

- (9) If the approved mining plan requires modifications during the lease period, the lessee shall carry out such modifications and re-submit the modified mining plan to the Assistant Director or Deputy Director of Geology and Mining, as the case may be of the district concerned for approval.
- (10) The Assistant Director or Deputy Director of Geology and Mining as the case may be of the district concerned shall, within a period of ninety days from the date of receipt of the modified mining plan, convey his approval or disapproval to the lessee and in case of disapproval, he shall also convey the reasons for disapproving the said modified mining plan.
- (11) If no decision is conveyed on modified mining plan within the period stipulated, it shall be deemed to have been provisionally approved and such approval shall be subject to the final decision whenever communicated.

(10) Quarrying operations to be in accordance with mining plan:- (i) Every holder of a lease shall carry out the quarrying operation for minor mineral in accordance with the approved mining plan..

- (ii) If the mining operations are not carried out in accordance with the mining plan, the District Collector may order suspension of all quarrying operations and permit continuance of quarrying operations, by way of rectification to restore the conditions as may be necessary in the quarry as envisaged under the said mining plan.

(iii) Where quarrying operations for minor minerals other than granites have been undertaken before the commencement of these rules without approved mining plan, such existing holder of minor mineral leases shall submit the draft mining plan to the Assistant Director or Deputy Director of Geology and Mining, as case may be of the district concerned within ninety days from the date of commencement of these rules.

- (iv) The draft mining plan submitted by the applicant shall be scrutinized and accorded approval or returned to the applicant for modification and resubmission within a period of ninety days from the date of receipt of the mining plan.
- (v) If no decision is conveyed to the applicant within the stipulated period, the draft mining plan or the modified draft mining plan furnished by the applicant shall be deemed to have been provisionally approved and such approval shall be subject to the final decision whenever communicated.
- (vi) When the existing holders of minor mineral leases other than granite failed to submit the approved mining plan within the stipulated period, the District Collector shall cancel the minor mineral leases after giving an opportunity of personal hearing.

"42. Submission of environment clearance for the grant of quarry lease for minor minerals including Granite" :- (i) The approved mining plan shall be forwarded to the applicant for obtaining environment clearance

from the State Level Environment Impact Assessment Authority of the Ministry of Environment and Forests, as the case may be.

- (ii) On submission of approved mining plan and environment clearance from the said authorities, the Government or the District Collector, as the case may be, shall grant the quarry lease.
- (iii) Where quarrying operations for minor minerals including granites have been undertaken before the commencement of these rules without environment clearance, such holder of minor mineral including granite leases shall submit the environment clearance within one hundred and eighty days from the date of commencement of these rules.
- (iv) When the existing holders of minor mineral leases including granite failed, to submit the environment clearance within the stipulated period, the District Collector or the Government, as the case may be shall cancel the lease after giving an opportunity of Personnel hearing.

(BY ORDER OF THE GOVERNOR)

C.V. SANKAR
 ADDITIONAL CHIEF SECRETARY TO GOVERNMENT

To

The Works Manager, Government Central Press, Chennai-79.

The Director, Tamil Development Culture and Religious Endowment (Translation) Dept., Chennai-9.

The Commissioner of Geology and Mining, Guindy, Chennai-32.

The Chairman and Managing Director, Tamilnadu Minerals Ltd, Chennai-5.

The Principal Chief Conservator of Forest, Chennai-6.

The Special Commissioner of Town & Country Planning, Chennai-2.

All District Forest Officers, through PCCF, Chennai-6.

All District Collectors

The Principal Secretary, Public Works Department, Chennai-9.

Copy to:

The Law Department, Chennai-9.

The Public Works Department, Chennai-9.

All Sections in Mines wing, Industries Department, Chennai-9.

The Industries (QP.II) Department, Chennai-9.

SF/SC

Forwarded / By order /

Section Officer

**ABSTRACT**

Industries - Mines and Minerals - Sand quarries - Usage of machinery - Various orders issued from time to time for usage of poclains in Sand Mining - Guidelines issued by the Government of India - Earlier orders superceded - Orders - Issued.

Industries (MMC.1) Department

G.O.(20) No. 21

Dated: 02.06.2017

தேய்வநிலைப்பி - கலவரம் 19.

திருவள்ளூர் ஆணை - 2048

Read:

1. G.O.(D)No.7, Industries (MMC.2) Department, dated 11.01.2011.
2. G.O.(D)No.39, Industries (MMC.1) Department, dated 01.02.2011.
3. G.O.(D)No.67, Industries (MMC.2) Department, dated 11.03.2011.
4. G.O.(D)No.22, Industries (MMC.2) Department, dated 20.02.2014.
5. G.O.(D)No.110, Industries (MMC.2) Department, dated 17.06.2015.
6. From the Government of India, Ministry of Environment, Forest and Climate Change, notification S.O.141(E), dated 15.1.2016.
7. From the Engineer-in-Chief, WRD, Public Works Department, Letter No.S7(3)/ 62535/OT2/2003, dated 26.05.2017.
8. From the Commissioner of Geology and Mining, Letter No.8828/MM6/2012, dated 29.5.2017.
9. Opinion of the Advocate General of Tamil Nadu, dated 31.5.2017.

ORDER:

In the Government Orders 1st to 4th read above, orders have been issued permitting the District Collectors for restricted and judicious use of minimum number of poclains and not more than two poclains in each of the sand quarries in the State (other than Palar and Thamirabarani Rivers).

2. In the Government Order 5th read above, based on the recommendation of the Committee headed by Thiru Rajesh Lakhoni, IAS., the Government reiterated the instructions regarding usage of poclains already issued in the Government orders 1st to 4th read above.

3. The Ministry of Environment, Forest and Climate Change, Government of India in its notification 6th read above issued under Sec.3(2) of the Environment Protection Act had stated that the Ministry of Environment and

Forest and Climate Change, in consultation with the State Governments, has prepared guidelines on Sustainable Sand Mining dealing with the provisions on environmental clearance. In terms of the said notification, the Ministry of Environment and Forest, has issued Sustainable Sand Mining Guidelines, 2016, in which it is stated that depending upon the location, thickness of sand, deposition, Agricultural land/river bed, the method of mining may be manual, semi-mechanized or mechanized. However, manual method of mining shall be preferred over any other method.

4. In the letter 7th read above, the Public Works Department has sent a proposal to the Government for increase in the usage of poclains upto 5 nos. per quarry.

5. In the letter 8th read above, the Commissioner of Geology and Mining has informed, among others, that the State Level Environmental Impact Assessment Authority (SEIAA) and Environment Department are the competent authorities to decide the usage of machineries in the sand quarries without damage to the Ecology and Environment.

6. The Government carefully examined the issue in consultation with the Advocate General of Tamil Nadu and the Government have decided to supercede the earlier orders in the Government orders 1st to 5th read above which were issued prior to Ministry of Environment, Forest and Climate Change notification vide reference 6th cited and to direct the Public Works Department to move State Level Environmental Impact Assessment Authority (SEIAA) to permit more number of poclains taking into account the factors mentioned in the Sustainable Sand Mining Guidelines, 2016 issued by the Government of India.

7. Accordingly, the Government also direct that the Public Works Department may move the SEIAA on a case to case basis to permit more number of poclains for usage in sand quarries.

(BY ORDER OF THE GOVERNOR)

ATULYA MISRA

PRINCIPAL SECRETARY TO GOVERNMENT

To

The Principal Secretary to Government, Public Works Department, Chennai -9.

The Principal Secretary to Government, Environment and Forest, Chennai -9.

The Chairman, State Level Environmental Impact Assessment Authority (SEIAA), Chennai-35.

The Commissioner of Geology and Mining Guindy, Chennai-32.

The Engineer-In-Chief, WRD, Public Works Department, Chennai-5.

All the District Collectors.

Copy to:

O/o. the Hon'ble Minister (Industries), Chennai-9.

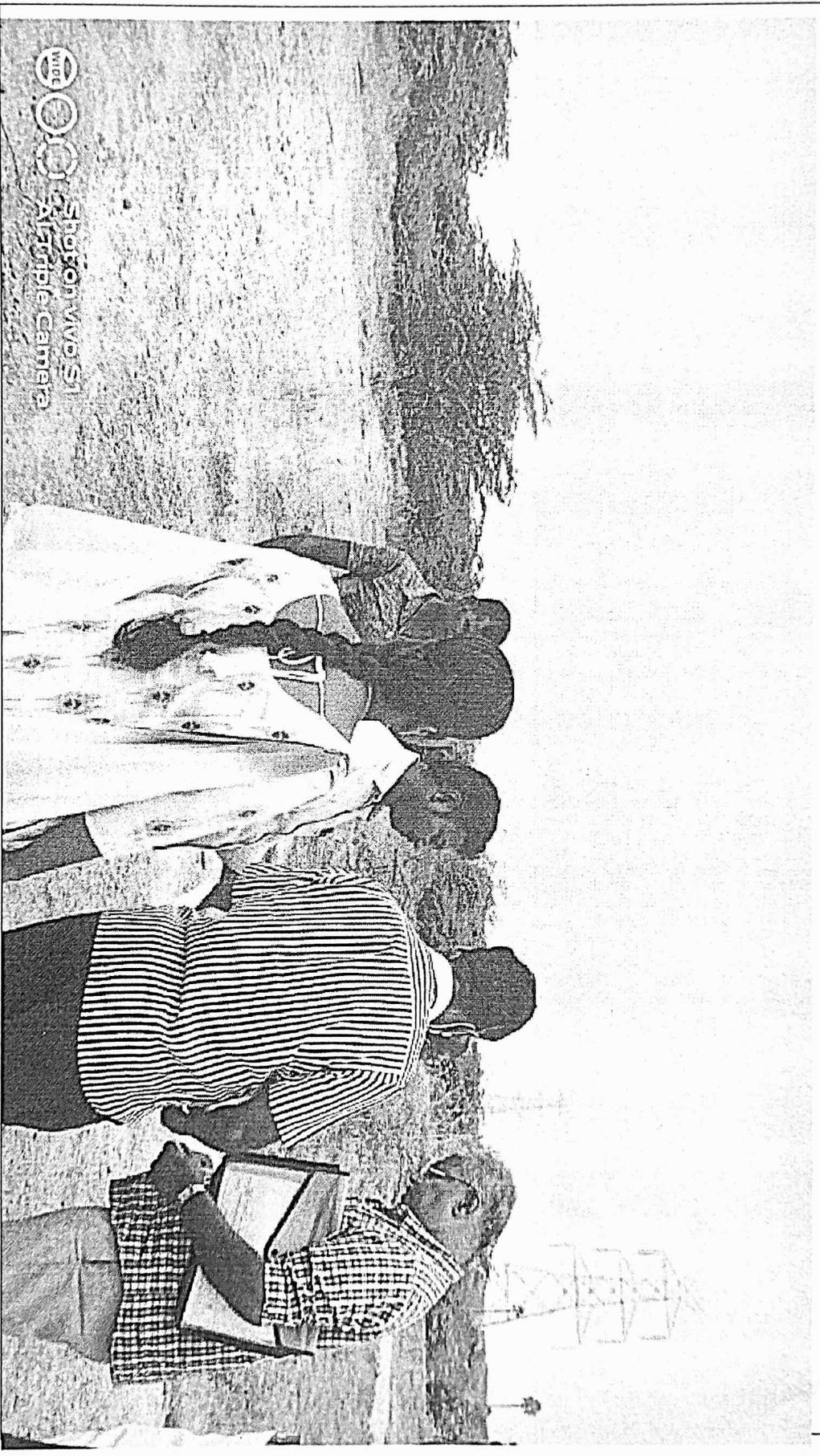
The Law Department, Chennai-9.

Sf/sc.

