recycled or used for filing/ levelling of low-lying areas within the site or transported outside.

9.9.2 Water Pollution Measures

The water demand for the project which would be in the range of 3 KLD. No surface water would be tapped. The source of water would be the Ground water. The main wastewater generation sources during construction phases would be equipment washed water and other surface run-off with suspended solids loading and sewage from temporary sanitary facilities with BOD loading. During construction activity the surface run-off would be diverted to working pit to arrest the suspended solids if any and the settled water would be reused for construction purposes, and for sprinkling on roads to control the dust emission, etc. During operation phase, the wastewater would be from drinking and sanitary use, leachate from bioremediation/windrows area. The domestic wastewater would be treated in septic tank followed by Soak pit. Maximum leachate generation from the windrows and other areas would be treated.

The Leachate generated at various places in the plant would be collected and properly treated in an LTP. The treated leachate would be sprayed on windrow to maintain suitable temperature and moisture. Leachate generated during precipitation period would be stored in evaporation pond. Based on the rainfall intensity of the plant area,

separate storm water drainage system would be properly designed. Storm water would be collected in a centralized pit to arrest the silt particulates and clear water would be used locally for landscaping and fountains. Surplus water would be released into public drains or adjacent nala. The pollutants their sources and mitigation measures to be adopted are given below.

9.9.3 Noise

Noise pollution would be resulted from transportation, construction phase and processing phase. To reduce noise pollution, high-grade machinery would be used. There would not be any major noise-causing activity during operational phase

9.9.4 Ecology of area

Site clearing or operational activities would not impact the ecology of the area adversely, since there are no known rare, endangered, or ecologically significant animal and plant species in the area. The scientific processing would have a beneficial impact on the surrounding terrestrial and aquatic ecology

9.9.5 Green Belt Development

In order to arrest wind borne fugitive dusts around the plant boundary with about 3-5 m wide green coverage based on locally available plant species. The green belt developed would help to capture the fugitive emissions, attenuate the noise generation and improve the aesthetics. All open spaces, where tree plantation may not be possible, would be covered with shrubs and grass to prevent erosion of topsoil.

9.9.6 Solid Waste Disposal

During the construction phase, the solid waste would be different types of raw materials such as coarse aggregate, fines aggregate, bricks, steel etc. being used during construction stage. The solid waste generated during this period would be predominantly inert in nature. During operation phase appropriate management of solid rejects from different processing activity would be undertaken. Sanitary landfilling would be adopted for rejects generated from processing. The pollutants, their sources and mitigation measures to be adopted are presented in Table below.

10 Annexure-I Management Plans

10.1 Reporting Formats during Active Operation period

10.1.1 Weighment/ Volume, Acceptance and Rejection of SWM

Following data will be recorded to record the weighment of legacy waste processed:

i.) Date of operation
ii.) Registration number of the truck supplying SWM / Lorry number
iii.) Total volume of the truck trolley
iv.) Total laden weight
v.) Total un-laden weight
vi.) Net weight of waste
vii.) In-situ volume of waste excavated (Net weight of waste/ In-situ density)
viii.) Time of entry of the truck
ix.) Area of dumpsite (phase) from where waste has been collected
x.) Trip Number
xi.) Time of Trip and material unloading

10.1.2 Leachate Collection and Removal System ("LCRS")

i.) No overflow of Leachate from the LCRS.
ii.) No untreated Leachate to be let out from the Site, unless it meets the standards

10.1.3 Environment Monitoring System

A standard protocol will be prepared for environmental Monitoring to be carried out in the following zones:

i.) On and within and surrounding area as well as from 500 m radius outside from the project and project facilities.
ii.) On and within the Scientific disposal area
iii.) Leachate Collection and treatment facilities in the project site as well as in the Scientific disposal area
iv.) Upstream and downstream ground water
v.) In the atmosphere/ local air above and around the Scientific disposal area

10.1.4 Reporting

i.) The following data should form part of the reports to be submitted by the Contractor and monitored by PMC and Authority:
   a. Daily excavated weight and volume of compacted waste with extent of area and volume in cubic meter.
   b. Quantity of waste segregated in each day in Metric Ton and cubic meter.
   c. Quantity (in cubic meter) of waste taken out in each day including RDF, eco bricks, soil, C&D and residual Solid Waste to facility for Scientific disposal etc. as far as category wise.

d. Leachate generation and treatment reports
e. Rainfall days
f. Quality test reports as and when made.
g. All "as-built" Drawings of any Development undertaken after COD.
h. Residual Solid Waste Matter quality test reports (including moisture content)
i. Leachate generation
j. Ground Water quality (both within and outside the Site)

10.1.5 Report scheduling

Following events would be verified and reports will be submitted to client:

Period/Event	Verification	Applicable report to be issued by the Project Monitoring Consultant
1. Implementation Period	• Review Weekly progress report submitted by the Concessionaire • Issue "Notice to Remedy" in event of non-compliance by the Contractor • Issue provisional/ Readiness Certificate	-As per requirement.
2.Monitoring at Weighbridge	• Verify weighment slip • Verify monthly Tipping Fee Statement	-As per requirement.
3.Monitoring at Waste Inspection Area	• Verify recording of Test results • Verify monthly Tipping Fee Statement and penalties (if applicable)	As per requirement.
4. Random Inspections of Project facilities	• Advise ULB/Dept on penalties payable by the Contractor	As per requirement.
6. Force Majeure Material and Persistent Breach of O&M Requirements / Events of Default.	• Issue "Notice to Remedy" in event on non-compliance • Record Events of Default, Material/Persistent Breach of O&M Requirements, Force Majeure Events	
7. Hand back and Transfer of Project Facilities	• Specify list of works/jobs to be carried out by the Contractor. • Specify list of items to be handed back and transferred back to ULB by the Contractor. • Verify compliance by the Contractor with Hand back and Transfer Requirements	As per requirement.

10.2 Log Book Formats as part of Standard Operating Procedures

This operation manual details out the logbooks to be followed for Bioremediation and Biomining Project of Legacy Waste by producing soil enricher (Bio Earth), SCF, C&D Waste and Inert.

A. Data Sheet of Proposed Equipment's

1. List of Equipment's

Name of Equipment	Nos.	Make Model

2. Daily Inspection Equipment/Machinery

Name of Equipment	Nos.	Make Model

3. Name and Designation of Key Experts

Domain	Name of Expert	Contact Details

B. Security

It is imperative that landfill sites are secure from unauthorised access. Only vehicle related to waste, construction material, Recovered and engaged resource and visitor will be permitted.

A. REJECTS–OUT FORMATE

S. No	Date	Type of vehicle	Vehicle no	Gross weight	Tear weight	Net Weight	Time In	Time Out	Driver Name	Sign Security

B. GOODS ENTRY–FORMATE

S. NO.	DATE	PARTY NAME	ITEM	BILL NO.	QTY.	CARRIED BY	TIME	SIGNSECURITY

C. VISITORS REGISTER FORMATE

S. NO.	DATE	PERSONS NAME	PURPOSE	MEET TO WHOM	IN TIME	OUT TIME

D. WORKSHOP AND MACHINERY STORAGE AREA

The list of Machinery, equipment and materials will be recorded every day and will be enlisted for their monitoring and supervision. The activity of same shall be as follows:

S. No.	Machinery/Material/Equipment	Date of Inspection	Status
1			
2			
Checked by:		Inspected By:	

LOG BOOK FORMATS

A. WINDROW FORMATION

Log Book of Windrow

Name of Project Site-

Contact Details-

Windrow Identification No.- Date-

Shape of Windrow:

Date of Formation: No. of Windrow Formed:

Dimension of Windrow: Avg. Length:
Avg. Width: Top Bottom
Avg. Height:

Remarks:

Submitted By Checked By Approved By

B. WINDROW TURNING

Log Book of Windrow

Name of Project Site-

Contact Details-

Windrow Identification No.- Date-

Shape of Windrow:

Date of Formation:

	Date	Colour	Deployed Vehicle
1st Turning:			
2nd Turning			
3rd Turning			
4th Turning			
5th Turning			

Remarks:

Submitted By Checked By Approved By

C. ADDITION OF INOCULUM

Log Book of Inoculum

Name of Project Site- Contact

Details-

Date of Formation: Qty. of Inoculum:

Date of Preparation of Inoculum-

Windrow Identification No.	Date	Mode of Spraying

Remarks:

Submitted By Checked By Approved By

D. DUTY SLIP OF VEHICLE

DUTY SLIP OF VEHICLE

Name of Project Site: Date:

Vehicle No.: Driver's Name:

Reporting Site:

Time Leaving Garage: K.M

Time at Reporting Site K.M

Time of Release K.M

Time of Garaging K.M

Releasing Place: Date:

Remarks:

Submitted By Checked By Approved By

E. TROMELLING

Log Book of Screening Machine

Name of Project Site-

Dat

e- Contact Details of Operator-

Site Identification No.- Shift

No.- Source of Stablised Waste:

Windrow Identification No.:

Excavator Engaged for Loading:

Vehicle Engaged for

Transportation:

Vehicle Engaged for Feeding to Hopper:

	Trommel (>125	Trommel (>35	Trommel (<6 mm)
Starting Time			
Closure Time			
Remarks			
Starting Time			
Closure Time			
Remarks			
Starting Time			
Closure Time			
Remarks			

Submitted By Checked By Approved By

F. REJECTS MANAGEMENT

Log Book of Rejects

Name of Project Site- Date:-

Contact Details of Operator-

Site Identification No:- Shift No:- 1 2 3

Rejects Storage Details:

	Vehicle Engaged for Loading	Vehicle Engaged for Transportation	No. of Trips	Weight Per Trip	Location of Storage
Rejects (>125					
Rejects (>35					
Trommel (>6					
Trommel (<6					
Remarks:					

Submitted By Checked By Approved By

11 Annexure – II Appendix:

11.1 Environment Management and Monitoring Plan

11.1.1 Pollution Mitigation Measures

S. No.	Pollution Sources	Pollutants Emitted	Mitigation Measures
Air Pollution Mitigation Measures			
1.	Construction activities	SO2, NOX, Particulates, Odour etc.	• **Dust suppression by water sprinkling.** • **Bitumen covered internal roads.** • **Wheel Washing Bay at the entry point.** • **Vehicles carrying of excavated materials, construction materials and waste to be covered with tarpaulin or plastic sheet.** • **Proper ventilation and moisture in the compost plant and windrow area to be maintained and herbal insecticides to be sprayed around odour generation areas at regular intervals.** • **Covered landfill by polyethylene sheets except the active waste laying area** • **Green belt would be provided along the internal roads and plant boundary**
2.	Vehicular Movement		
3.	Loading and unloading of Trucks		
4.	DG Set		
5.	Processing of waste		
Water Pollution Mitigation Measures			
6.	Domestic Waste	Suspended Solids, BOD etc.	**Septic Tank with Soak Pit.** **LEP for recycling.**
7.	Leachate from Windrow		
8.	Leachate from landfill		**Storm water drainage system**
Waste Management			
9.	Construction	Construction materials e.g. coarse aggregate fine aggregate, bricks, steel etc.	**Recycled or used for filling or levelling of low-lying areas within the site or transported outside to locations as identified by the Municipality.**
10.	**LTP sludge or evaporation pond**	**ETP sludge or evaporation pon**	Sanitary Landfilling

11.1.2 Environment Monitoring

Monitoring for air quality parameters as per CPCB ambient air quality standards and surface water quality would be carried out on a regular basis or as and when required.