FINDING DEPTH OF SAND DEPOSIT BY TRIAL PIT

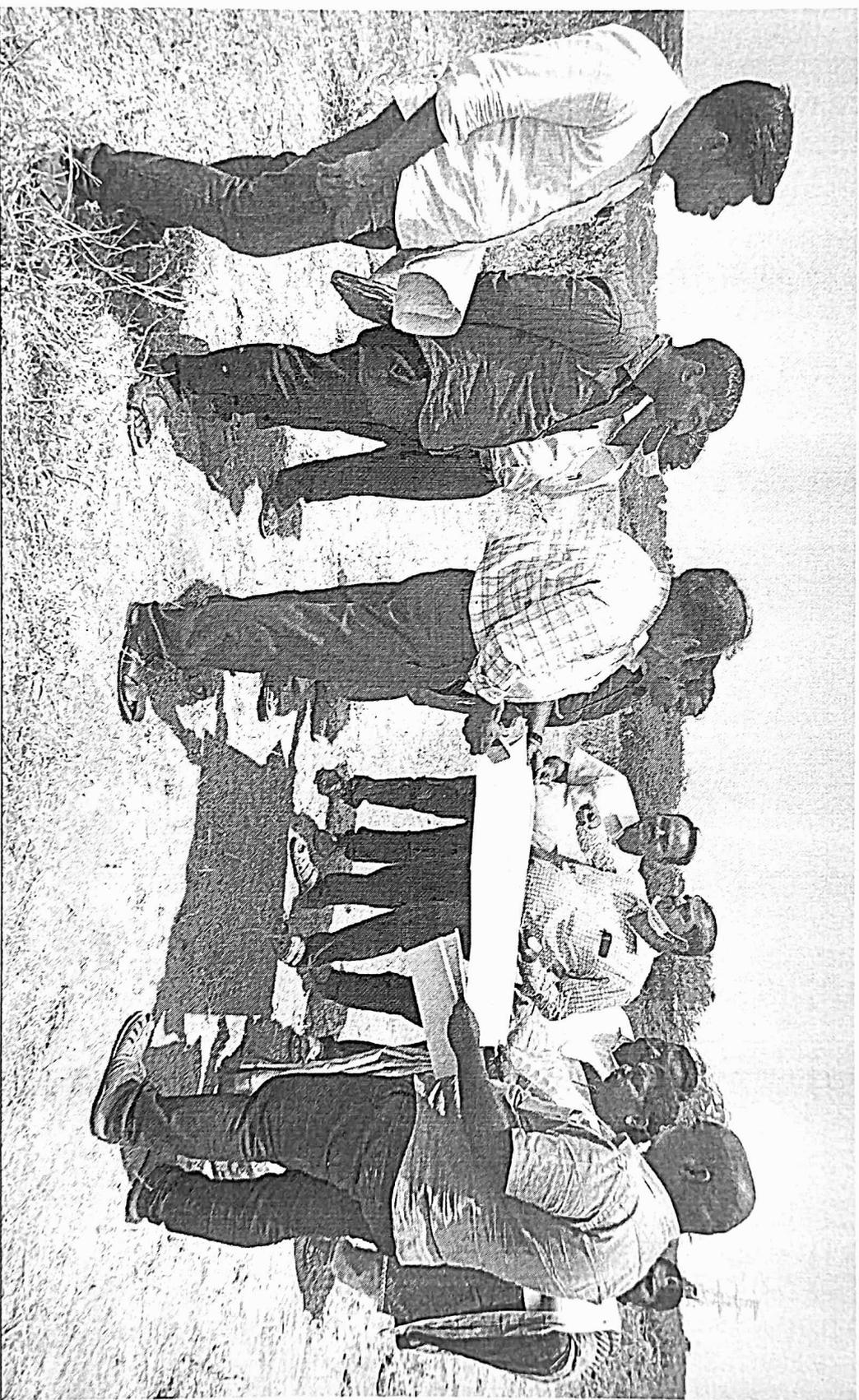


SITE INSPECTION BY EXECUTIVE ENGINEER, M & M DIVISION, MADURAI

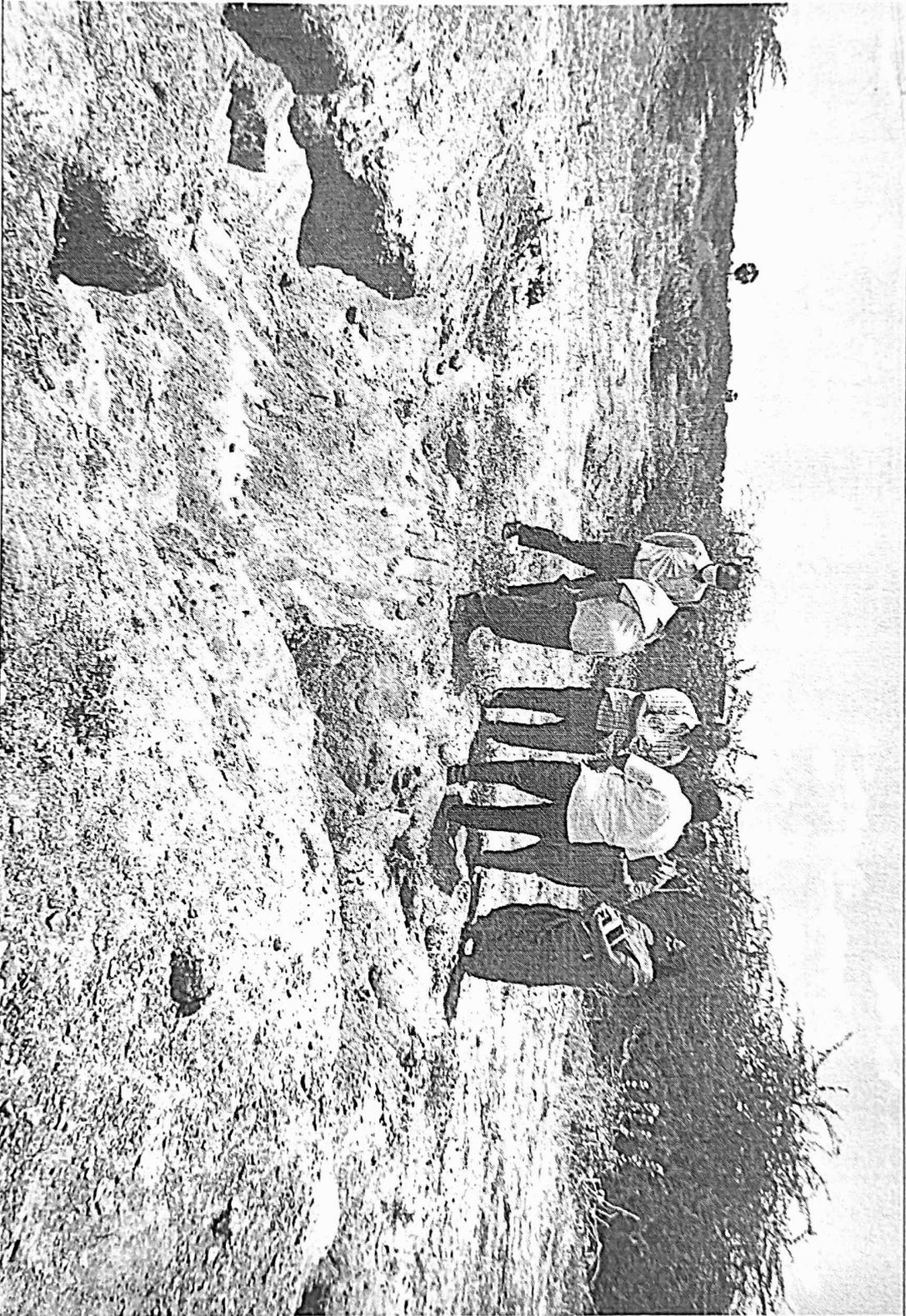


Shogon VDS1
Wide Angle Camera

JOINT INSPECTION BY LINE DEPARTMENT OFFICIALS



SITE INSPECTION BY SEIAA MEMBERS



**SITE INSPECTION BY DISTRICT ENVIRONMENTAL ENGINEER,
VIRUDHUNAGAR**



MINING PLAN

INCLUDING ENVIRONMENT MANAGEMENT PLAN

FOR SAND QUARRY IN VAIPPARU RIVER, S.F.NO: 1095(P),
EXTENT: 4.95.50 HA, IN NENMENI VILLAGE, SATTUR TALUK,
VIRUDHUNAGAR DISTRICT, TAMIL NADU.

AS PER SAND MINING GUIDELINES, 2020. & Rule 41 & 42 of TNMMCR,
1959 AND AMENDMENT

APPLICANT

THE EXECUTIVE ENGINEER,
WATER RESOURCES ORGANIZATION,
MINING AND MONITORING DIVISION MADURAI, TN.



PREPARED BY

AADHI BOOMI MINING AND ENVIRO TECH (P) LTD.,
ACCREDITED CONSULTANT ORGANIZATION (ACO)

3/216, K.S.V. Nagar, Narasothipatti, Salem-636 004
Phone (0427)-2444297, Cell: 98427 29655, suriyakumarsemban@gmail.com,
abmenvirotech@gmail.com, Website: www.abmenvirotech.com

APRIL - 2022

From

Thiru.T.Selva sekar, M.Sc.,
Assistant Director,
Geology and Mining,
Virudhunagar.

To

The Executive Engineer,
WRD,
Mining and Monitoring Division,
Madurai.

Rc.No.KV1/347/2022, Dated: 02.05.2022.

Sir,

Sub: Mines and Minerals – Minor Mineral – Sand quarry
- Virudhunagar District – Sattur Taluk – Nenmeni
Village – River Vaipparu - S.F.No:1095 – Over an
extent of 4.95.50 Hectares – Permission requested
by Executive Engineer, WRD Mining and
Monitoring Division – Precise area communicated
– Mining plan submitted for approval - Approved -
regarding.

- Ref: 1. Rule 38-A of Tamil Nadu Minor Mineral
Concession Rules, 1959
2. The Executive Engineer, WRD, Mining and
Monitoring Division, Madurai letter letter
No. 26M/செள.12-29/Nenmeni/2022
Dated.07.03.2022
3. Joint Inspection Report dated: 18.03.2022.
4. Precise area communication letter in RC
No.KV1/347/2022 Dated: 23.03.2022.
5. Other connected records.

The Executive Engineer, WRD, Mining and Monitoring Division,
Madurai has submitted a proposal requesting sand quarry permission in
S.F.No:1095 over an extent of 4.95.50 Hects in River Vaipparu of Nenmeni
Village, Sattur Taluk, Virudhunagar District vide reference 2nd cited.

2. Based on the recommendations of the joint inspection carried out
by the Revenue Divisional officer Sattur and others, the request of Executive
Engineer WRD, Mining and Monitoring Division, Madurai had been
considered and the Precise area has been communicated to the applicant
under Rule 41 of TNMCR 1959 with a direction to produce Mining Plan and

Environmental Clearance obtained from the Authority concerned for grant of permission for Quarrying sand in the subject area vide reference 4th cited.

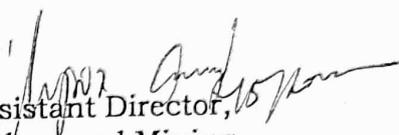
3. As requested the Executive Engineer, WRD., Mining and Monitoring Division, Madurai has submitted two copies of draft Mining Plan prepared by S.Suriyakumar, M.Sc., M.Phil. (Geo), EIA Coordinator (Mining), Accredited Consultant Organization, Reg.No: NABET/EIA/2124/RA-0228, Salem. The draft Mining Plan has been examined and verified with the provisions laid down in Rule 41 & 42 of TNMMCR 1959. Further it is revealed that the Mining Plan and also the plates had been prepared as per norms by providing necessary safety distance to the river bunds and other structures available in the precise area.

4. In exercise of the powers conferred in the Rules 41& 42 of Tamilnadu Minor Mineral Concession Rules 1959, the above said Mining Plan is here by approved subject to the following conditions:-

- i) That the mining plan is approved without prejudice to any other laws applicable to the quarry / area from time to time made by the Central Government, State Government or any other authority.
- ii) That the approval of the mining plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development & Regulation) Act 1957, or any other connected laws including Forest (Conservation) Act 1980, Forest Conservation Rules, 1981, Environment Protection Act, 1980, Indian Explosives Act, 1884 (Central Act IV of 1884) and the rules made there under and the Tamil Nadu Minor Mineral Concession Rules, 1959.
- iii) That the mining plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.
- iv) That the approval of mining plan does not confer any rights for the renewal of quarry lease.

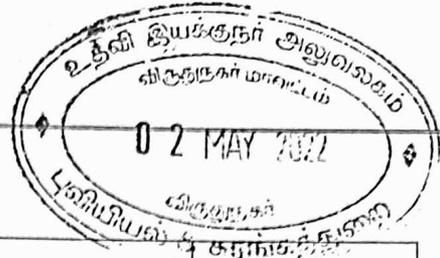
- v) The approval is valid up to the subsistence of the lease period only.
- vi) The Executive Engineer, WRD, Mining and Monitoring Division, Madurai is requested to submit the application in Form-I as prescribed by the MOEF along with the approved Mining Plan to the State Environment Impact Assessment Authority to issue Environment Clearance.

Encl: Approved Mining Plan


Assistant Director,
Geology and Mining
Virudhunagar.

Copy to :

1. The Chairman, State Level Environment Impact Assessment Authority, Chennai.
2. The Commissioner, Geology and Mining, Guindy, Chennai

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(a)

LIST OF ANNEXURES

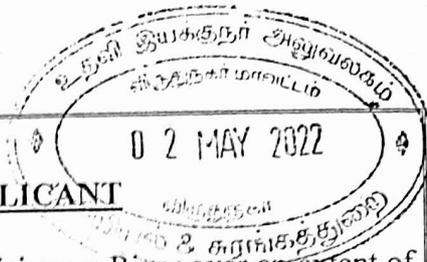
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(i)



CONSENT LETTER FROM THE APPLICANT

Mining Plan in respect of the proposed sand Quarry in Vaipparu River over an extent of 4.95.5 Hectares in S.F. No. 1095(P), Nenmeni Village, Sattur Taluk, Virudhunagar District, Tamil Nadu State has been prepared by Shri S.Suriyakumar, EIA Coordinator (Mining) of Accredited Consultant Organization, Aadhi Boomi Mining and Enviro tech Pvt Ltd., Salem bearing Reg. No.NABET/EIA/2124/RA-0228.