Environmental Component	Locations	Frequency	Parameters to be Monitored
Ambient Air Quality	Nearby habitations, upwind, downwind, crosswind	Quarterly	**PM10, PM2.5, SO2, NOx, CH4, CO, Ammonia, H2S, Odour**
Noise	Within site (DG set, Compost yard, Sanitary Landfilling area) and nearest habitation	Quarterly	**Noise Levels (Leq)**
Groundwater / surface water	Water samples from piezometric monitoring wells at 5-6 locations within 50 meters of periphery of landfill site, ground water from the nearest tube well, stream and River	Quarterly	**IS 10500:2012 drinking water parameters**
Leachate	Windrow of compost plant, Secured landfill, (active area)	Quarterly (TCLP Test)	**SS, TDS, pH, BOD, COD, As, CN, Cl, heavy metals**
Landfill gas	Landfill area	Quarterly	**Methane & CO2**
Compost	Final product	Monthly once	**As, Cd, Cr, Cu, Hg, Ni, Zn, C/N ratio, pH**
Pathogens and Fly test	Within 200 m of Facility	Once in 6 months	**As applicable**

11.1.3 Design Environmental Targets

The proposed project shall abide by the following design environmental norms and prevailing environmental quality but not limited to

11.1.4 Ambient Air Quality

It shall be as per National Ambient Air Quality Standards, CPCB, GoI.

11.1.4.1 Noise Level

It shall be as per the noise pollution (regulation and control) rules, 2000

11.1.4.2 Water Quality

The Leachate disposal shall be as per SWM rules 2016.

12 Annexure – III Technical Specification for 40 TPH Capacity

S. No.	Parameters	Units	Nos required
1	Machineries- 1 set		
1.1	*Belt Conveyors (Roller Belts) along with supporting structure along with cabe tray and electrical panels*		
1.1.1	*Feeding Conveyor for Trommals (12.0 M long, 1.2 M wide))*	Nos	*2*
1.1.2	*Discharge Conveyor for Trommals (10.0 M long, 1.0 M wide)*	Nos	*2*
1.1.3	*Discharge Conveyor for Trommals (8.0 M long, 1.0 M wide)*	Nos	*4*
1.1.4	*Feeding Conveyor for VADS (15.0 M long, 1.0 M wide))*	Nos	*1*
1.1.5	*Discharge Conveyor for VADS (7.0 M long, 0.8 M wide)*	Nos	*1*
1.1.6	*Feeding Conveyor for Destoner (9.0 M long, 1.0 M wide))*	Nos	*1*
1.1.7	*Discharge Conveyor for Destoner (7.0 M long, 0.8 M wide)*	Nos	*1*
1.2	*Trommel Screen with Anti Clogging device*		
1.2.1	*Trommel Screen with 120 mm & 80 mm Hole, size 9.0 m LongX2.0 m dia*	Nos	*1*
1.2.2	*Trommel Screen with 35 mm & 16 mm Hole, size 9.0 m Long X 1.5 m dia*	Nos	*1*
1.3	*Volumetric Air Density Separators with Cyclone (10 TPH)*	Nos	*2*
1.4	*Destoner (10 TPH)*	Nos	*1*
1.5	*Magnetic Separator*	Nos	*1*
1.6	*Offline Shredder (10 TPH)*		*1*
2	*PLC & SCADA System*	*1 Set*	1
3	Main Panel	Nos	1
4	Cables	LS	1

1. Pre segregation Trommel

Description	Details
Trommal	Capacity 40 TPH. Coarse (150 mm) segregation
Screen Drum dia	2000mm
Screen Drum Length	9000mm
Screen/Trommel Speed	13-14 r.p.m
Screening perforation	150 mm & 80 mm dia Perforated sheet
Main Tyre Rings Roller/Wheel assemble Guide Roller	Tyre Rings: 2 Nos. Fabricated with 25 mm plate, dia 2250 mm x 120 mm wide 6 Nos. Rubber friction roller Rubber roller 530mm dia x 140mm wide Bearing size: 70mm, UCP – 214 Guide Rollers: 2 Nos. will be provided
Central Ring	Will be provided for strength
Screen Shell	Drum 6mm thk, IS 2062
Supporting Structure	ISMC/ISMB of sufficient thickness Base Plate – 20mm thk, IS 2062
Screen cover	Bottom half will be covered
Drive Unit	1 x 7.5 k.w Motor, 1440 RPM flange mounted, gear box M-0722 – 14, actual ratio 14.34:1, SF – 1.49 output RPM-101 Final Drive through Chain & Sprocket – 1" pitch duplex 21teeth & 41 teeth
Quantity	1 No.

2. Trommel 2 (35 mm & 16 mm)

Description	Details
Trommal	Capacity 15 TPH, Fine (16 mm) segregation
Screen Drum dia	1500mm
Screen Drum Length	9000mm
Screen/Trommel	14-15 r.p.m
Screening perforation	35 mm & 16 mm dia Perforated sheet,
Main Tyre Rings Roller/ Wheel assemble Guide Roller	Tyre Rings: 2 Nos. Fabricated dia 1750 mm x120 mm x25 mm thk 6 Nos. Rubber friction roller Rubber roller 530mm dia x 140mm wide Bearing size: 70mm, UCP – 214
Central Ring	Will be provided for strength
Screen Shell	Drum thk 6mm thk, IS 2062
Supporting Structure	ISMC./ISMB of sufficient thickness Base Plate – 20mm thk, IS 2062
Screen cover	Bottom half will be covered
Drive Unit	1 x 7.5 k.w motor, 140 RPM flange mounted, Gear box M-0622–14, actual ratio15.52:1, SF – 1.43, output RPM-93
Quantity	1 no.

3. Volumetric Air Density Separator

Technical Data sheet VADS	
Description	Specification
Material to be handled	MSW
Bulk density	0.6 - 0.8 T/M3
Feed Capacity	10 TPH
Inclination Angle	7 - 17 degree
Ballaster Size	4800 mm x 2050 mm x 3000 mm
Deck & paddles	Double deck with 5 paddles
Deck mesh size	Mesh opening top Deck 80 mm & bottom deck 20 mm
Deck size	3620 mm x 405 mm Approx. (5 + 5) = 10 nos.
Material of construction	MS, IS: 2062
Drive arrangement	Electro Mechanical
Geared Motor	Motor 7.5 Kw/1500 RPM x 2 nos. & Gear box K-632-8, RPM 182 – 2 nos.
Final drive	Direct coupled
Material of Construction	Screen body 5 mm thk, with stiffner, IS:2062
Inlet Chute	Inlet chute 5 mm thk, IS:2062
Oversize chute	Oversize chute 5 mm thk, IS:2062
Body	Frame shall be fabricated from rolled steel sections
Drive Shaft material	EN-8
Air Blower	Centrifugal type
Capacity	
Pressure	18” WG
Blower Motor	5.5 Kw/3000 RPM

4. Fine Screening Trommel (6 mm)

Description	Details
Trommal	Capacity 15 TPH, Fine (16 mm) segregation
Screen Drum dia	1500mm
Screen Drum Length	5500mm
Screen/Trommel Speed	14-15 r.p.m
Screening perforation	6 mm dia Perforated sheet,
Main Tyre Rings Roller/Wheel assemble Guide Roller	Tyre Rings: 2 Nos. Fabricated dia 1750 mm x 120 mm x 25 mm thk. 4 Nos. Rubber friction roller Rubber roller 530mm dia x 140mm wide Bearing size: 70mm, UCP – 214 Guide Rollers: 2 Nos. will be provided
Central Ring	Will be provided for strength
Screen Shell	Drum thk 6mm thk, IS 2062
Supporting Structure	ISMC/ISMB of sufficient thickness Base Plate – 20mm thk, IS 2062
Screen cover	Bottom half will be covered
Drive Unit	1 x 5.5 k.w motor, 140 RPM flange mounted, Gear box M 0622 – 14, actual ratio15.52:1, SF – 1.43, output RPM-93 Final Drive through Chain & Sprocket – 1" pitch duplex, 21 teeth & 41 teeth
Quantity	1 no.

5. Single Shaft Shredder

Specification	Details	Remark
Equipment	Shredder two Roll type	
Capacity	10 TPH	
Material to be Shredded	MSW	
Shredder Speed	35 rpm	
Blade size	dia 500 mm x 1500 mm rotor length	
Blade material	EN-19	
Blade thickness	30 mm	
Shaft	Hexagonal 190 mm and 150 mm dia at bearing	
Shaft material	EN-9	
Body	fabricated	
Feed Hopper	1600 x 1600 x 750 mm	
Discharge	Open type	
Drive Unit		
Motor	30 Kw/1500 RPM flange mounted	
Gear Box	K-1032 – 41.49:1, output RPM- 35, SF-1.91	
Final drive	Direct coupled	
Quantity	1 no.	

DETAIL SPECIFICATION OF SUSPENDED PERMANENT MAGNET FOR 1000 mm WIDE BELT

Type Suspension Magnet (Permanent magnetic type)

Installation To Right angle of Belt Conveyor

Type of Magnet High intensity magnet

Operating Height 250 mm approx.

Magnet Size 1000 mm W x 800 mm L x 250 mm Ht.

Quantity 01 no.

MCC			
S.No.	**Description**	**Unit**	**Data**
	MCC Panel		
1	Applicable standards		IS
2	Rated voltage		415V
3	Type of execution		Fixed
	For ACB modules		Fixed
	For rest of the modules		Fixed
4	Panel Construction		
	Material (cold rolled/ hot rolled)		CRCA sheet
	Thickness	mm	2
5	Short time thermal rating & duration	kA/Sec	50kA for 1 Sec.
6	One minute P.F voltage withstand	kV	2.5 (For main circuit)
7	Degree of protection for enclosure		IP 42
8	Material of busbar		Alluminium
	MCCB		
1	Make		L&T/ Schneider/ ABB/ GE
2	Applicable standard		IS
3	Rated voltage		415 V
4	Rated Current		As required
5	Rated symmetrical breaking current	kA rms	50kA for 1 Sec.
3	Contactors		
1	Make		ABB/GE/L&T/ Schneider
2	Rated Voltage of Coil		110V AC
3	Rated utilization category		AC3 for non-reversible
4	Rated Current		As required
4	Current Transformer		
4.1	Make		AE/KAPPA/Eq.
4.2	Applicable standard		IEC
4.3	Type		Cast resin

13 Annexure – IV Detailed Estimate for Civil Work

Abstract of Cost of Civil Work for Bio - mining of Waste		
S. No.	**Particulars**	**Cost in Lacs**
1	*Estimate of Site Development & Construction of 1 Nos Waste Processing Shed*	44.00
2	*Estimate of Container Office, Portable Toilets & Weighbridge*	7.20
	Total in Lacs	**51.20**

Estimate of Container Office, Portable Toilets & Weighbridge						
S. No.	**Item No**	**Description**	**Qty.**	**Unit**	**Rate**	**Amount**
1	NS	Container Office	1	Nos	2,25,000.00	2,25,000.00
2	NS	Portable Toilets	1	Nos	50,000.00	50,000.00
3	NS	Weighbridge	1	Nos	5,45,000.00	5,45,000.00
					Total Rs.	**8,20,000.00**
					Say in Lacs	**8.20**

Abstract of Site Development & Construction of Waste Processing Shed						
S. No.	**DSR 2021**	**Description**	**Qty**	**Unit**	**Rate**	**Amount**
1	**2**	**3**	**4**	**5**	**6**	**7**
1	2.6	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sq.m on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer -in-charge	322.99	Cum	205.45	66358.00
2	2.27	Supplying and filling in plinth with sand under floors, including watering, ramming, consolidating and dressing complete.	116.89	Cum	2161.20	252617.00

Abstract of Site Development & Construction of Waste Processing Shed						
S. No.	**DSR 2021**	**Description**	**Qty**	**Unit**	**Rate**	**Amount**
1	**2**	**3**	**4**	**5**	**6**	**7**
3	4.1	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering-All work up to plinth level				
	4.1.8	1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) derived from natural sources: 3 graded ston aggregate 20 mm nominal size derived from natural sources)	132.85	Cum	6326.05	840416.00
4	5.2	Providing and laying cement concrete in retaining walls, return walls, walls (any thick ness) including attached pilasters, columns, piers, abutments, pillars, posts, struts, buttresses, string or lacing courses, parapets, coping, bed blocks, anchor blocks, plain window sills, fillets, sunken floor etc., up to floor five level, excluding the cost of centering, shuttering and finishing				
	5.2.2	1:1.5:3 (1 cement: 1.5 coars sand(zone-III) derived fro natural sources: 3 graded ston aggregate 20 mm nominal siz derived from natural sources	78.20	Cum	10185.05	796496.00
5	5.22	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level				
	5.22 A.6	TMT bars of grade Fe 500 or more				
		Upto plinth level	3775.65	Kg	89.65	338487.00
		Above plinth level	2363.24	Kg	89.65	211865.00

Abstract of Site Development & Construction of Waste Processing Shed						
S. No.	**DSR 2021**	**Description**	**Qty**	**Unit**	**Rate**	**Amount**
1	**2**	**3**	**4**	**5**	**6**	**7**
6	12.50	Providing and fixing percolated galvanised iron profile sheets (size, shape and pitch of corrugation as approved by Engineer-in-charge) 0.50 mm (+ 0.05 %) total coated thick ness with zinc coating 120 grams per sqm as per IS: 277, in 240 mpa steel grade, 5-7 microns epoxy primer on both side of the sheet and polyester top coat 15-18 microns. Sheet should have protective guard film of 25 microns minimum to avoid scratches during transportation and should be supplied in single length upto 12 metre or as desired by Engineer in-charge. The sheet shall be fixed using self-drilling/self-tapping screws of size (5.5x 55 mm) with EPDM seal, complete upto any pitch in horizontal/ vertical or curved surfaces, excluding the cost of purlins, rafters and trusses and including cutting to size and shape wherever required	1120.00	Sqm	671.55	752136.00
7	10.1	Structural steel work in single section, fixed with or without connecting plate, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete	9727.64	Kg	93.05	905157.00
8	13.48	Finishing with Deluxe Multi surface paint system for interiors and exteriors using				

Abstract of Site Development & Construction of Waste Processing Shed						
S. No.	**DSR 2021**	**Description**	**Qty**	**Unit**	**Rate**	**Amount**
1	**2**	**3**	**4**	**5**	**6**	**7**
		Primer as per manufacturers specifications				
	13.48.3	Painting Steel work with Deluxe Multi Surface Paint to give an even shade. Two or more coat applied @ 0.90 ltr/10 sqm over an under coat of primer applied @0.80 ltr/10 sqm of approved brand and manufacture	364.59	Sqm	140.05	51061.00
9	12.4.1	Providing ridges or hips of width 60cm over all width plain G.S. sheet fixed with polymer coated J. or L hooks, bolts and nuts 8 mm dia. G.I. limpet and bitumen washers complete (0.80mm thick with zinc coating not less than 275gm/m^2)				
		For processing shed- In ridges	50.00	Metre	822.15	41108.00
10	12.7.1	Providing and fixing 15 cm wide 45 cm over all semi-circular plain G.S sheet gutter with iron brackets 40x3 mm size, bolts, nuts and washers etc. including making necessary connections with rain water pipes complete. 0.8 mm thick with zinc coating not less than 275 gm/sqm				
		For processing shed-In Gutter	50.00	Metre	811.85	40593.00
11	12.41.2	Providing & fixing on wall face unplasticised Rigid PVC pipes rain water pipes conforming to IS : 13592 Type A including jointing with seal ring conforming to IS: 5382 leaving 10 mm gap for thermal	156.00	Metre	319.75	49881.00

Abstract of Site Development & Construction of Waste Processing Shed						
S. No.	**DSR 2021**	**Description**	**Qty**	**Unit**	**Rate**	**Amount**
1	**2**	**3**	**4**	**5**	**6**	**7**
		expansion (i) Single socketed pipes.110 mm diameter.				
12	17.37.1	Providing & fixing M.S holder-bat clamps of approved design to Sand Cast iron/cast iron (spun) pipe embedded in and including cement concrete blocks 10x10x10cm of 1:2:4 mix (1 cement : 2 coarse sand: 4 graded stone aggregate 20 mm nominal size) including cost of cutting holes and making good the wall etc.				
		100 mm dia Pipe	78.00	Each	308.45	24059.00
					Total Rs.	**43,70,234.00**
					Say in Lacs	**44.00**

Detail of Segregation Shed								
S. No.	**DSR 2021**	**Description**	**No.**	**L**	**B**	**H**	**Qty.**	**Unit**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1	2.6	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge						
	2.6.1	All kinds of Soil						
	(i)	For processing shed	1	50.00	10.00	0.150	75.00	
	(ii)	For stabilised waste storage pad	1	50.00	20.00	0.150	150.00	
		For foundation pillars						

Detail of Segregation Shed								
S. No.	**DSR 2021**	**Description**	**No.**	**L**	**B**	**H**	**Qty.**	**Unit**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
	(iii)	For processing shed	26	1.50	1.50	1.675	97.99	
						Total	**322.99**	**Cum**
2	2.27	Supplying and filling in plinth with sand under floors, including watering, ramming, consolidating and dressing complete.						
	(i)	For processing shed	1	50.00	10.00	0.075	37.50	
	(ii)	For stabilised waste storage pad	1	50.00	20.00	0.075	75.00	
		For foundation pillars						
	(iii)	For processing shed	26	1.50	1.50	0.075	4.39	
						Total	116.89	Cum
3	4.1	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering-All work up to plinth level						
	4.1.8	1:4:8 (1 Cement: 4 coarse sand (zone-III) derived from natural sources: 8 graded stone aggregate 40 mm nominal size derived from natural sources)						
	(i)	For processing shed	1	50.00	10.00	0.10	50.00	
	(ii)	For stabilised waste storage pad	1	50.00	20.00	0.075	75.00	
		For foundation pillars						
	(iii)	For processing shed	26	1.50	1.50	0.10	5.85	
						Total	132.85	Cum