I request the Asst. Director of Dept. of Geology and Mining, Virudhunagar to make further correspondence regarding modifications of the mining plan with the said consultant on this following Address,

S.SURIYAKUMAR,

M.Sc., M.Phil. (Geo), F.C.C. (Min), PGDBA, PGDIPC

EIA Coordinator (Mining)

Accredited Consultant Organization

Reg. No. NABET/EIA/2124/RA-0228.

3/216,K.S.V.Nagar,Narasothipatti,

Alagapuram Post, Salem - 636 004.

Phone (0427) 2440446, Cell: 98427 29655

I hereby under take that all modifications so made in the Mining Plan by the Accredited Consultant Organization(ACO) may be deemed to have been made with my knowledge and consent and shall be acceptable to me and binding on me in all respects.

[Signature] 18/4/22
Assistant Engineer, PWD/WRD
Section - II
Mining and Monitoring Sub Division
Virudhunagar

[Signature] 18/4/2022
ASSISTANT ENGINEER P.W.D.M.R.
MINING & MONITORING SECTION - III
VIRUDHUNAGAR - 626 001.

[Signature] 18/4/22
ASSISTANT ENGINEER P.W.D.M.R.D
MINING & MONITORING SECTION - IV
VIRUDHUNAGAR - 626 001.

[Signature] 18/4/22
Assistant Executive Engineer, PWD/WRD
Mining and Monitoring Subdivision,
Virudhunagar

Place: Madurai

Date:

Signature of the Applicant

[Signature] 21/4/22
Executive Engineer PWD/WRD
Mining and Monitoring Division
Madurai - 625 002

(ii)



THE EXECUTIVE ENGINEER
Water Resource Organization,
Mining and Monitoring Division,
Madurai.
Tamil Nadu.

DECLARATION OF MINE OWNER

Mining Plan in respect of proposed Sand Quarry in Vaipparu River over an extent of 4.95.50 Hectares, S.F.No. 1095(P), Nenmeni Village, Sattur Taluk, Virudhunagar District, Tamil Nadu has been prepared with my consultation and I have understood the contents and agree to implement the same in accordance with the Tamil Nadu Minor Minerals Concession Rules, 1959 and Enforcement and Monitoring of sand Mining Guidelines, 2020.

[Signature]
18/4/22
Assistant Engineer, PWD/WRD
Section - II
Mining and Monitoring Sub Division
Virudhunagar.

[Signature]
18/4/22
ASSISTANT ENGINEER P.W.D.W.R.L
MINING & MONITORING SECTION - III
VIRUDHUNAGAR - 626 001.

[Signature]
18/4/22
ASSISTANT ENGINEER P.W.D.W.R.D
MINING & MONITORING SECTION - IV
VIRUDHUNAGAR - 626 001.

[Signature]
18/4/22
Assistant Executive Engineer, PWD/WRD
Mining and Monitoring Subdivision,
Virudhunagar

Place: Madurai

Date:

This Mining is approved based on guidelines/ instructions issued in the CGM, Letter No.3868/LC/2012 dated 19-11-2012 and incorporation of the particulars specified in the letter Roc.No. KY.1.347/2022 Dated 02/05/2022 of the Deputy Director of Geology and Mining, Virudhunagar and subject to further fulfillment of the conditions laid down under rule 41,42 of Tamil Nadu Mineral Concession Rules 1959

Signature of the Applicant

[Signature]
Executive Engineer PWD/WRD
Mining and Monitoring Division
Madurai - 625 002
[Signature]
27/4/22

[Signature]
Assistant Director of Geology & Mining
Virudhunagar

This Mining Plan is approved Subject to the conditions / Stipulation Indicated in the Mining Plan Approval
[Signature]
Letter Roc. No. KY.1.347/2022 Dated 02/05/2022

(iii)

S.SURIYAKUMAR,
 M.Sc., M.Phil. (Geo), F.C.C. (Min), PGDBA, PGDIPC,
 EIA Coordinator (Mining)
 Accredited Consultant Organization
 Reg. No.NABET/EIA/2124/RA-0228.
 3/216,K.S.V.Nagar, Narasothipatti, Salem - 636 004.
 Email:suriyakumarsemban@gmail.com,
 Phone: 9842729655



CERTIFICATE

This is to certify that the provisions of Tamil Nadu Minor Minerals Concession Rules, 1959 and Enforcement and Monitoring of sand Mining Guidelines, 2020 have been observed in the mining Plan for Sand Quarry in Vaipparu River over an extent of 4.95.50 Hectares, S.F.No. 1095(P), Nenmeni Village, Sattur Taluk, Virudhunagar District, Tamil Nadu State applied by the Executive Engineer, Water Resource Organization, Mining and Monitoring Division, Madurai for fresh quarry lease.

Wherever specific permissions/exemptions/relaxations or approvals are required, the applicant will approach the concerned authorities of State and Central Governments for granting such permissions etc.

Certified

Place: Salem

Date:

S. Suriyakumar

Signature of EIA Coordinator (Mining) - ACO

S. SURIYAKUMAR
 EIA coordinator (mining)
 NABET accredited consultant
 Reg. No. NABET/EIA/2124/RA-0228

(iv)

S.SURIYAKUMAR,

M.Sc., M.Phil. (Geo), F.C.C. (Min), PGDBA, DIPC.

EIA Coordinator (Mining)

ACO:AadhiBoomi Mining and EnvirotechPvtLtd.,Salem

Reg. No.NABET/EIA/2124/RA-0228.

3/216, K.S.V.Nagar, Narasothipatti, Salem - 636 004.

Email:suriyakumarsemban@gmail.com,

Phone: 9842729655

**CERTIFICATE**

Certified that in preparation of Mining Plan with respect to the proposed Sand quarry in Vaipparu River over an extent of 4.95.50 Hectares, S.F.No. 1095(P), Nenmeni Village, Sattur Taluk, Virudhunagar District, Tamil Nadu for the Executive Engineer, Water Resource Organization, Mining and Monitoring Division, Madurai covers all the provisions of Enforcement and Monitoring of sand Mining Guidelines, 2020, Mines Act, Rules, Regulations etc. made there under and whenever specific permissions are required. the applicant will approach the Director of Mining safety, Chennai. The standards prescribed by DGMS in respect of Miners Health will be strictly implemented.

Place: Salem

Date:

Certified

Signature of EIA Coordinator (Mining) - ACO

S. SURIYAKUMAR

EIA coordinator (mining)

NABET accredited consultant

Reg. No. NABET/EIA/2124/RA-0228



QUALITY COUNCIL
OF INDIA
Coating an Ecosystem for Quality



National Accreditation Board
for Education and Training

NABET

Certificate of Accreditation

Aadhi Boomi Mining and Enviro Tech P Ltd, Salem

3/216, K.S.V.Nagar, Narasothipatti, Alagapuram Post, Salem - 636004, Tamil Nadu

The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals- opencast only	1	1 (a) (i)	A
2	River Valley projects	3	1 (c)	A
3	Mineral beneficiation	7	2 (b)	A
4	Cement plants	9	3 (b)	A
5	Highways	34	7 (f)	B
6	Building and construction projects	38	8 (a)	B
7	Glass and Ceramic Industry	40 (iv)	-	A

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated December 17, 2021 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/22/2240 dated Feb 10, 2022. The accreditation needs to be renewed before the expiry date by Aadhi Boomi Mining and Enviro Tech P Ltd, Salem following due process of assessment.

Sr. Director, NABET
Dated: Feb 10, 2022

Certificate No.
NABET/EIA/2124/RA 0228

Valid up to
October 22, 2024

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.

MINING PLAN

INCLUDING ENVIRONMENT MANAGEMENT PLAN

FOR PROPOSED MECHANISED SAND QUARRY IN VAIPPARU RIVER OVER AN
EXTENT OF 4.95.5 HA IN S.F.NO.1095 (P) IN NENMENI VILLAGE, SATTUR TALUK,
VIRUDHUNAGAR DISTRICT, TAMIL NADU

“(As Per “ENFORCEMENT & MONITORING GUIDELINES FOR SAND MINING-2020” &
RULE 41 OF TNMMCR, 1959 AND AMENDED VIDE G.O. (MS). NO. 79, INDUSTRIES
(MMC1) DEPARTMENT DATED 06.04.2015)”

EXECUTIVE SUMMARY

1. Drone and Photogrammetry for aerial surveying of sand quarrying has been introduced to utilize this new technology, other than their conventional ground measurements with Total Station and DGPS as per the Sand Mining Guidelines, 2020. Several flight lines covering core area (Lease Area) and buffer of 100m on all direction, river courses study of 1km upstream and 1km downstream data was captured with high resolution camera and its ground controlled points are processing by PPK (Post Processing Kinematic) to what we achieved to complete about 4.95.50 Ha of lease area and 50 hectares buffer polygon in terms of geo-referenced point cloud, orthophoto mosaics, digital elevation model, contour lines, vector line map and 3D images like DTM. Estimation of reserves, stock volume and field measurements using software.
2. The **EXECUTIVE ENGINEER**, Water Resources Organization, Mining and Monitoring Division, Madurai has applied for sand Quarrying lease in Vaipparu River over an extent of 4.95.5 Hectares in S.F. No.1095(P), Nenmeni Village, Sattur Taluk, Virudhunagar District, Tamil Nadu.
3. The District Collector, Virudhunagar has directed the applicant vide his precise area communication letter **Rc.No.KV1/347 /2022, dated 23.03.2022** to get approved Mining plan and Environmental Clearance from the state Environmental Impact Assessment Authority (SEIAA) for grant of Sand Quarry in Vaipparu river, S.F. No.1095(P), Nenmeni Village, Sattur Taluk, Virudhunagar District, Tamil Nadu for a period of **Six Months**.
4. Tamil Nadu Water Resources Organization creates, maintains and protects all irrigation systems including the rivers. Periodical maintenance including de-silting of the drains/river is carried out to maintain the functional efficiency including the carrying capacity of the river. But in rivers flood protection works are carried out by increasing top level of bund and protecting

the sides of bund with revetment. The de-silting was never carried out in river due to the cost constraints. Therefore, prolonged siltation for decades and more, the level of the floor of river bed has increased and reduced the carrying capacity. Whenever floods and consequent damages occurred, it was resorted to increase the bund level to restore the carrying capacity of river. It was never thought of de-silting the river due to the enormous cost, it requires and the problem of ways and means to dispose the de silted sand. Consequence of this change in river regime and reduction in carrying capacity of the River Vaipparu, the shoals in the rivers, divert the flow of water resulting in bund erosion and consequent breaches, which lead to loss of property and lives. Solution to the above problem is to de-silt the shoals in the River Vaipparu by expending huge amount. Alternatively, the economical solution to this problem is to mine the sand and remove the shoals. This option would yield the net revenue to the state exchequer apart from making availability of the important construction material for infrastructure development at a reasonable price to the common people.

5. As per G.O No. 46/industries (MMCI) Department, dated 25.09.2002 a committee had been constituted to conduct survey of river sand river beds in the state with reference to sand quarry. The committee concluded that, even though several rules on sand mining exist illegal quarrying of sand is out of control. Authority for regulating sand mining is vested with different organization such as, State Geology and Mining Department, Revenue Public Works Department. Hence, implementation and monitoring of rules and regulation regarding sand quarry are not effective. This important task of sand mining therefore, should be entrusted to a Single Agency.
6. The Government issued an order vide G.O.Ms. No. 95, industries (MMC.1) Department, Dt.01.10.2003 to operate sand quarries in Tamil Nadu by Public Works department. Accordingly, sand quarrying operations are being carried out from October 2003 in Districts of the Tamil Nadu. Hence this project of removing of sand for maintaining the functional efficiency of River Vaipparu and its carrying capacity.
7. The Government issued the G.O. (D) No. 67/Industries (MMC-1) Department/dated 11.03.2011; the District Collectors have been authorized to grant the permission for usage of Machineries in sand quarry operation except Palar and Tamirabarani Rivers.
8. The Government has issued an order in G.O. No. (2D) 21 Industries Department Dated. 02.06.2017 in which the Government had removed the powers to grant the deployment of machineries in sand quarry operations and the competent authority i.e., SEIAA will decide the sufficient number of machineries in sand quarry operations after the Ministry of Environment and Forest, Notification Dated 15.01.2016 under Sec. 3(2) of the Environment Protection Act.