Detail of Segregation Shed								
S. No.	**DSR 2021**	**Description**	**No.**	**L**	**B**	**H**	**Qty.**	**Unit**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
4	5.2	Providing and laying cement concrete in retaining walls, return walls, walls (any thickness) including attached pilasters, columns, piers, abutments, pillars posts, struts, buttresses, string or lacing courses, parapets, coping, bed blocks, anchor blocks, plain window sills, fillets, sunken floor etc., up to floor five level, excluding the cost of centering, shuttering and finishing						
	5.2.2	1:1.5:3 (1 cement : 1.5 coarse sand(zone-III) derived from natura sources : 3 graded stone aggregat 20 mm nominal size derived from natural sources						
		For foundation pillars						
	(i)	For processing shed (Pedestal)	26	1.25	1.25	0.30	12.19	Cum
		Same as above but in columns upto plinth level.						
		For foundation pillars						
	(i)	For processing shed	26	0.450	0.30	1.00	3.51	Cum
		Same as above but in super structure.						
		For foundation pillars						
	(i)	For processing shed	26	0.450	0.30	5.50	19.31	Cum
		Same as above but in Tie beams & plinth beam						
	(i)	For processing shed- Plinth Beam	2	50.00	0.30	0.300	9.00	
			26	10.00	0.30	0.300	23.40	
	(ii)	For processing shed - Tie Beam	2	50.00	0.30	0.300	9.00	
			2	10.00	0.30	0.300	1.80	
						Total L:1.5:3)	78.20	Cum

Detail of Segregation Shed								
S. No.	**DSR 2021**	**Description**	**No.**	**L**	**B**	**H**	**Qty.**	**Unit**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
5	5.22	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level						
	5.22. A .6	TMT bars of grade Fe 500 or more						
		Upto Plinth level	1.0%	of item			**3775.65**	Kg
		8mm (30%)					1132.70	
		12 to 16 mm (70%)					2642.95	
	5.22 A	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete above plinth level.						
	5.22.A .6	TMT bars of grade Fe 500 or more						
		Above plinth level	1.0%	of item			**2363.24**	Kg
		8mm (30%)					708.97	
		12 to 16 mm (70%)					1654.27	

Detail of Segregation Shed								
S. No.	**DSR 2021**	**Description**	**No.**	**L**	**B**	**H**	**Qty.**	**Unit**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
6	12.50	Providing and fixing percolated galvanised iron profile sheets (size, shape and pitch of corrugation as approved by Engineer-in-charge) 0.50 mm (+ 0.05%) total coated thickness with zinc coating 120 grams per sqm as per IS: 277, in 240 mpa steel grade, 5-7 microns epoxy primer on both side of the sheet and polyester top coat 15-18 microns. Sheet should have protective guard film of 25 microns minimum to avoid scratches during transportation and should be supplied in single length upto 12 metre or as desired by Engineer in-charge. The sheet shall be fixed using self-drilling/self-tapping screws of size (5.5x 55 mm) with EPDM seal, complete upto any pitch in horizontal/ vertical or curved surfaces, excluding the cost of purlins, rafters and trusses and including cutting to size and shape wherever required	2	50.00	11.20		1120.00	Sqm
7	10.1	Structural steel work in single section, fixed with or without connecting plate, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete					9727.64	Kg
8	13.48	Finishing with Deluxe Multi surface paint system for interiors and exteriors using Primer as per manufacturers specifications						

Detail of Segregation Shed								
S. No.	**DSR 2021**	**Description**	**No.**	**L**	**B**	**H**	**Qty.**	**Unit**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
	13.48.3	Painting Steel work with Deluxe Multi Surface Paint to give an even shade. Two or more coat applied @ 0.90 ltr/10 sqm over an under coat of primer applied @ 0.80 ltr/10 sqm of approved brand and manufacture						
		For Angle, Channel and plate	1	364.59			364.59	
						Total	**364.59**	**Sqm**
9	12.4.1	Providing ridges or hips of width 60cm over all width plain G.S. sheet fixed with polymer coated J. or L hooks, bolts and nuts 8 mm dia. G.I. limpet and bitumen washers complete (0.80mm thick with zinc coating not less than 275gm/m^2)						
		For processing shed- In ridges	1	50.00			50.00	M
10	12.7.1	Providing and fixing 15 cm wide 45 cm over all semi-circular plain G.S sheet gutter with iron brackets 40x3 mm size, bolts, nuts and washers etc. including making necessary connections with rain water pipes complete. 0.8 mm thick with zinc coating not less than 275 gm/Sqm.						
		For processing shed- In Gutter	1	50.00			50.00	M
11	12.41.2	Providing & fixing on wall face unplasticised Rigid PVC pipes rain water pipes conforming to IS : 13592 Type A including jointing with seal ring conforming to IS : 5382 leaving 10 mm gap for thermal expansion (i) Single socketed pipes. 110 mm diameter.	26	6.00			156.00	M

Detail of Segregation Shed								
S. No.	**DSR 2021**	**Description**	**No.**	**L**	**B**	**H**	**Qty.**	**Unit**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
12	17.37.1	Providing & fixing M.S holder-bat clamps of approved design to Sand Cast iron/ cast iron (spun) pipe embedded in and including cement concrete blocks 10x10x 10 cm of 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) including cost of cutting holes and making good the wall etc.						
		100 mm dia Pipe	78				78.00	Each

Reference for Cost Index Delhi Schedule of Rates Year 2021

2.0 EARTH WORK

Code No.	Description	Unit	Rate ₹
2.1	Earth work in surface excavation not exceeding 30 cm in depth but exceeding 1.5 m in width as well as 10 sqm on plan including getting out and disposal of excavated earth upto 50 m and lift upto 1.5 m, as directed by Engineer-in- Charge:		
	2.1.1 All kinds of soil	sqm	107.00
2.2	Earth work in rough excavation, banking excavated earth in layers not exceeding 20cm in depth, breaking clods, watering, rolling each layer with ½ tonne roller or wooden or steel rammers, and rolling every 3rd and top-most layer with power roller of minimum 8 tonnes and dressing up in embankments for roads, flood banks, marginal banks and guide banks or filling up ground depressions, lead upto 50 m and lift upto 1.5 m :		
	2.2.1 All kinds of soil	cum	862.70
2.3	Banking excavated earth in layers not exceeding 20 cm in depth, breaking clods, watering, rolling each layer with ½ tonne roller, or wooden or steel rammers, and rolling every 3rd and top-most layer with power roller of minimum 8 tonnes and dressing up, in embankments for roads, flood banks, marginal banks, and guide banks etc., lead upto 50 m and lift upto 1.5 m :		
	2.3.1 All kinds of soil	cum	543.40
2.4	Deduct for not rolling with power roller of minimum 8 tonnes for banking excavated earth in layers not exceeding 20 cm in depth.	cum	4.40
2.5	Deduct for not watering the excavated earth for banking	cum	38.20
2.6	Earth work in excavation by mechanical means (Hydraulic excavator)/ manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge.		
	2.6.1 All kinds of soil	cum	205.45
2.7	Earth work in excavation by mechanical means (Hydraulic excavator)/ manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge.		
	2.7.1 Ordinary rock	cum	412.95
	2.7.2 Hard rock (requiring blasting)	cum	711.35
	2.7.3 Hard rock (blasting prohibited)	cum	1184.30
2.8	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m.		
	2.8.1 All kinds of soil.	cum	286.85

Code No.	Description	Unit	Rate ₹
2.21	Open timbering in case of shafts, wells, cesspits, manholes and the like including strutting and shoring complete (Measurements to be taken of the face area timbered):		
	2.21.1 Depth not exceeding 1.5 m	sqm	62.35
	2.21.2 Depth exceeding 1.5 m but not exceeding 3 m	sqm	74.95
	2.21.3 Depth exceeding 3 m but not exceeding 4.5 m	sqm	91.60
2.22	Open timbering over areas including strutting, shoring etc. complete. (Measurements to be taken of the face area timbered):		
	2.22.1 Depth not exceeding 1.5 m	sqm	42.40
	2.22.2 Depth exceeding 1.5 m but not exceeding 3 m	sqm	50.80
	2.22.3 Depth exceeding 3 m but not exceeding 4.5 m	sqm	64.30
2.23	Extra for planking and strutting in open timbering if required to be left permanently in position. (Face area of the timber permanently left to be measured).	sqm	822.05
2.24	Extra rates for quantities of works, executed:		
	2.24.1 In or under water and/or liquid mud, including pumping out water as required	metre depth	20%
	2.24.2 In or under foul position, including pumping out water as required	metre depth	25%
	Note for item no. 2.24:- The extra percentage rate is applicable in respect of each item but limited to quantities of work executed in these difficult conditions. The unit, namely, metre depth, to be considered for payment, shall be the depth measured from the sub soil water level up to the centre of gravity of the qty executed in difficult conditions. The depth shall be reckoned correct to 0.10 m, 0.05 m or more shall be taken as 0.10 m and less than 0.05 m ignored.		
2.25	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	cum	253.95
2.25(a)	Excavating, supplying and filling of local earth (including royalty) by mechanical transport upto a lead of 5km also including ramming and watering of the earth in layers not exceeding 20 cm in trenches, plinth, sides of foundation etc. complete.	cum	368.65
2.26	Extra for every additional lift of 1.5 m or part thereof in excavation / banking excavated or stacked materials.		
	2.26.1 All kinds of soil	cum	104.50
	2.26.2 Ordinary or hard rock	cum	187.40
2.27	Supplying and filling in plinth with sand under floors, including watering, ramming, consolidating and dressing complete.	cum	2161.20

4.0 CONCRETE WORK

Code No.	Description	Unit	Rate ₹
	CEMENT CONCRETE (CAST IN SITU)		
4.1	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level :		
4.1.2	1:1½:3 (1 Cement: 1½ coarse sand (zone-III) derived from natural sources : 3 graded stone aggregate 20 mm nominal size derived from natural sources)	cum	7783.65
4.1.2A	1:1.5:3 (1 Cement: 1.5 coarse sand (zone-III) including manufactured sand derived from Recycled Concrete Aggregate (RCA) upto 25% : 3 graded stone aggregate 20 mm nominal size Recycled Concrete Aggregate (RCA) upto 25%).	cum	7555.05
4.1.3	1:2:4 (1 cement : 2 coarse sand (zone-III) derived from natural sources : 4 graded stone aggregate 20 mm nominal size derived from natural sources)	cum	7365.15
4.1.3A	1:2:4 (1 cement : 2 coarse sand (zone-III) including manufactured sand derived from Recycled Concrete Aggregate (RCA) upto 25% : 4 graded stone aggregate 20 mm nominal size Recycled Concrete Aggregate (RCA) upto 25%)	cum	7124.50
4.1.4	1:2:4 (1 Cement : 2 coarse sand (zone-III) derived from natural sources : 4 graded stone aggregate 40 mm nominal size derived from natural sources)	cum	7226.95
4.1.5	1:3:6 (1 Cement : 3 coarse sand (zone-III) derived from natural sources : 6 graded stone aggregate 20 mm nominal size derived from natural sources)	cum	6833.40
4.1.5A	1:3:6 (1 Cement : 3 manufactured sand derived from Recycled Concrete Aggregate (RCA) : 6 graded stone aggregate 20 mm nominal size Recycled Concrete Aggregate (RCA))	cum	5815.05
4.1.5B	1:3:6 (1 cement : 3 manufactured sand derived from Recycled concrete Aggregate (RCA) : 6 graded stone aggregate 20 mm nominal size Recycled Aggregate (RA))	cum	5122.25
4.1.6	1:3:6 (1 Cement : 3 coarse sand (zone-III) derived from natural sources : 6 graded stone aggregate 40 mm nominal size derived from natural sources)	cum	6670.25
4.1.6A	1:3:6 (1 Cement : 3 manufactured sand derived from Recycled Concrete Aggregate (RCA) : 6 graded stone aggregate 40 mm nominal size Recycled Aggregate (RA))	cum	5059.85
4.1.8	1:4:8 (1 Cement : 4 coarse sand (zone-III) derived from natural sources : 8 graded stone aggregate 40 mm nominal size derived from natural sources)	cum	6326.05
4.1.8A	1:4:8 (1 cement : 4 manufactured sand derived from Recycled Concrete Aggregate (RCA) : 8 graded stone aggregate 40 mm nominal size Recycled Aggregate (RA)	cum	4715.60

5.0 REINFORCED CEMENT CONCRETE

Code No.	Description	Unit	Rate ₹
	CAST IN SITU		
5.1	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level :		
	5.1.2 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) derived from natural sources : 3 graded stone aggregate 20 mm nominal size de rived from natural sources)	cum	8364.20
	5.1.2A 1:1.5:3 (1 cement : 1.5 coarse sand(zone-III) incuding manu-factured sand derived from Recycled Concrete Aggregate (RCA) upto 20% : 3 graded stone aggregate 20 mm nominal size of Recycled Concrete Aggregate (RCA) upto 20%.	cum	8180.85
	5.1.3 1:2:4 (1 cement : 2 coarse sand (zone-III) derived from natural sources : 4 graded stone aggregate 20 mm nominal size de rived from natural sources)	cum	7945.65
	5.1.3A 1:2:4 (1 cement : 2 coarse sand incuding manufactured sand derived from Recycled Concrete Aggregate (RCA) upto 20% : 4 graded stone aggregate 20 mm nominal size of Recycled Con crete Aggregate (RCA) upto 20%).	cum	7752.70
5.2	Reinforced cement concrete work in walls (any thickness), including attached pilasters, buttresses, plinth and string courses, fillets, columns, pillars, piers, abutments, posts and struts etc. above plinth level up to floor five level, excluding cost of centering, shuttering, finishing and reinforcement :		
	5.2.2 1:1.5:3 (1 cement : 1.5 coarse sand(zone-III) derived from natu-ral sources : 3 graded stone aggregate 20 mm nominal size derived from natural sources)	cum	10185.05
	5.2.2A 1:1.5:3 (1 cement : 1.5 coarse sand incuding manufactured sand derived from Recycled Concrete Aggregate (RCA) upto 20% : 3 graded stone aggregate 20 mm nominal size Recycled Concrete Aggregate (RCA) upto 20%	cum	10001.70
5.3	Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases above plinth level up to floor five level, excluding the cost of centering, shuttering, finishing and reinforcement with 1:1.5:3 (1 cement : 1.5 coarse sand(zone-III) derived from natural sources : 3 graded stone aggregate 20 mm nominal size derived from natural sources).	cum	10719.30
5.3A	Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral staircases above plinth level up to floor five level excluding the cost of centering, shuttering, finishing and reinforcement, with 1:1.5:3 (1 cement : 1.5 coarse sand		

Code No.	Description	Unit	Rate ₹
5.20	Encasing rolled steel section in grillages with cement concrete 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) derived from natural sources : 3 graded stone aggregate 20 mm nominal size derived from natural sources) including centering and shuttering but, excluding cost of expanded metal and hangers.	cum	8874.65
5.20A	Encasing rolled steel section in grillages with cement concrete 1:1.5:3 (1 cement : 1.5 coarse sand incuding manufactured sand derived from Recycled Concrete Aggregate (RCA) upto 20% : 3 graded stone aggregate 20 mm nominal size Recycled Concrete Aggregate (RCA) upto 20%), including centering and shuttering but excluding cost of expanded metal and hangers.	cum	8691.35
5.21	Extra for providing and fixing expanded metal mesh of size 20x60 mm and strands 3.25 mm wide 1.6 mm thick weighing 3.64 kg per sqm for encasing of rolled steel sections in beams, columns and grillages, excluding cost of hangers.	sqm	448.80
	STEEL REINFORCEMENT		
5.22	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level.		
	5.22.1 Mild steel and Medium Tensile steel bars	kg	88.95
	5.22.2 Hard drawn steel wire	kg	87.50
	5.22.3 Cold twisted bars	kg	89.65
	5.22.4 Hot rolled deformed bars	kg	89.65
	5.22.5 Hard drawn steel wire fabric	kg	94.10
	5.22.6 Thermo-Mechanically Treated bars of grade Fe-500D or more.	kg	89.65
5.22A	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete above plinth level.		
	5.22A.1 Mild steel and Medium Tensile steel bars	kg	88.95
	5.22A.2 Hard drawn steel wire	kg	87.50
	5.22A.3 Cold twisted bars	kg	89.65
	5.22A.4 Hot rolled deformed bars	kg	89.65
	5.22A.5 Hard drawn steel wire fabric	kg	94.10
	5.22A.6 Thermo-Mechanically Treated bars of grade Fe-500D or more.	kg	89.65
5.22B	Steel reinforcement for R.C.C. work ready to use "cut and bend" rebars of approved make from factory/workshop to construction site including placing in position and binding all complete upto plinth level.		
	5.22B.1 Thermo-Mechanically Treated bars of grade Fe-500D or more.	kg	83.15
5.22C	Steel reinforcement for R.C.C. work ready to use "cut and bend" rebars of approved make from factory/workshop to construction site including placing in position and binding all complete above plinth level.		
	5.22C.1 Thermo-Mechanically Treated bars of grade Fe-500D or more.	kg	83.15

Code No.		Description	Unit	Rate ₹
	12.45.4	Fully Perforated Gypsum Plaster Board of size 1200 x 2400x12.5 mm having approx. 15 % perforated area with perforation size and pattern as approved by the Engineer-in-charge and as per manufacturer's specification, with all 4 side tapered and backed by acoustical tissue with NRC value not less than 0.60	sqm	1483.15
12.46		Providing and fixing to the inlet mouth of rain water pipe PTMT (an Engineering Thermoplastic) grating square (Slit) 150 mm square with a height of 8 mm and weighing not less than 100 gms.	each	72.00
12.47		Providing & fixing UV stabilised fiberglass reinforced plastic sheet roofing up to any pitch, including fixing with polymer coated 'J' or 'L' hooks, bolts & nuts 8mm dia. G.I plain/bitumen washers complete but excluding the cost of purlins, rafters, trusses etc. The sheets shall be manufactured out of 2400 TEX panel rovigs incorporating minimum 0.3% ultra-violet stabiliser in resin system under approximately 2400 psi and hot cured. They shall be of uniform pigmentation and thickness without air pockets and shall conform to IS 10192 and IS 12866.The sheets shall be opaque or translucent, clear or pigmented, textured or smooth as specified.		
	12.47.1	2 mm thick corrugated (2.5" or 4.2" or 6") or step-down (2" or 3" or 6") as specified	sqm	1179.25
	12.47.2	2 mm thick flat	sqm	1048.50
12.48		Providing & fixing on roof pressed clay tile (Mangalore tile) of 20 mm nominal thickness and of approved size and as per approved pattern on steel frame work complete (steel frame work to be paid separately).	sqm	346.65
12.49		Providing & laying on roof pressed clay tile ridge (Mangalore tile) of 20mm thickness and of approved pattern on steel frame work complete (steel frame work to be paid separately).	sqm	77.75
12.50		Providing and fixing precoated galvanised iron profile sheets (size, shape and pitch of corrugation as approved by Engineer-in-charge) 0.50 mm (+ 0.05 %) total coated thickness with zinc coating 120 grams per sqm as per IS: 277, in 240 mpa steel grade, 5-7 microns epoxy primer on both side of the sheet and polyester top coat 15-18 microns. Sheet should have protective guard film of 25 microns minimum to avoid scratches during transportation and should be supplied in single length upto 12 metre or as desired by Engineer-in-charge. The sheet shall be fixed using self drilling /self tapping screws of size (5.5x 55 mm) with EPDM seal, complete upto any pitch in horizontal/ vertical or curved surfaces, excluding the cost of purlins, rafters and trusses and including cutting to size and shape wherever required.	sqm	671.55
12.51		Providing and fixing precoated galvanised steel sheet roofing accessories 0.50 mm (+0.05 %) total coated thickness, Zinc coating 120 grams per sqm as per IS: 277, in 240 mpa steel grade, 5-7 microns epoxy primer on both side of the sheet and polyester top coat 15-18 microns using self drilling/ self tapping screws complete :		
	12.51.1	Ridges plain (500 - 600mm)	metre	450.60