9. The applicant proposed to quarry Sand in Government land (River Vaipparu) over an extent of 4.95.50 Hectares, S.F.NO.1095 (P) in Nenmeni Village, Sattur Taluk, Virudhunagar District and Tamil Nadu for a period of **Six Months** only. The excavated Sand will be used for Construction activities domestic purpose and other infrastructure development work in and around the district.
10. After getting Precise Area approval, a detailed Mining Plan and sketch is prepared by the Executive Engineer, PWD using the services of a **NABET accredited consultant** who holds the pivotal role in the preparation of mining plan. Due responsibility has been taken by EIA consultant in the mining plan preparation taking care of adhering to all mining rules, existing as on date. The mining plan shall contain the details of quantity to be excavated, the period of mining, method of excavation, deployment of required machinery, Environment Management Plan (EMP), proposed number of laborers to be deployed and Conceptual Mining Plan, as per Rule 41 & 42 of TNMMC Rules 1959. It is also the duty of the consultant to give the safe distance of 50m or twice the bank height from the toe of the riverbank, whichever is higher and fixing the Geo coordinates for boundaries using DGPS AND TOTAL STATION instruments. A safety distance of 50 meter should be left to the river bank of the river and no way should it not cause any damage to them while quarrying and transportation of sand.
11. **Mandatory Provisions of the Sand Mining Management Guidelines, 2020:** Due consideration of environmental parameters so as to obtain Environmental Clearance (EC) is strictly observed including the following,
- Physical survey** of the field by the conventional method using DGPS and Total station to fix RL of reference bench mark, pillars, Ground control points (GCP)
 - Bench Mark/Theoretical Bed Level**, Safety distance from the bank of the river and levels (MSL & RL) of the corner point of each grid are identified and safety barriers (Non-Mining) demarcated as restricted in consensus with Mineral Concession Rules of respective State (Tamil Nadu) and the provision mentioned in this Sustainable Sand Mining Management Guidelines.
 - Sampling** of sand at 30m x 30m grid interval to assess bulk density, grain size, texture mineral composition etc.,
 - Flight Planning:** - The lease co-ordinates and the flight plan was devised to capture the front and side overlap percentages for in each flight in reference to global coordinates (Kml or SHP file) system. Overlapping at 60% and side lapping with 40% for every fly lines. Separate fly line was made with camera at 45° angle to capture 3D views of the lease area.



- c) UAV/Drone fitted with advance camera with PPK techniques adopted to fly at 100m height/datum as to survey and capture photos of the defined area to prepare surface plan showing important features, habitations, infrastructures like bridge, pump house, culverts, Spatial distribution of flora/Fauna.
- f) **Photogrammetry:** Data processing using software to add and align photographs, merge the photographs with ground control points (GCP) taken at several reference points using DGPS AND TOTAL STATION.
- g) **Output:** Generating output of 2D mosaic birds eye views of both core and buffer areas, 3D view of the core area (Lease area), Planimetric vector map of all surface features like road, water body, bridges, pump house etc., contouring with 0.25m interval, spot level at 10m x 10m grid for estimation of shoal and mineable reserves of sand below theoretical bed level, visual display of shoal and mineable reserves by DTM/DEM with colour code etc.,
- h) **Video and Photography** of core and buffer area
12. **Geological reserves are estimated by two methods as follows,**
- Conventional methods of Plans and sections by Area/cross sectional methods using AutoCAD
 - Photogrammetric method to estimate the geological reserves from Geo-referenced (GCP) aerial photographs.

Method	Geological Reserves (m ³)		Total Geological Reserves (m ³) (Shoal + Reserves)
Photogrammetric contour method	Silt above Theoretical bed level (0.647m Avg.)	32084	1, 80,734
	Reserves 3m below Depth of estimation	1, 48,650	

Geological reserves are estimated at **1,80,734m³** up to 3m depth below Theoretical Bed level including silt of 32084m³ (Avg. height of 0.647m).

13. **EMP measures to be adopted shall be,**

- The river water should not be polluted by spillages and dumping of waste sand, red soil etc if any. A safety distance of 50 meter should be left to the river bank no damage to will cause them while quarrying and transportation of sand.
- Depth of Quarrying should not exceed the permitted depth of 1m from River bed level. At any cost ground water level in the basin should not be affected by deep quarrying which cause for hydrological gradient towards the pit and depletion of ground water in the river basin and its surrounding open wells.

- c) Land degradation by undulation should be avoided. As practically as possible, the sand should be removed in an uniform layer without any land degradation.
- d) Portable containers for office, stores, canteen and rest shed has to be arranged at Site with septic tank provisions.
- e) Steps should be taken to control dust at source while loading and transport roads. While transporting loose soil on main road tarpaulin should be covered over the material to control fly of dust,
- f) Quarrying operation should be restricted during day hours only otherwise prescribed illumination level as per Indian Electricity Rules, 1956 and DGMS circulars for illumination at loading, transport and dumping points have to be maintained with prior permission.
- g) Any other conditions as stipulated by the concerned safety and Environmental authorities, related to quarry operation.

14. General Conditions which attracts "B₂" Category,

- i) **Kothankulam reserve forest** is located at 95km on Northwestern direction; Kurumalai Reserve forest is located at 55km on S direction.
- ii) Tamil Nadu and Kerala Interstate boundary is located at 155km on Western side.
- iii) **Srivalliputhur wild animal sanctuary** is located at 86km on Northwestern Side. There is no Wildlife sanctuary found within **10Kms** radius from the project, hence this area does not attract the Wildlife (Protection) Act, 1972.
- iv) The proposed quarry is located **90km** away from Bay of Bengal on South eastern side.

Hence, the project doesn't attract the C.R.Z. Notification, 1991. Therefore the project seeks clearance only from SEIAA, under B2 Category.

INTRODUCTION

The EIA (Environmental Impact Assessment) Notification, 2006, requires mining projects, including new projects, expansion, modernization, or renewal of mine leases of minor minerals less than 5 Ha also has to obtain Environmental clearance from the state level EIA Authorities.

To ensure compliance of Supreme Court order of February 27, 2012, it had now been decided that all mining projects of minor minerals irrespective of the size of the lease would henceforth require prior environment clearance. Accordingly the mining plan is prepared for systematic and scientific mining and obtains Environmental clearance under State level EIA Authority by duly incorporating Sand Mining Management Guidelines, 2020.

The applicant, The Executive Engineer, Water Resources Organization, Mining and Monitoring Division, Madurai is a government organization having previous experience and skill

on quarrying of sand. Quarry lease shall be granted for a period of Six Months over an extent of 4.95.50Ha in Vaipparu River, S.F.No.1095(P), Nenmeni Village, Sattur Taluk, Virudhunagar District and Tamil Nadu.

As per Rule 38A of TNMCR, 1959 subject to the following conditions:-

1. No Quarrying operation shall be carried out within 500m from the drinking water well of the local bodies of the proposed area.
2. The ultimate working depth shall be one meter from river bed level.
3. Sand quarrying shall not be carried out below ground water table under any circumstances.
4. Stream Mining shall not be allowed.
5. It shall be ensured that excavation of sand do not disturb or change the underlying soil characteristics of the river bed where quarrying is proposed to be carried out. The adequate safety distance should be maintained for Bund.
6. Before commencing quarry, the boundary stones should be planted with the cooperation of concern Revenue officers in proposed area.

The District collector Virudhunagar granted the precise area communication letter vide Rc.No.KV1/347/2022, dated 23.03.2022 to get approved mining plan and obtain environmental clearance from the SEIAA, Tamil Nadu with the following Conditions,

1. No Quarrying operation shall be carried out within 500m from the drinking water well of the local bodies of the proposed area.
2. Quarrying of sand should be carried out 50m away from the river Bank of the river.
3. The applicant department should provide permanent bench mark shows the level of the river bed in the subject survey number.
4. Boundary stoned should be laid all along the demarcated area as permitted.
5. The ultimate working depth shall be one meter from theoretical bed level.
6. Sand quarrying shall not be carried out below ground water table under any circumstances.
7. River course should not be disturbed or changed due to quarrying of sand.
8. Sand quarrying Should not cause any hindrance to the public while quarrying of sand in the river bed
9. It shall be ensured that excavation of sand do not disturb or change the underlying soil characteristics of the river bed where quarrying is proposed to be carried out.
10. Stream mining shall not be allowed.
11. Machineries shall be used for the above said sand quarry as per instruction given by SEIAA.
12. The Conditions specified in Tamil Nadu Minor Mineral Concession rules 1959, should be strictly adhered during the course of quarrying of sand.



Precise area Communication Letter has been attached in the ANNEXURE-D

After getting Precise Area approval, a detailed Mining Plan and sketch has been prepared by the Executive Engineer, PWD using the services of a NABET accredited consultant who holds the pivotal role in the preparation of mining plan as per the Sand Mining guidelines, 2020. The mining plan contain the details of quantity to be excavated, the period of mining, method of excavation, deployment of required machinery, Environment Management Plan (EMP), proposed number of laborers to be deployed and Conceptual Mining Plan, as per Rule 41 of TNMMC Rules 1959. Safe distance of 50m or twice the bank height from the toe of the riverbank, whichever is higher and fixing the Geo coordinates for boundaries using DGPS AND TOTAL STATION instruments.

1. GENERAL INFORMATION

1.1. a) Name of the Applicant: **THE EXECUTIVE ENGINEER**
Water Resource Organization,
Mining and Monitoring Division,
Madurai, Tamil Nadu.

b) Status of the Applicant : Government of Tamil Nadu (WRO, MMD - Madurai)

1.2. a) Mineral Which the applicant intends to mine: Sand

1.2. b) Precise Area Communication letter details received from the competent authority of the Government : Rc.No.KV1/347/2022, dated 23.03.2022 (Enclosed in Annexure -I)

1.2. c) Period of permission / lease to be granted: Six Months

1.2. d) Name and address of Accredited Consultant Organization (ACO) who prepare the mining plan :

Name : **Shri. S.SURIYAKUMAR**
M.Sc., M.Phil. (Geo), F.C.C. (Min), PGDBA, PGDIPC,
EIA Coordinator (Mining),
Accredited Consultant Organization (ACO)
Reg. No. NABET/EIA/2124/RA 0228.

Address : **AADHI BOOMI MINING AND ENVIRO TECH (P) LTD.,**
3/216, K.S.V. Nagar, Narasothipatti,
Alagapuram Post, Salem – 636 004. TN.

Web site : www.abmenvirotec.com

E-mail : suriyakumarsemban@gmail.com, abmenvirotech@gmail.com

Phone : 0427 – 2440446, Mobile : +91 9842729655

Validity : Valid up to 22.10.2024

2. LOCATION

a) Details of the Area:

The area is represented by Geological Survey of India Toposheet No. 58G/15 and falls between Latitude of N9°19'08.1037" to N9°19'16.9688" and Longitude of E77°59'30.6180" to E77°59'42.8811"

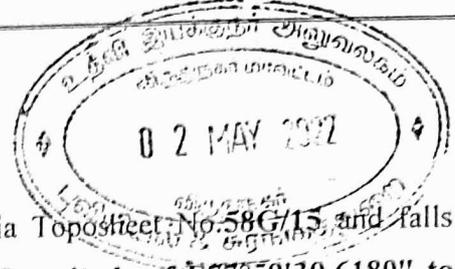


Table No.1. Geo Coordinates of Applied area by DGPS Survey

P.No	Latitude	Longitude	Northing	Easting	Elevation
1	9°19'14.0982"	77°59'30.6180"	1031686.065	828692.765	45.657
2	9°19'16.9688"	77°59'33.7996"	1031775.16	828789.197	46.482
3	9°19'13.1709"	77°59'42.8811"	1031660.72	829067.573	46.489
4	9°19'08.1037"	77°59'40.8007"	1031504.361	829005.349	47.912

Table No.2. Details of Lease Applied area

District	Taluk	Village	S.F.No	Area (Ha)
Virudhunagar & TamilNadu	Sattur	Nenmeni	1095(P)	4.95.50Ha

b) Classification of the Area: River Poramboke

c) Ownership / Occupancy of the applied area: Government Land –River Poramboke

e) Existence of Public Road / Railway line, if any nearby and approximate distance

The area is accessible from Virudhunagar to reach Irukankudi via Sattur by 38Km Further 2.5Km to reach the site. A Village road is available nearby the site on North Eastern side. The PWD make temporary road which connects the village road for transportation of Materials.

[Signature]
18/4/22.

Assistant Engineer, PWD/WRD
Section - II
Mining and Monitoring Sub Division
Virudhunagar.

[Signature]
18/4/2022

ASSISTANT ENGINEER P.W.D.W.R.D
MINING & MONITORING SECTION - III
VIRUDHUNAGAR - 626 001.

[Signature]
18/4/22

ASSISTANT ENGINEER P.W.D.W.R.D
MINING & MONITORING SECTION - IV
VIRUDHUNAGAR - 626 001.

[Signature]
18/4/22

Assistant Executive Engineer, PWD/WRD
Mining and Monitoring Subdivision,
Virudhunagar

[Signature]
21/04/22

Executive Engineer PWD/WRD
Mining and Monitoring Division
Madurai - 625 002

[Signature]
21/4/22

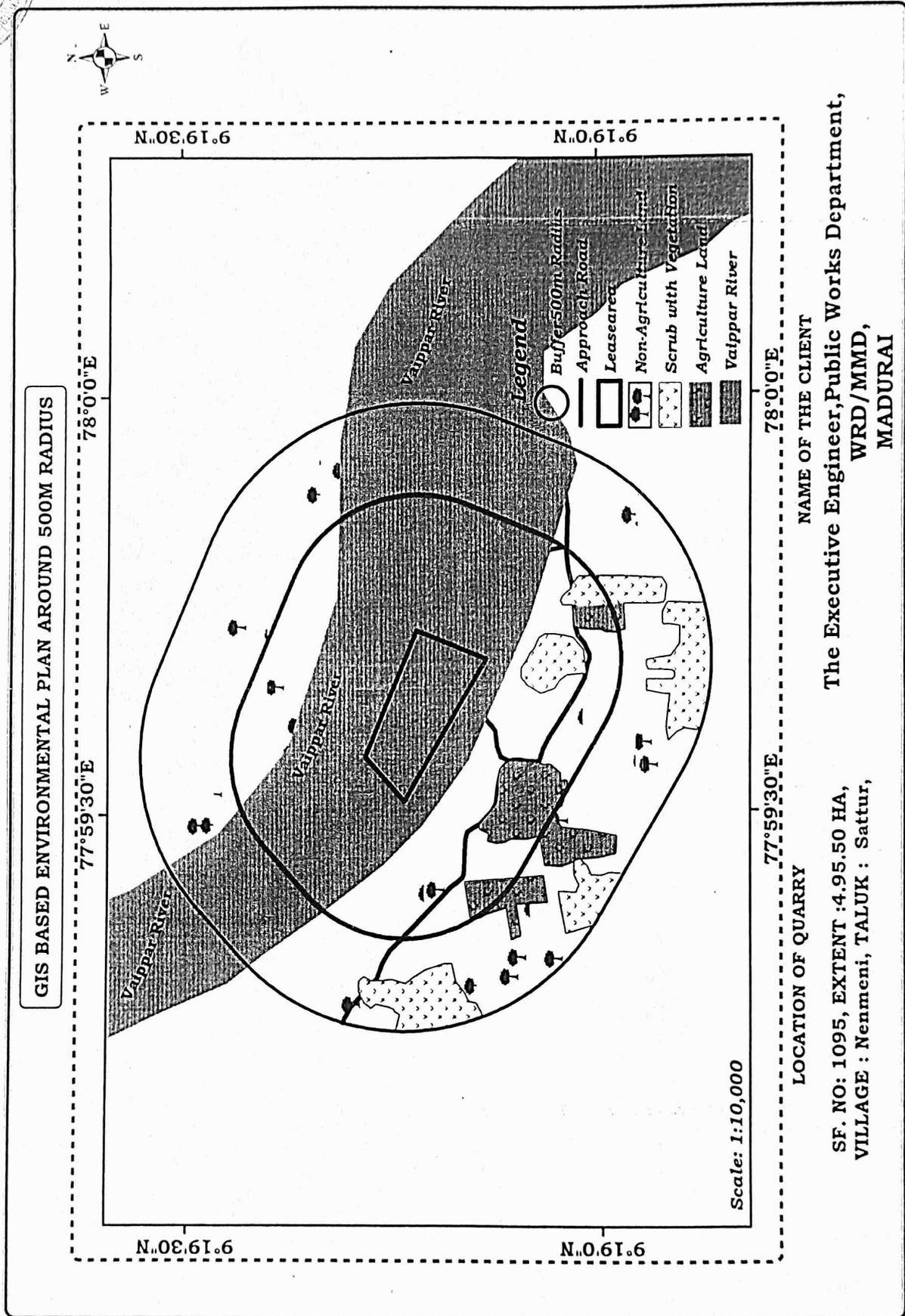
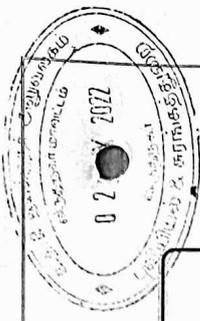
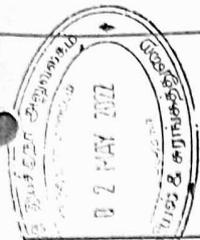


Fig. No.1. Road Accessibility Map

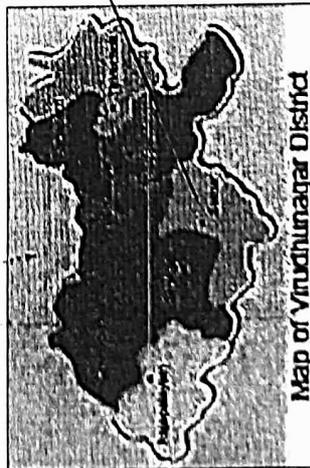
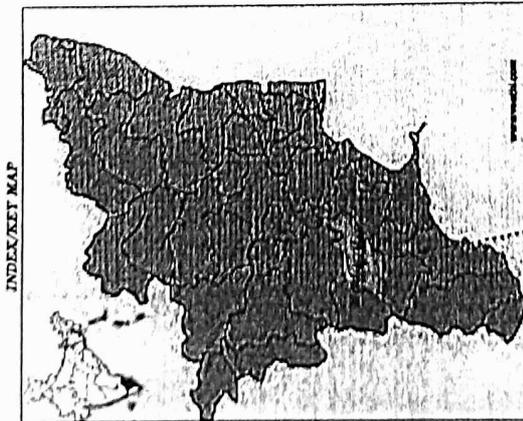


LOCATION & ACCESSIBILITY MAP

SF. NO: 1095, EXTENT :4.95.50 HA, VILLAGE : Nenment, TALUK : Sattur, DISTRICT : Virudhunagar



Legend:
Mine Lease Boundary



Geo coordinates:

Latitude : 9°19'08.1037" to 9°19'16.9688"
Longitude : 77°59'30.6180" to 77°59'42.8811"

Scale 1:4000

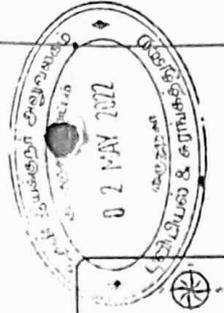
Proponent Name
The Executive Engineer,

Fig.No.2: Location and Accessibility Map of the proposed Nenment Sand quarry

Details of infrastructures and communication are given in the table below,

Table No.3. Details of infrastructures and communication

S.No.	Description	Place	Distance (km)	Direction
1	Railway	Sattur	8.5	NW
2	Post office	Sattur	8.5	NW
3	Airport	Madurai	58	NE
4	Police station	Irukkankudi	1.6	NE
5	Fire service	Sattur	9	NW
6	Primary Health centre	Sattur	8.5	NW
7	DSP Office	Sattur	9	NW
8	School	Mettuppatti	1.5	NE
9	Nearest Town	Sattur	8	NW
10	Villages			
	i)	Nenmeni	1	NW
	ii)	Sattur	1.5	N
	iii)	N. Mettuppatti	2	NE
	iv)	M. Nagalapuram	2	E



GIS BASED BUFFER OF 300M AND 500M RADIUS OVER THE GOOGLE EARTH IMAGE



<p>Buffer Zone 500m Radius</p> <p>Buffer Zone 300m Radius</p> <p>Mine Lease Area</p>	<p>LOCATION OF QUARRY</p> <p>SF. NO: 1095, EXTENT: 4.95.50 HA, VILLAGE : Nemmenl, TALUK : Sattur, DISTRICT : Virudhunagar STATE : Tamilnadu.</p>	<p>ADDRESS OF APPLICANT</p> <p>THE EXECUTIVE ENGINEER, PUBLIC WORKS DEPARTMENT, WRD/MMD, MADURAI</p>	<p>EIA CO-ORDINATOR,</p> <p><i>S. Suriyanmar</i> S. SURIYANMAR EIA Consultant</p>
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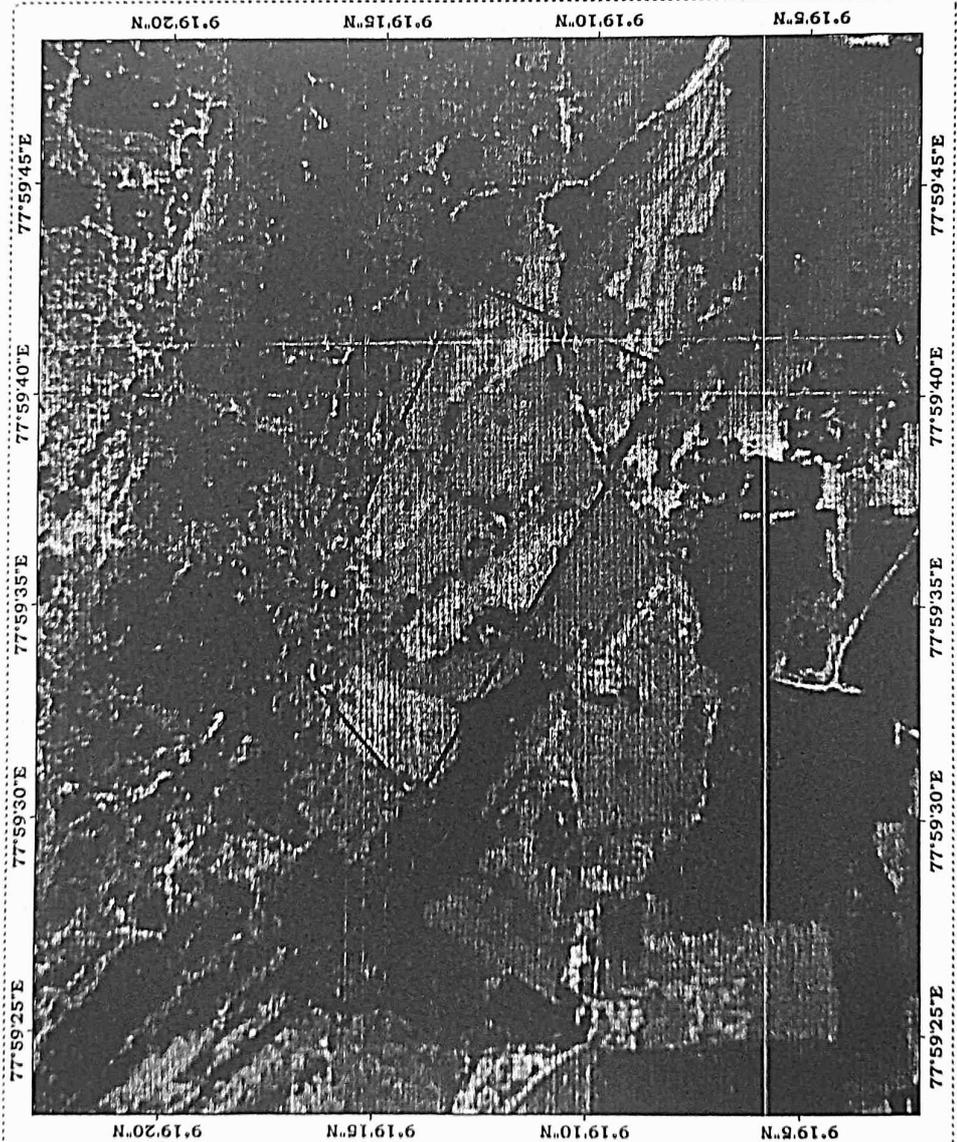
INDEX

SCALE: 1:5000

Fig.No.3: image showing lease boundary with Geo coordinates and Surface features around 300/500m from the quarry lease area



GOOGLE EARTH IMAGE SHOWING LOCATION OF MINE LEASE BOUNDARY WITH GEO COORDINATES OF PILLARS



Legend

	Applied Lease Area
LOCATION OF QUARRY SF. NO: 1095, EXTENT -4.95.50 HA, VILLAGE : Nenmeni, TALUK : Sattur, DISTRICT : Virudhunagar STATE : Tamilnadu.	
ADDRESS OF APPLICANT THE EXECUTIVE ENGINEER, PUBLIC WORKS DEPARTMENT, WRD/MMD, MADURAI.	

P.No	Latitude	Longitude	Northing	Easting	Elevation
1	9°19'14.0982"	77°59'30.6180"	1031686.065	828692.765	45.657
2	9°19'16.9688"	77°59'33.7996"	1031775.16	828789.197	46.482
3	9°19'13.1709"	77°59'42.8811"	1031660.72	829067.573	46.489
4	9°19'08.1037"	77°59'40.8007"	1031504.361	829005.349	47.912

Scale: 1:2000



Fig.No.4: Google Image showing Mine Lease boundary of the Proposed Quarry Lease area

PART-A

3. GEOLOGY AND MINERAL RESERVES

3.1 Brief Description of the Topography and general geology of the area

a) **Topography:** Drone/UAV fitted with the advance camera are used for aerial photography to capture fast and reliable output deliveries. The survey is conducted using a set of instruments and compatible software to utilize the geo-referenced data for depicting the topography of the study area. Instrument calibration and software compatibility and its validation with the ground data are an essential requirement for using this technique.

Topography is derived by taking ground control points (GCP) using DGPS AND TOTAL STATION and geo coordinates are depicted to global grid using Post Processing Kinematic software (PPK). These GCPs are transferred to Photographs taken by Drone and got rectified geo-referenced images so as to make contours with 0.25m interval. Spot level in 10m x 10m interval was derived using photogrammetry method of processing around 100m from the lease boundary of the applied area.