10.0 STEEL WORK

Code No.	Description	Unit	Rate ₹
10.1	Structural steel work in single section, fixed with or without connecting plate, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete.	kg	93.05
10.2	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete.	kg	78.20
10.3	Providing and fixing in position collapsible steel shutters with vertical channels 20x10x2 mm and braced with flat iron diagonals 20x5 mm size, with top and bottom rail of T-iron 40x40x6 mm, with 40 mm dia steel pulleys, complete with bolts, nuts, locking arrangement, stoppers, handles, including applying a priming coat of approved steel primer.	sqm	9397.35
10.4	Providing and fixing 1 mm thick M.S. sheet sliding-shutters, with frame and diagonal braces of 40x40x6 mm angle iron, 3 mm M.S. gusset plates at the junctions and corners, 25 mm dia pulley, 40x40x6 mm angle and T- iron guide at the top and bottom respectively, including applying a priming coat of approved steel primer	sqm	5374.35
10.5	Providing and fixing 1mm thick M.S. sheet door with frame of 40x40x6 mm angle iron and 3 mm M.S. gusset plates at the junctions and corners, all necessary fittings complete, including applying a priming coat of approved steel primer.		
	10.5.1 Using M.S. angels 40x40x6 mm for diagonal braces	sqm	4781.15
	10.5.2 Using flats 30x6mm for diagonal braces and central cross piece	sqm	4615.15
10.6	Supplying and fixing rolling shutters of approved make, made of required size M.S. laths, interlocked together through their entire length and jointed together at the end by end locks, mounted on specially designed pipe shaft with brackets, side guides and arrangements for inside and outside locking with push and pull operation complete, including the cost of providing and fixing necessary 27.5 cm long wire springs manufactured from high tensile steel wire of adequate strength conforming to IS: 4454 - part 1 and M.S. top cover of required thickness for rolling shutters.		
	10.6.1 80x1.25 mm M.S. laths with 1.25 mm thick top cover	sqm	3008.80
	10.6.2 80x1.20 mm M.S. laths with 1.20 mm thick top cover	sqm	2868.30
	10.6.3 80x0.90 mm M.S. laths with 0.90 mm thick top cover	sqm	2718.90
10.7	Providing and fixing ball bearing for rolling shutters.	each	424.20
10.8	Extra for providing mechanical device chain and crank operation for operating rolling shutters.		
	10.8.1 Exceeding 10.00 sqm and upto 16.80 sqm in the area	sqm	1108.70
	10.8.2 Exceeding 16.80 sqm in area	sqm	1108.70
10.9	Extra for providing grilled rolling shutters manufactured out of 8 mm dia M.S. bar instead of laths as per design approved by Engineer-in- charge, (area of grill to be measured).	sqm	668.95

Code No.		Description	Unit	Rate ₹
13.43		Applying one coat of water thinnable cement primer of approved brand and manufacture on wall surface :		
	13.43.1	Water thinnable cement primer	sqm	64.45
		EXTERIOR FINISHING		
13.44		Finishing walls with water proofing cement paint of required shade :		
	13.44.1	New work (Two or more coats applied @ 3.84 kg/10 sqm)	sqm	97.60
13.45		Finishing walls with textured exterior paint of required shade :		
	13.45.1	New work (Two or more coats applied @ 3.28 ltr/10 sqm) over and including priming coat of exterior primer applied @ 2.20kg/10 sqm	sqm	245.00
13.46		Finishing walls with Acrylic Smooth exterior paint of required shade :		
	13.46.1	New work (Two or more coat applied @ 1.67 ltr/10 sqm over and including priming coat of exterior primer applied @ 2.20 kg/10 sqm)	sqm	166.85
13.47		Finishing walls with Premium Acrylic Smooth exterior paint with Silicone additives of required shade:		
	13.47.1	New work (Two or more coats applied @ 1.43 ltr/10 sqm over and including priming coat of exterior primer applied @ 2.20 kg/10 sqm)	sqm	162.35
13.48		Finishing with Deluxe Multi surface paint system for interiors and exteriors using Primer as per manufacturers specifications :		
	13.48.1	Two or more coats applied on walls @ 1.25 ltr/10 sqm over and including one coat of Special primer applied @ 0.75 ltr /10 sqm	sqm	158.95
	13.48.2	Painting wood work with Deluxe Multi Surface Paint of required shade. Two or more coat applied @ 0.90 ltr/10 sqm over an under coat of primer applied @0.75 ltr/10 sqm of approved brand and manufacture	sqm	144.90
	13.48.3	Painting Steel work with Deluxe Multi Surface Paint to give an even shade. Two or more coat applied @ 0.90 ltr/ 10 sqm over an under coat of primer applied @ 0.80 ltr/ 10 sqm of approved brand and manufacture	sqm	140.05
13.48A		Finishing walls with 100% Premium acrylic emulsion paint having VOC less than 50 gm/litre and UV resistance as per IS 15489:2004, Alkali & fungal resistance, dirt resistance exterior paint of required shade (Company Depot Tinted) with silicon additives.		
	13.48A.1	New work (Two or more coats applied @ 1.43 litre/ 10 sqm. Over and including priming coat of exterior primer applied @ 0.90 litre/10 sqm.	sqm	154.45
13.50		Applying priming coat:		
	13.50.1	With ready mixed pink or Grey primer of approved brand and manufacture on wood work (hard and soft wood)	sqm	61.45
	13.50.2	With ready mixed aluminium primer of approved brand and manufacture on resinous wood and plywood	sqm	62.95

12.0 ROOFING

Code No.		Description	Unit	Rate ₹
		SHEET ROOFING		
12.1		Providing corrugated G.S. sheet roofing including vertical / curved surface fixed with polymer coated J or L hooks, bolts and nuts 8 mm diameter with bitumen and G.I. limpet washers or with G.I. limpet washers filled with white lead, including a coat of approved steel primer and two coats of approved paint on overlapping of sheets complete (up to any pitch in horizontal/ vertical or curved surfaces), excluding the cost of purlins, rafters and trusses and including cutting to size and shape wherever required.		
	12.1.1	1.00 mm thick with zinc coating not less than 275 gm/m²	sqm	1320.35
	12.1.2	0.80 mm thick with zinc coating not less than 275 gm/m²	sqm	1135.45
	12.1.3	0.63 mm thick with zinc coating not less than 275 gm/ m²	sqm	978.00
12.2		Extra for straight cutting in C.G.S. sheet roofing for making opening of area exceeding 40 sq. decimeter for chimney stacks, sky light etc.:		
	12.2.1	1.00 mm thick	metre	95.60
	12.2.2	0.80 mm thick	metre	76.50
	12.2.3	0.63 mm thick	metre	76.50
12.3		Extra for circular cutting in C.G.S. sheet roofing for making opening of area exceeding 40 sq. decimeter:		
	12.3.1	1.00 mm thick	metre	552.85
	12.3.2	0.80 mm thick	metre	441.60
	12.3.3	0.63 mm thick	metre	441.60
12.4		Providing ridges or hips of width 60 cm overall width plain G.S. sheet fixed with polymer coated J or L hooks, bolts and nuts 8 mm dia G.I. limpet and bitumen washers complete.		
	12.4.1	0.80 mm thick with zinc coating not less than 275 gm/m²	metre	822.15
	12.4.2	0.63 mm thick with zinc coating not less than 275 gm/m²	metre	750.85
12.5		Providing valleys of 90 cm wide overall in plain G.S. sheet fixed with polymer coated J, or L hooks, bolts and nuts 8 mm dia G.I. limpet and bitumen washers complete :		
	12.5.1	1.60 mm thick with zinc coating not less than 350 gm/m²	metre	1370.40
12.6		Providing and fixing of 40 cm overall width plain G.S. sheet fixed with polymer coated J or L hooks, bolts and nuts, G.I. limpet and bitumen washer complete, bent to shape and fixed in wall with cement mortar 1:3 (1 cement : 3 coarse sand).		
	12.6.1	1.00 mm thick with zinc coating not less than 275 gm/m²	metre	700.20

Code No.			Description	Unit	Rate ₹
	17.35.2	75 mm diameter :			
		17.35.2.1	Sand cast iron S&S pipe as per IS: 1729	metre	931.55
		17.35.2.2	Centrifugally cast (spun) iron socketed pipe as per IS: 3989	metre	1042.10
		17.35.2.3	Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside IS:15905	metre	867.55
17.36	Providing and filling the joints with spun yarn, cement slurry and cement mortar 1:2 (1 cement : 2 fine sand) in S.C.I./ C.I. Pipes :				
	17.36.1	75 mm dia pipe		each	138.70
	17.36.2	100 mm dia pipe		each	163.45
17.37	Providing and fixing M.S. holder-bat clamps of approved design to Sand Cast iron/cast iron (spun) pipe embedded in and including cement concrete blocks 10x10x10 cm of 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), including cost of cutting holes and making good the walls etc. :				
	17.37.1	For 100 mm dia pipe		each	308.45
	17.37.2	For 75 mm dia pipe		each	304.45
17.38	Providing and fixing bend of required degree with access door, insertion rubber washer 3 mm thick, bolts and nuts complete.				
	17.38.1	100 mm dia			
		17.38.1.1	Sand cast iron S&S as per IS - 1729	each	530.70
		17.38.1.2	Sand cast iron S&S as per IS - 3989	each	597.60
		17.38.1.3	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905	each	550.80
	17.38.2	75 mm dia			
		17.38.2.1	Sand cast iron S&S as per IS - 1729	each	440.00
		17.38.2.2	Sand cast iron S&S as per IS- 3989	each	453.40
		17.38.2.3	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905	each	440.00
17.39	Providing and fixing plain bend of required degree.				
	17.39.1	100 mm dia			
		17.39.1.1	Sand cast iron S&S as per IS - 1729	each	412.95
		17.39.1.2	Sand cast iron S&S as per IS : 3989	each	439.75
		17.39.1.3	Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside IS:15905	each	346.05

14 Annexure – V Quotations

8/4/2021 Buy Unbranded Containerized Housing / Office Unit 6100 mm x C4067E 2440 mm (L x W) online | GeM

Containerized Housing

Home Land and Buildings and Structures and Thoroughfares Prefabricated buildings and structures Prefabricated emergency relief buildings and structures Containerized Housing / Office Unit

Unbranded Containerized Housing / Office Unit 6100 mm x C4067E 2440 mm (L x W)
NA
(PORTA CABIN 20 X 8 METAL ARC)

₹315,000.00

TRENDS

Price For : 1 pieces

MRP/Unit: ~~₹ 425,000.00~~
Offer Price/Unit: **₹ 315,000.00**

Availability: **4 In Stock**

Min. Qty. Per Consignee: 1

Product id: 5116877-50598080234
Country Of Origin: India
Local Content (MII): Not Declared

Sold by: **Resellers**

Reseller not verified by OEM

Catalogue not verified by OEM

VIEW SELLER DETAILS

8/4/2021 Buy Unbranded 3 - seater portable toilet 1143mm x 890mm x 1980mm with Sludge tank(Capacity 400 Ltrs) with 75mm outlet facility t...