In addition to 100m buffer with 10m x 10m grid levels, contours are generated 1km on upstream and 1km on downstream to show the general gradient of river in three seasons as Pre-monsoon, monsoon and post monsoon by change deduction analysis with respect to the current data taken from GPS controlled Drone to assess continuous mechanical action of the river as Weathering, Erosion, Transportation and Depositional process.

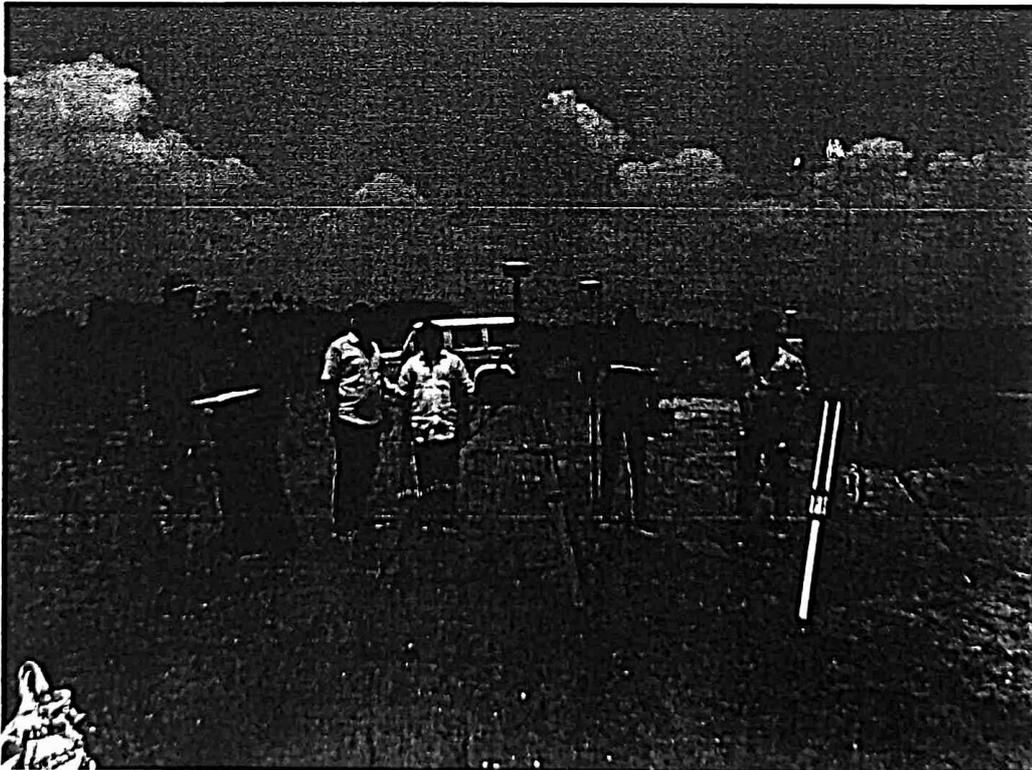


Fig.No.5: Photo showing DGPS survey to fix boundary pillars



Fig.No.6: DGPS Survey to fix GCP for Aerial Surveying

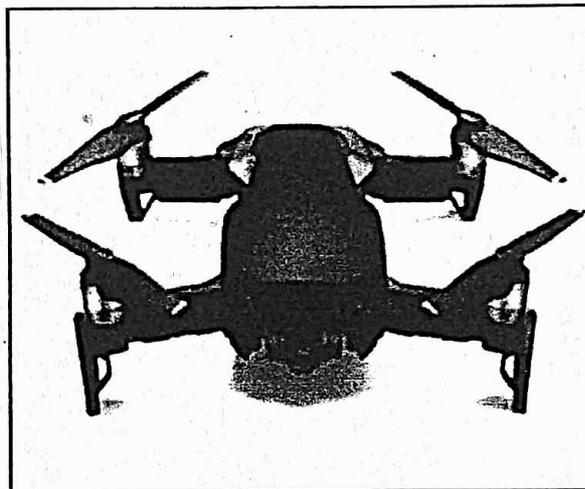
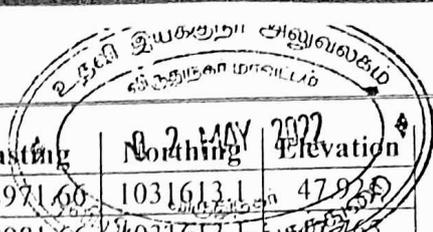


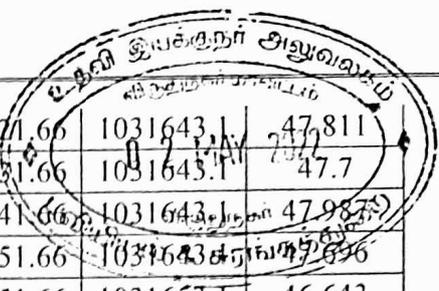
Fig.No.7: Drone used for Aerial Surveying

Table No.4: SPOT LEVELS OF LEASE AREA AT 10m X 10m GRID INTERVAL derived by
Photogrammetry

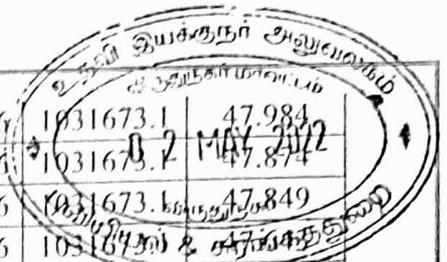
S.No	Easting	Northing	Elevation	S.No	Easting	Northing	Elevation
1	828991.66	1031513.1	47.145	43	829021.66	1031513.1	47.125
2	829001.66	1031513.1	47.483	44	828891.66	1031573.1	47.195
3	828981.66	1031523.1	47.696	45	828901.66	1031573.1	47.658
4	828991.66	1031523.1	47.61	46	828917.66	1031573.1	47.037
5	829001.66	1031523.1	47.498	47	828921.66	1031573.1	47.389
6	829011.66	1031523.1	47.634	48	828931.66	1031573.1	47.456
7	828961.66	1031533.1	47.653	49	828941.66	1031573.1	47.481
8	828971.66	1031533.1	47.726	50	828951.66	1031573.1	47.657
9	828981.66	1031533.1	47.662	51	828961.66	1031573.1	47.798
10	828991.66	1031533.1	47.54	52	828971.66	1031573.1	47.826
11	829001.66	1031533.1	47.679	53	828981.66	1031573.1	47.497
12	829011.66	1031533.1	47.748	54	828991.66	1031573.1	47.846
13	828941.66	1031543.1	47.158	55	829001.66	1031573.1	47.57
14	828951.66	1031543.1	47.509	56	829011.66	1031573.1	47.488
15	828961.66	1031543.1	47.764	57	828871.66	1031583.1	47.245
16	828971.66	1031543.1	47.653	58	828881.66	1031583.1	47.547
17	828981.66	1031543.1	47.852	59	828891.66	1031583.1	47.706
18	828991.66	1031543.1	47.671	60	828901.66	1031583.1	47.234
19	829001.66	1031543.1	47.776	61	828911.66	1031583.1	47.445
20	829011.66	1031543.1	47.822	62	828921.66	1031583.1	47.558
21	828921.66	1031553.1	47.239	63	828931.66	1031583.1	47.6
22	828931.66	1031553.1	47.192	64	828941.66	1031583.1	47.265
23	828941.66	1031553.1	47.705	65	828951.66	1031583.1	47.599
24	828951.66	1031553.1	47.606	66	828961.66	1031583.1	47.731
25	828961.66	1031553.1	47.578	67	828971.66	1031583.1	47.84
26	828971.66	1031553.1	47.661	68	828981.66	1031583.1	47.662
27	828981.66	1031553.1	47.683	69	828991.66	1031583.1	47.459
28	828991.66	1031553.1	47.702	70	829001.66	1031583.1	47.433
29	829001.66	1031553.1	47.687	71	829011.66	1031583.1	47.662
30	829011.66	1031553.1	47.742	72	829021.66	1031583.1	47.588
31	829021.66	1031553.1	47.659	73	828861.66	1031593.1	47.55
32	828911.66	1031563.1	47.378	74	828871.66	1031593.1	47.863
33	828921.66	1031563.1	47.005	75	828881.66	1031593.1	47.856
34	828931.66	1031563.1	47.414	76	828891.66	1031593.1	47.808
35	828941.66	1031563.1	47.448	77	828901.66	1031593.1	47.26
36	828951.66	1031563.1	47.651	78	828911.66	1031593.1	47.523
37	828961.66	1031563.1	47.558	79	828921.66	1031593.1	47.502
38	828971.66	1031563.1	47.678	80	828931.66	1031593.1	47.234
39	828981.66	1031563.1	47.912	81	828941.66	1031593.1	47.767
40	828991.66	1031563.1	47.686	82	828951.66	1031593.1	47.683
41	829001.66	1031563.1	47.642	83	828961.66	1031593.1	47.513
42	829011.66	1031563.1	47.693	84	828971.66	1031593.1	47.415



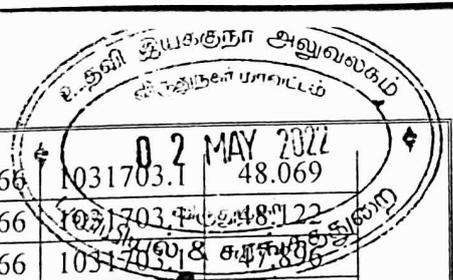
S.No	Easting	Northing	Elevation	S.No	Easting	Northing	Elevation
85	828981.66	1031593.1	47.449	127	828971.66	1031613.1	47.928
86	828991.66	1031593.1	47.788	128	828981.66	1031613.1	47.65
87	829001.66	1031593.1	47.837	129	828991.66	1031613.1	47.474
88	829011.66	1031593.1	47.676	130	829001.66	1031613.1	47.554
89	829021.66	1031593.1	47.579	131	829011.66	1031613.1	47.481
90	829031.66	1031593.1	47.538	132	829021.66	1031613.1	47.456
91	828841.66	1031603.1	47.468	133	829031.66	1031613.1	47.467
92	828851.66	1031603.1	47.856	134	829041.66	1031613.1	47.458
93	828861.66	1031603.1	47.926	135	828801.66	1031623.1	46.65
94	828871.66	1031603.1	47.906	136	828811.66	1031623.1	46.307
95	828881.66	1031603.1	47.785	137	828821.66	1031623.1	45.56
96	828891.66	1031603.1	47.362	138	828831.66	1031623.1	47.229
97	828901.66	1031603.1	47.041	139	828841.66	1031623.1	48.147
98	828911.66	1031603.1	47.348	140	828851.66	1031623.1	47.94
99	828921.66	1031603.1	47.67	141	828861.66	1031623.1	47.866
100	828931.66	1031603.1	47.806	142	828871.66	1031623.1	47.657
101	828941.66	1031603.1	47.793	143	828881.66	1031623.1	46.825
102	828951.66	1031603.1	47.724	144	828891.66	1031623.1	47.466
103	828961.66	1031603.1	47.635	145	828901.66	1031623.1	47.814
104	828971.66	1031603.1	47.46	146	828911.66	1031623.1	48.1
105	828981.66	1031603.1	47.674	147	828921.66	1031623.1	48.175
106	828991.66	1031603.1	47.752	148	828931.66	1031623.1	48.051
107	829001.66	1031603.1	47.703	149	828941.66	1031623.1	47.944
108	829011.66	1031603.1	47.683	150	828951.66	1031623.1	47.975
109	829021.66	1031603.1	47.52	151	828961.66	1031623.1	47.957
110	829031.66	1031603.1	47.459	152	828971.66	1031623.1	47.944
111	829041.66	1031603.1	47.428	153	828981.66	1031623.1	47.68
112	828821.66	1031613.1	45.539	154	828991.66	1031623.1	47.669
113	828831.66	1031613.1	47.489	155	829001.66	1031623.1	47.661
114	828841.66	1031613.1	47.895	156	829011.66	1031623.1	47.775
115	828851.66	1031613.1	47.978	157	829021.66	1031623.1	47.743
116	828861.66	1031613.1	47.919	158	829031.66	1031623.1	47.547
117	828871.66	1031613.1	47.798	159	829041.66	1031623.1	47.497
118	828881.66	1031613.1	47.423	160	829051.66	1031623.1	47.538
119	828891.66	1031613.1	47.013	161	828791.66	1031633.1	46.573
120	828901.66	1031613.1	47.851	162	828801.66	1031633.1	46.639
121	828911.66	1031613.1	47.774	163	828811.66	1031633.1	46.388
122	828921.66	1031613.1	47.906	164	828821.66	1031633.1	46.22
123	828931.66	1031613.1	48.049	165	828831.66	1031633.1	47.198
124	828941.66	1031613.1	47.919	166	828841.66	1031633.1	47.98
125	828951.66	1031613.1	47.823	167	828851.66	1031633.1	47.916
126	828961.66	1031613.1	47.715	168	828861.66	1031633.1	47.816
S.No	Easting	Northing	Elevation	S.No	Easting	Northing	Elevation
169	828871.66	1031633.1	47.056	211	829001.66	1031643.1	47.734
170	828881.66	1031633.1	47.933	212	829011.66	1031643.1	47.835