Portable Toilet

Home Land and Buildings and Structures and Thoroughfares Portable buildings and structures Portable Commercial and industrial buildings and structures Portable Toilet

Unbranded 3 - seater portable toilet 1143mm x 890mm x 1980mm with Sludge tank(Capacity 400 Ltrs) with 75mm outlet facility through butterfly valve and hosepipe(for 2-seater and 3-seater)
NA
(UNBRANDED034)

₹24,777.00

TRENDS

Price For : 1 pieces

MRP/Unit: ~~₹ 312,000.00~~
Offer Price/Unit: **₹ 24,777.00**

Availability: **5 In Stock**

Min. Qty. Per Consignee: 3

Product id: 5116877-96759972846
Country Of Origin: India
Local Content (MII): Not Declared

Sold by: **Resellers**

Reseller not verified by OEM

Catalogue not verified by OEM

★★★★½ 4.64

View Sellers Details

Ask GeMmy

PRODUCT COMPARE PRODUCT HISTORY (2)


All India
Enter product / service to search
Search
Get Best Price
Decompost Culture, Grade Standard: Bio-Tech Grade
₹ 30/ Kg
Get Latest Price
Form
Powder
Grade Standard
Bio-Tech Grade
Specifications:
- Dose: 25-30 GM per 15 Litter of water
- Ingredients: Oligosaccharide, cinnamon, tagetes erected and garlic oil
Benzer Multitech India Private Limited
Call 08048602382
Quantity
kg
Contact Seller
Explore similar products
View all products in Composting Culture ›

TECHNO POWER ENGINEERING
Material Handling & Processing Equipments

To
Hathras Nagar Palika Parishad.
Hathras, Uttar Pradesh

Dear Sir,

With reference to our discussion regarding supply and erection of Equipment's for MSW processing. We would like to provide our quotations as under:

SUPPLY AND ERECTION OF MSW PROCESSING EQUIPMENTS (HSN CODE 8479)

Parameters	Units	Nos required	Rate (Rs)	Total Costs in Lakhs(Rs)
Machineries- 1 set				
Belt Conveyors (Roller Belts) along with supporting structure along with cabe tray and electrical panels				
Feeding Conveyor for Trommals (12.0 M long, 1.2 M wide))	Nos	2	960000	19.2
Discharge Conveyor for Trommals (10.0 M long, 1.0 M wide)	Nos	2	750000	15
Discharge Conveyor for Trommals (8.0 M long, 1.0 M wide)	Nos	4	600000	24
Feeding Conveyor for VADS (15.0 M long, 1.0 M wide))	Nos	1	1050000	10.5
Discharge Conveyor for VADS (7.0 M long, 0.8 M wide)	Nos	1	490000	4.9
Feeding Conveyor for Destoner (9.0 M long, 1.0 M wide))	Nos	1	630000	6.3
Discharge Conveyor for Destoner (7.0 M long, 0.8 M wide)	Nos	1	490000	4.9
Trommel Screen with Anti Clogging device				
Trommel Screen with 120 mm & 80 mm Hole, size 9.0 m LongX2.0 m dia	Nos	1	2500000	25
Trommel Screen with 35 mm & 16 mm Hole, size 9.0 m Long X 1.5 m dia	Nos	1	2200000	22
Volumetric Air Density Separators with Cyclone (10 TPH)	Nos	2	22,50,000	45
Destoner (10 TPH)	Nos	1	16,50,000	16.5
Magnetic Separator	Nos	1	5,50,000	5.5
Offline Shredder (10 TPH)		1	22,00,000	22
PLC & SCADA System	1 Set	1	1000000	10
Main Panel	Nos	1	4,50,000.0	4.5
Cables	LS	1	3,00,000.0	3
Total Cost of 1 Set of segregation Machines				238.3

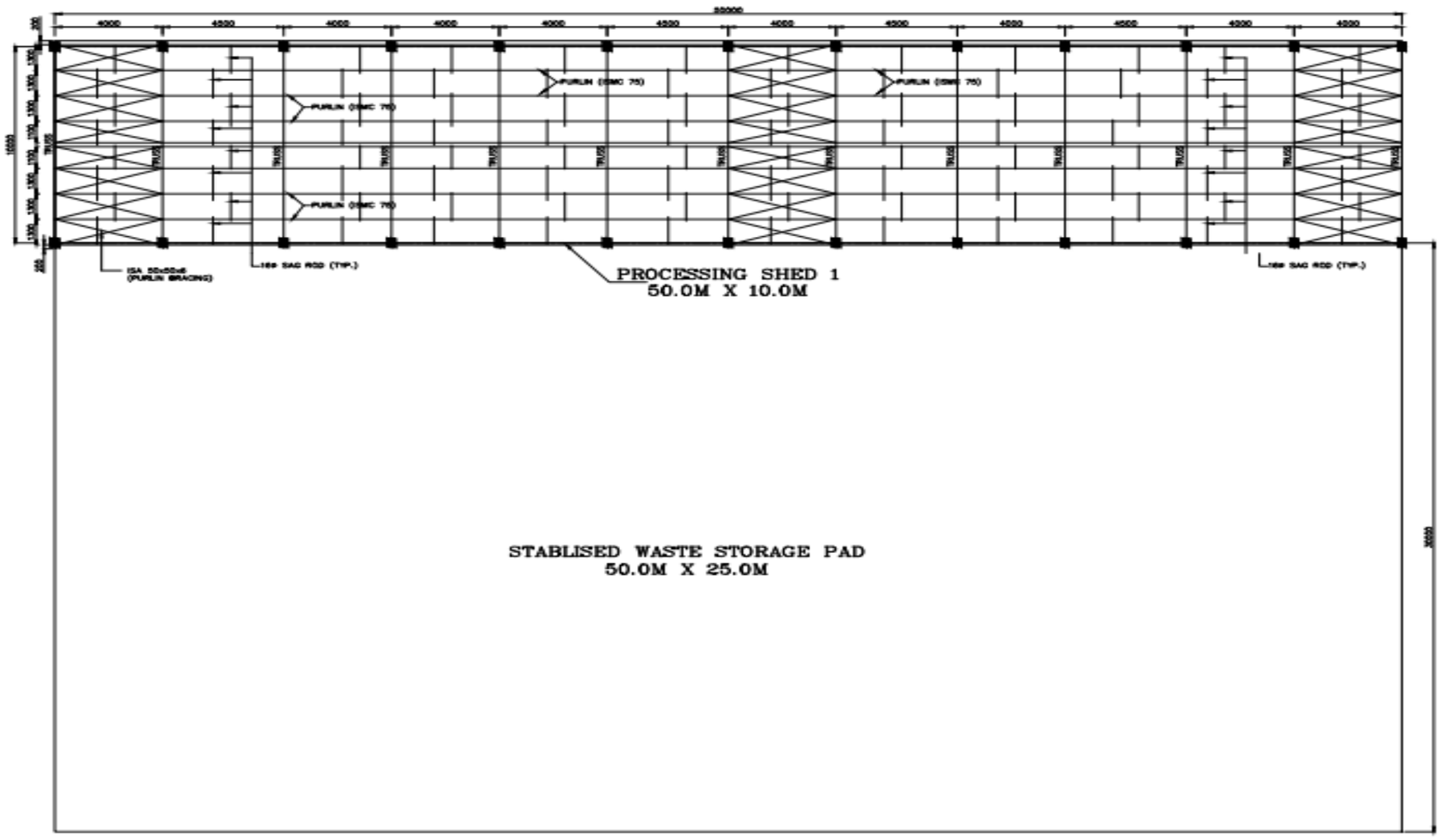
Prem Shanker Kumar
Techno Power Engineering

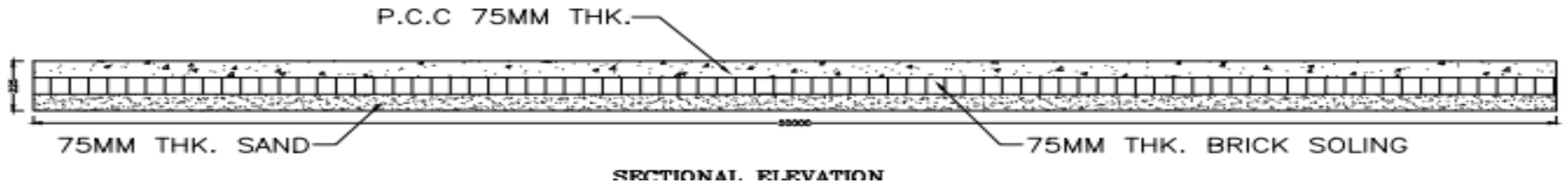
T & C

1. **All the civil work of machine foundation will be in your scope.**
2. **Unloading of machine at your site will be in your scope.**
3. **Delivery 10-12 weeks after confirmation of purchase order.**
4. **Payment 30% advance with purchasing order. 70% against Performa invoice.**

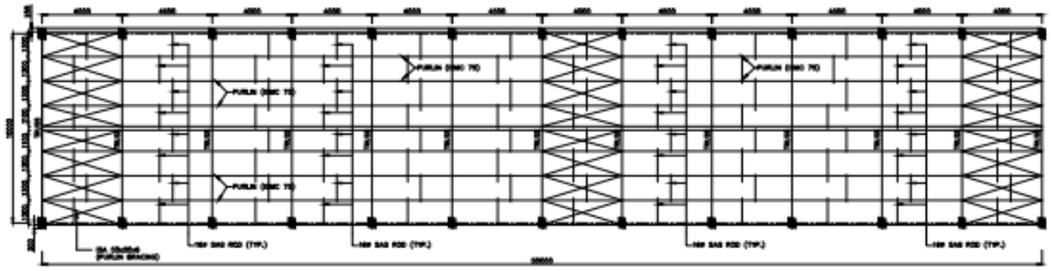
Regd. Office: 304, 3rd/ F, Block-D, 85, Aman Residency-II, Vatva, Ahmedabad-382440, Gujarat, India.
Mobile No. +91 9898456582
info@technopowereng.com I technopower56@gmail.com I www.technopowereng.com

15 Annexure – VI Layout Plan & Drawings

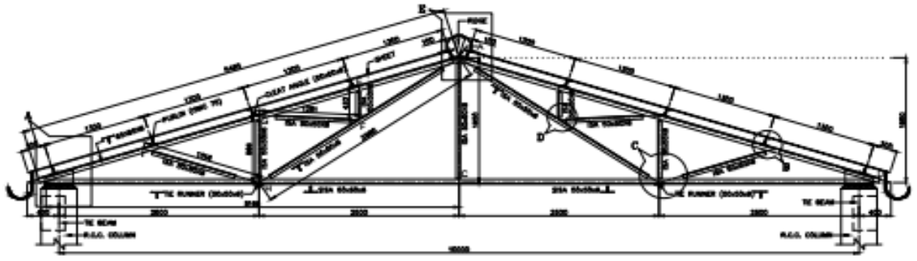




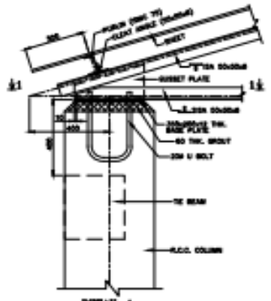
SECTIONAL ELEVATION



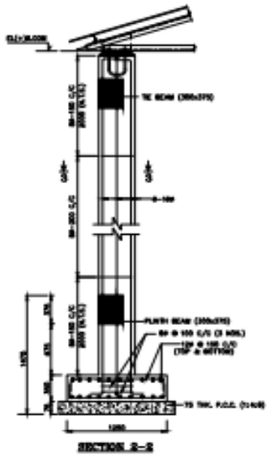
PLAN OF PROCESSING SHED 2 NOS



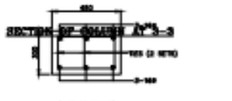
ELEVATION OF TRUSS

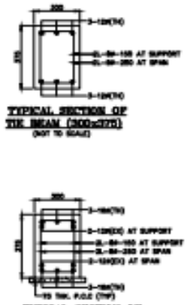


DETAIL A

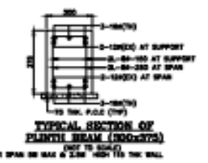


SECTION 2-2

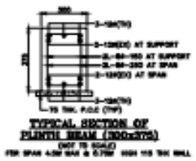




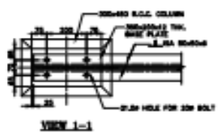
TYPICAL SECTION OF TIE BEAM (300x375)



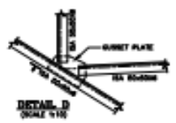
TYPICAL SECTION OF PLINTH BEAM (300x375)



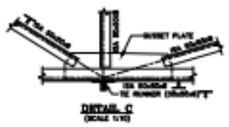
TYPICAL SECTION OF PLINTH BEAM (300x375)



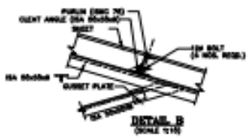
VIEW 1-1



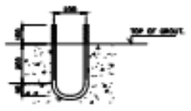
DETAIL D



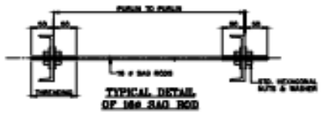
DETAIL C



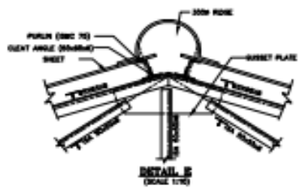
DETAIL B



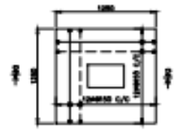
DETAIL OF 20ø U-BOLT



TYPICAL DETAIL OF 16ø RAG ROD



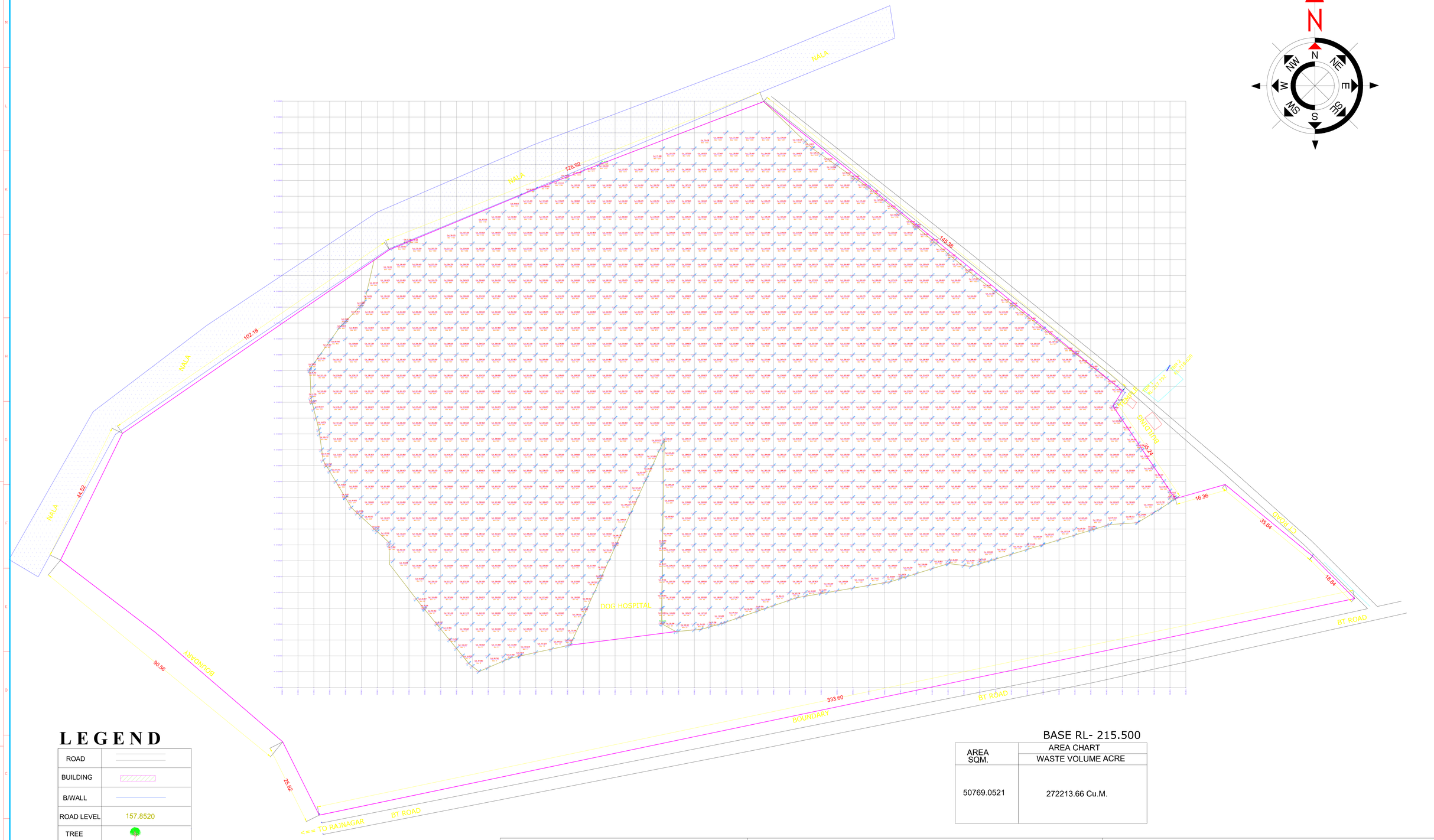
DETAIL E



TYPICAL FOUNDATION PLAN

NOTES:

1. ALL DIMENSIONS ARE IN MM .
2. THE GRADE OF CONCRETE SHALL BE M25/A25 AS PER IS:456-2000.
3. THE GRADE OF STEEL SHALL BE Fe 415 AS PER IS:1786-1985
4. CLEAR COVER TO OUTER MOST REINFORCEMENT SHALL BE AS
   COLUMN - 40MM BEAM - 30MM
   FOOTING - 50MM
5. THE SUBGRADE SHOULD BE COMPACTED PROPERLY.
6. DEVELOPMENT LENGTH (Ld) SHOULD NOT BE LESS THAN 50ø.
7. THE LAPPING LENGTH SHOULD NOT BE LESS THAN 50ø OF



BASE RL- 215.500

AREA SQM.	AREA CHART WASTE VOLUME ACRE
50769.0521	272213.66 Cu.M.

LEGEND

ROAD	
BUILDING	
B/WALL	
ROAD LEVEL	157.8520
TREE	
EP	EP
SAMAR	
TF	
DIMENTION	15.89

NOTES

1. ALL DIMENSIONS ARE IN MTR.
2. ALL LEVELS ARE IN MTR.

SCHEME:- LEGACY WASTE MANAGEMENT

DEPTT. :- GHAZIABAD NAGAR NIGAM

TITLE :

LAYOUT PLAN OF GHAZIABAD DUMP SITE

CONSULTANT :-

SCALE	DWG. NO.	REVISION
NTS	01	R-0