171	828891.66	1031633.1	47.655	213	829071.66	1031643.1	47.811
172	828901.66	1031633.1	48.219	214	829031.66	1031643.1	47.7
173	828911.66	1031633.1	48.09	215	829041.66	1031643.1	47.987
174	828921.66	1031633.1	48.067	216	829051.66	1031643.1	47.896
175	828931.66	1031633.1	47.933	217	828751.66	1031653.1	46.643
176	828941.66	1031633.1	47.881	218	828761.66	1031653.1	46.492
177	828951.66	1031633.1	47.855	219	828771.66	1031653.1	46.659
178	828961.66	1031633.1	47.734	220	828781.66	1031653.1	47.124
179	828971.66	1031633.1	47.672	221	828791.66	1031653.1	47.085
180	828981.66	1031633.1	47.775	222	828801.66	1031653.1	46.377
181	828991.66	1031633.1	47.964	223	828811.66	1031653.1	47.888
182	829001.66	1031633.1	47.651	224	828821.66	1031653.1	48.15
183	829011.66	1031633.1	47.677	225	828831.66	1031653.1	48.105
184	829021.66	1031633.1	47.504	226	828841.66	1031653.1	48.066
185	829031.66	1031633.1	47.454	227	828851.66	1031653.1	47.417
186	829041.66	1031633.1	47.737	228	828861.66	1031653.1	47.054
187	829051.66	1031633.1	47.82	229	828871.66	1031653.1	48.019
188	828771.66	1031643.1	46.441	230	828881.66	1031653.1	47.834
189	828781.66	1031643.1	46.953	231	828891.66	1031653.1	48.021
190	828791.66	1031643.1	46.763	232	828901.66	1031653.1	48.051
191	828801.66	1031643.1	46.64	233	828911.66	1031653.1	48.065
192	828811.66	1031643.1	46.499	234	828921.66	1031653.1	48.008
193	828821.66	1031643.1	47.268	235	828931.66	1031653.1	47.891
194	828831.66	1031643.1	48.112	236	828941.66	1031653.1	47.786
195	828841.66	1031643.1	48.033	237	828951.66	1031653.1	47.767
196	828851.66	1031643.1	47.861	238	828961.66	1031653.1	47.704
197	828861.66	1031643.1	47.221	239	828971.66	1031653.1	47.644
198	828871.66	1031643.1	47.509	240	828981.66	1031653.1	47.443
199	828881.66	1031643.1	47.673	241	828991.66	1031653.1	47.792
200	828891.66	1031643.1	47.999	242	829001.66	1031653.1	47.895
201	828901.66	1031643.1	48.058	243	829011.66	1031653.1	47.973
202	828911.66	1031643.1	48.05	244	829021.66	1031653.1	47.872
203	828921.66	1031643.1	48.022	245	829031.66	1031653.1	48.068
204	828931.66	1031643.1	47.948	246	829041.66	1031653.1	47.8
205	828941.66	1031643.1	47.911	247	829051.66	1031653.1	47.738
206	828951.66	1031643.1	47.768	248	829061.66	1031653.1	47.692
207	828961.66	1031643.1	47.786	249	828731.66	1031663.1	46.722
208	828971.66	1031643.1	47.867	250	828741.66	1031663.1	46.777
209	828981.66	1031643.1	47.86	251	828751.66	1031663.1	46.861
210	828991.66	1031643.1	47.486	252	828761.66	1031663.1	46.81
S.No	Easting	Northing	Elevation	S.No	Easting	Northing	Elevation
253	828771.66	1031663.1	47.035	295	828851.66	1031673.1	47.912
254	828781.66	1031663.1	47.149	296	828861.66	1031673.1	47.992
255	828791.66	1031663.1	46.54	297	828871.66	1031673.1	48.089
256	828801.66	1031663.1	47.222	298	828881.66	1031673.1	48.093
257	828811.66	1031663.1	48.032	299	828891.66	1031673.1	47.96



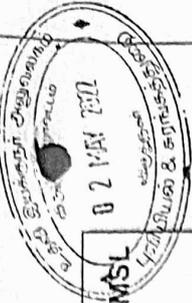
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259	828831.66	1031663.1	48.093	301	828911.66	1031673.1	47.874
260	828841.66	1031663.1	47.41	302	828921.66	1031673.1	47.849
261	828851.66	1031663.1	46.838	303	828931.66	1031673.1	47.827
262	828861.66	1031663.1	47.943	304	828941.66	1031673.1	47.51
263	828871.66	1031663.1	47.87	305	828951.66	1031673.1	47.823
264	828881.66	1031663.1	48.048	306	828961.66	1031673.1	48.035
265	828891.66	1031663.1	48.043	307	828971.66	1031673.1	48.108
266	828901.66	1031663.1	48.063	308	828981.66	1031673.1	48.054
267	828911.66	1031663.1	48.001	309	828991.66	1031673.1	47.888
268	828921.66	1031663.1	47.858	310	829001.66	1031673.1	47.701
269	828931.66	1031663.1	47.799	311	829011.66	1031673.1	47.952
270	828941.66	1031663.1	47.763	312	829021.66	1031673.1	48.151
271	828951.66	1031663.1	47.641	313	829031.66	1031673.1	45.495
272	828961.66	1031663.1	47.475	314	828701.66	1031683.1	46.202
273	828971.66	1031663.1	47.549	315	828711.66	1031683.1	46.674
274	828981.66	1031663.1	47.899	316	828721.66	1031683.1	47.087
275	828991.66	1031663.1	48.025	317	828731.66	1031683.1	46.69
276	829001.66	1031663.1	48.05	318	828741.66	1031683.1	46.884
277	829011.66	1031663.1	47.905	319	828751.66	1031683.1	47.199
278	829021.66	1031663.1	47.81	320	828761.66	1031683.1	47.309
279	829031.66	1031663.1	47.872	321	828771.66	1031683.1	47.204
280	829041.66	1031663.1	47.597	322	828781.66	1031683.1	47.617
281	829051.66	1031663.1	47.905	323	828791.66	1031683.1	48.261
282	828721.66	1031673.1	46.385	324	828801.66	1031683.1	48.207
283	828731.66	1031673.1	46.731	325	828811.66	1031683.1	47.803
284	828741.66	1031673.1	46.539	326	828821.66	1031683.1	47.077
285	828751.66	1031673.1	46.745	327	828831.66	1031683.1	47.709
286	828761.66	1031673.1	47.04	328	828841.66	1031683.1	48.065
287	828771.66	1031673.1	47.354	329	828851.66	1031683.1	48.121
288	828781.66	1031673.1	47.45	330	828861.66	1031683.1	48.077
289	828791.66	1031673.1	46.665	331	828871.66	1031683.1	47.91
290	828801.66	1031673.1	48.084	332	828881.66	1031683.1	47.911
291	828811.66	1031673.1	48.113	333	828891.66	1031683.1	48.081
292	828821.66	1031673.1	47.978	334	828901.66	1031683.1	47.916
293	828831.66	1031673.1	47.581	335	828911.66	1031683.1	47.645
294	828841.66	1031673.1	46.89	336	828921.66	1031683.1	
S.No	Easting	Northing	Elevation	S.No	Easting	Northing	Elevation
337	828931.66	1031683.1	47.794	379	828761.66	1031703.1	46.822
338	828941.66	1031683.1	47.609	380	828771.66	1031703.1	47.301
339	828951.66	1031683.1	47.929	381	828781.66	1031703.1	47.36
340	828961.66	1031683.1	48.038	382	828791.66	1031703.1	47.001
341	828971.66	1031683.1	48.093	383	828801.66	1031703.1	46.479
342	828981.66	1031683.1	48.058	384	828811.66	1031703.1	47.174
343	828991.66	1031683.1	48.126	385	828821.66	1031703.1	47.129
344	829001.66	1031683.1	48.033	386	828831.66	1031703.1	48.106



345	828701.66	1031693.1	46.289	387	828841.66	1031703.1	48.069
346	828711.66	1031693.1	46.251	388	828851.66	1031703.1	48.122
347	828721.66	1031693.1	46.819	389	828861.66	1031703.1	47.896
348	828731.66	1031693.1	46.869	390	828871.66	1031703.1	47.996
349	828741.66	1031693.1	46.708	391	828881.66	1031703.1	47.89
350	828751.66	1031693.1	46.733	392	828891.66	1031703.1	47.867
351	828761.66	1031693.1	46.939	393	828901.66	1031703.1	47.752
352	828771.66	1031693.1	47.421	394	828911.66	1031703.1	47.785
353	828781.66	1031693.1	46.931	395	828921.66	1031703.1	47.966
354	828791.66	1031693.1	46.5	396	828931.66	1031703.1	48.145
355	828801.66	1031693.1	48.335	397	828941.66	1031703.1	48.079
356	828811.66	1031693.1	47.894	398	828951.66	1031703.1	48.271
357	828821.66	1031693.1	47.577	399	828961.66	1031703.1	47.765
358	828831.66	1031693.1	47.182	400	828731.66	1031713.1	46.901
359	828841.66	1031693.1	48.077	401	828741.66	1031713.1	46.862
360	828851.66	1031693.1	48.109	402	828751.66	1031713.1	47.107
361	828861.66	1031693.1	48.024	403	828761.66	1031713.1	47.118
362	828871.66	1031693.1	47.853	404	828771.66	1031713.1	47.218
363	828881.66	1031693.1	47.998	405	828781.66	1031713.1	47.279
364	828891.66	1031693.1	47.991	406	828791.66	1031713.1	46.956
365	828901.66	1031693.1	47.735	407	828801.66	1031713.1	47.586
366	828911.66	1031693.1	47.732	408	828811.66	1031713.1	48.041
367	828921.66	1031693.1	47.706	409	828821.66	1031713.1	48.012
368	828931.66	1031693.1	47.671	410	828831.66	1031713.1	47.956
369	828941.66	1031693.1	47.928	411	828841.66	1031713.1	48.017
370	828951.66	1031693.1	48.052	412	828851.66	1031713.1	47.532
371	828961.66	1031693.1	48.163	413	828861.66	1031713.1	47.428
372	828971.66	1031693.1	48.07	414	828871.66	1031713.1	47.925
373	828981.66	1031693.1	47.87	415	828881.66	1031713.1	47.821
374	828711.66	1031703.1	46.584	416	828891.66	1031713.1	47.816
375	828721.66	1031703.1	46.843	417	828901.66	1031713.1	48.006
376	828731.66	1031703.1	46.744	418	828911.66	1031713.1	48.13
377	828741.66	1031703.1	46.634	419	828921.66	1031713.1	47.947
378	828751.66	1031703.1	46.848	420	828931.66	1031713.1	47.729

S.No	Easting	Northing	Elevation	S.No	Easting	Northing	Elevation
421	828741.66	1031723.1	47.071	452	828771.66	1031743.1	46.595
422	828751.66	1031723.1	46.946	453	828781.66	1031743.1	46.195
423	828761.66	1031723.1	47.076	454	828791.66	1031743.1	45.816
424	828771.66	1031723.1	46.884	455	828801.66	1031743.1	46.184
425	828781.66	1031723.1	47.393	456	828811.66	1031743.1	47.24
426	828791.66	1031723.1	47.089	457	828821.66	1031743.1	46.269
427	828801.66	1031723.1	47.357	458	828831.66	1031743.1	46.16
428	828811.66	1031723.1	47.521	459	828841.66	1031743.1	47.301
429	828821.66	1031723.1	47.906	460	828851.66	1031743.1	46.985
430	828831.66	1031723.1	47.976	461	828861.66	1031743.1	46.738
431	828841.66	1031723.1	47.942	462	828771.66	1031753.1	46.632
432	828851.66	1031723.1	48.144	463	828781.66	1031753.1	45.974
433	828861.66	1031723.1	48.226	464	828791.66	1031753.1	45.664
434	828871.66	1031723.1	48.182	465	828801.66	1031753.1	46.704
435	828881.66	1031723.1	47.921	466	828811.66	1031753.1	46.576
436	828891.66	1031723.1	48.034	467	828821.66	1031753.1	46.22
437	828901.66	1031723.1	48.195	468	828831.66	1031753.1	46.216
438	828911.66	1031723.1	47.941	469	828781.66	1031763.1	46.71
439	828751.66	1031733.1	46.845	470	828791.66	1031763.1	46.589
440	828761.66	1031733.1	46.751	471	828801.66	1031763.1	46.478
441	828771.66	1031733.1	46.758	472	828811.66	1031763.1	46.377
442	828781.66	1031733.1	47.068	473	829031.66	1031573.1	47.461
443	828791.66	1031733.1	46.837	474	829031.66	1031583.1	47.708
444	828801.66	1031733.1	46.534	475	829021.66	1031573.1	47.532
445	828811.66	1031733.1	46.726	476	828761.66	1031743.1	46.739
446	828821.66	1031733.1	47.361	477	828871.66	1031733.1	46.844
447	828831.66	1031733.1	46.754				
448	828841.66	1031733.1	47.766				
449	828851.66	1031733.1	47.934				
450	828861.66	1031733.1	47.182				
451	828881.66	1031733.1	48.018				

Total Readings for 4.95.5 Ha @ 10m x10m = 477 points



ELEVATION IN MTS ABOVE MSL

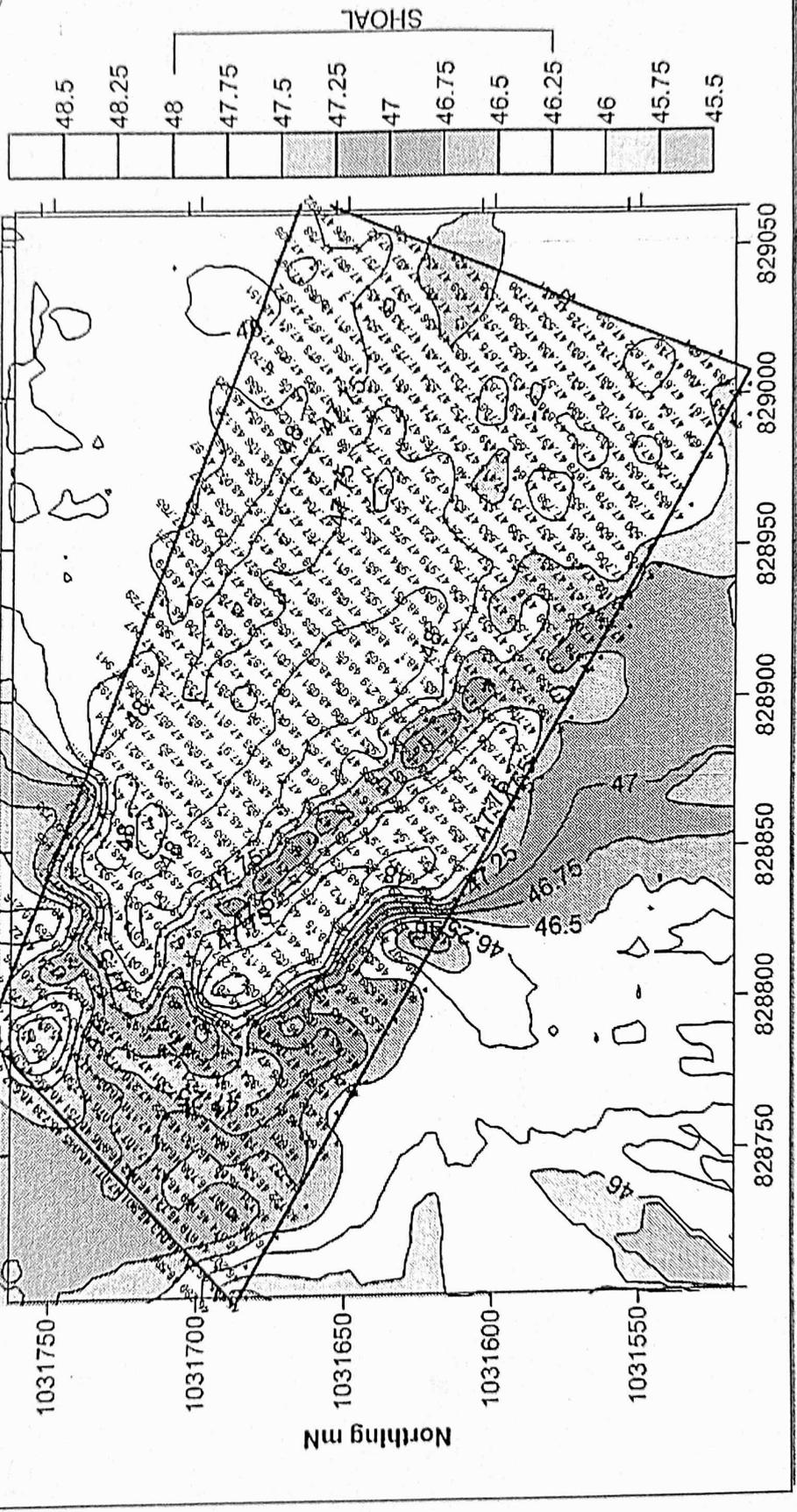
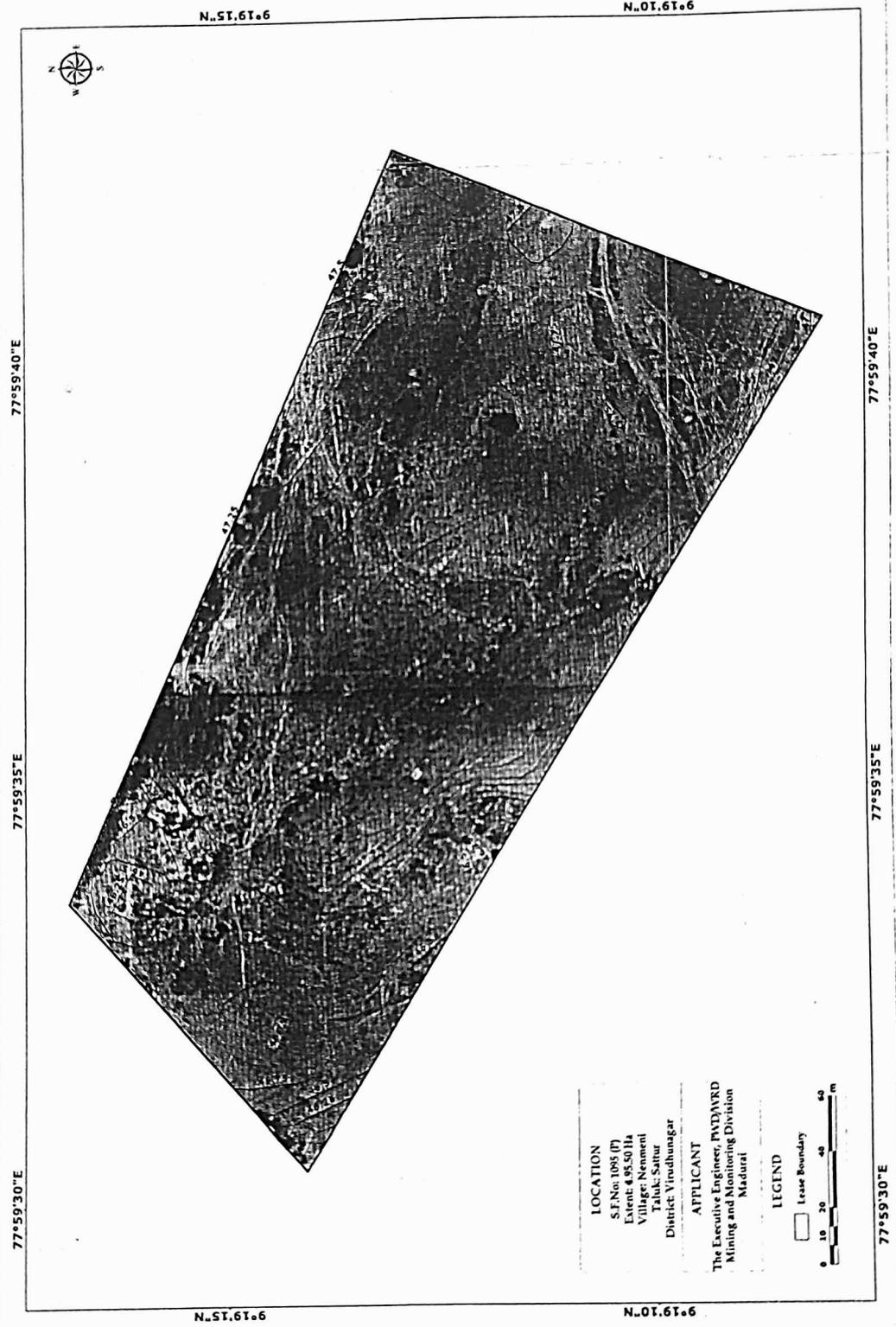


Fig.No.8: 2D Map with Contours



Ortho mosaic image of lease area showing contour lines over Sand Deposit



LOCATION
 S.F.No 1085 (T)
 Extent 495.50 Ha
 Village: Nenmeti
 Taluk: Sattur
 District: Virudhunagar

APPLICANT
 The Executive Engineer, PWD/ARD
 Mining and Monitoring Division
 Madurai

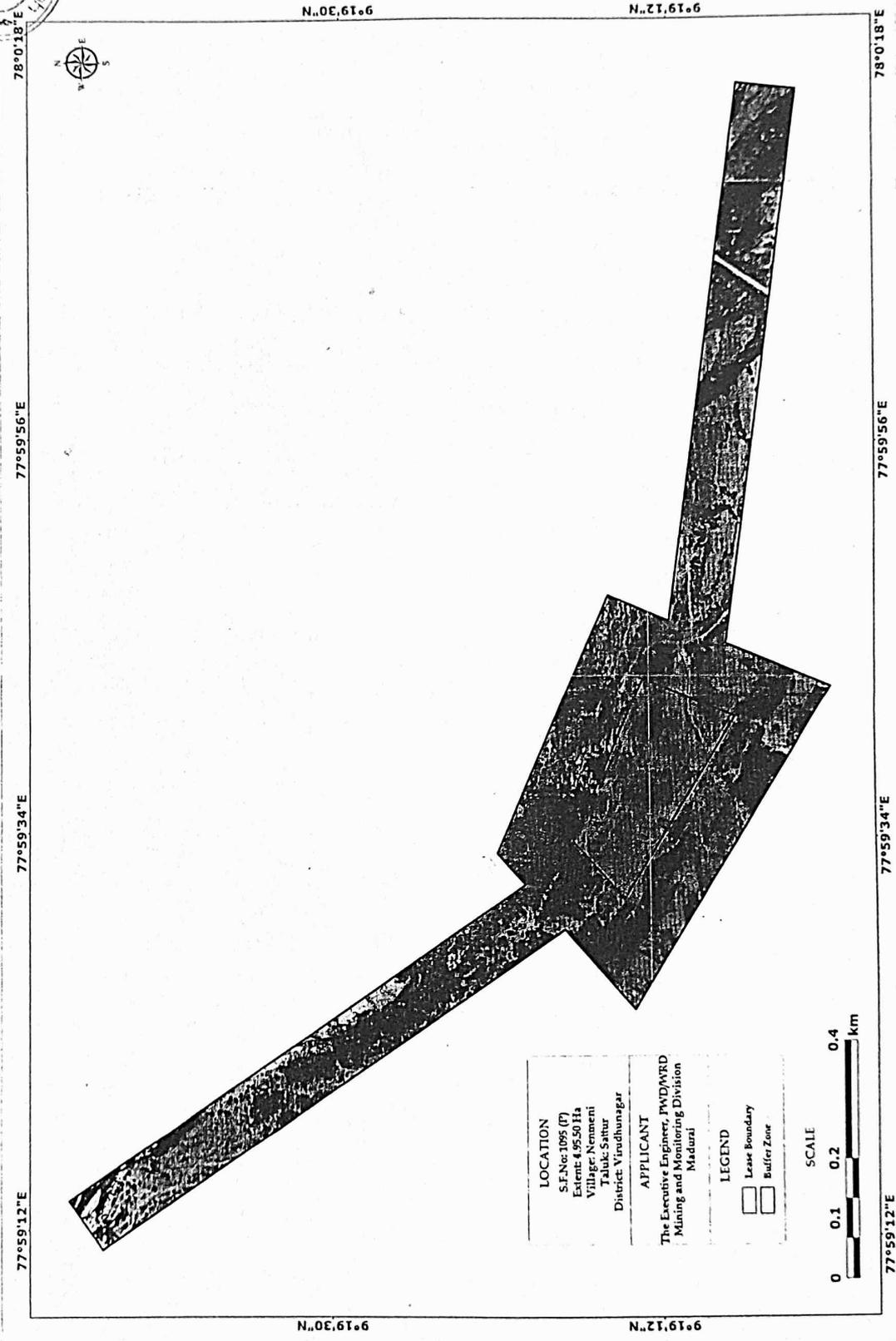
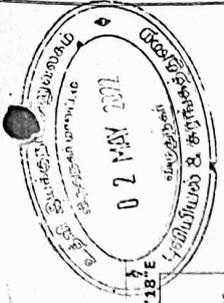
LEGEND
 □ Lease Boundary

0 10 20 40 60 m

Prepared by

Fig.No.9: Ortho Mosaic Image of Lease area showing contour lines.
 (Developed by Photogrammetry & GIS software with XYZ data)

Drone images showing extent of Survey and lease area (1km upstream, 1km downstream and 100m bufferzone)



LOCATION
 S.E.No:1095 (P)
 Extent: 4.9550 Ha
 Village: Nemeneni
 Taluk: Sattur
 District: Vindhanagar

APPLICANT
 The Executive Engineer, PWD/MRD
 Mining and Monitoring Division
 Madurai

LEGEND
 [Dark Pattern Box] Lease Boundary
 [White Box] Buffer Zone



Prepared by

Fig.No.10: Drone Image showing 1Km Upstream, Downstream and 100m Buffer Zone on River Bank Direction



ELEVATION IN MTS ABOVE MSL

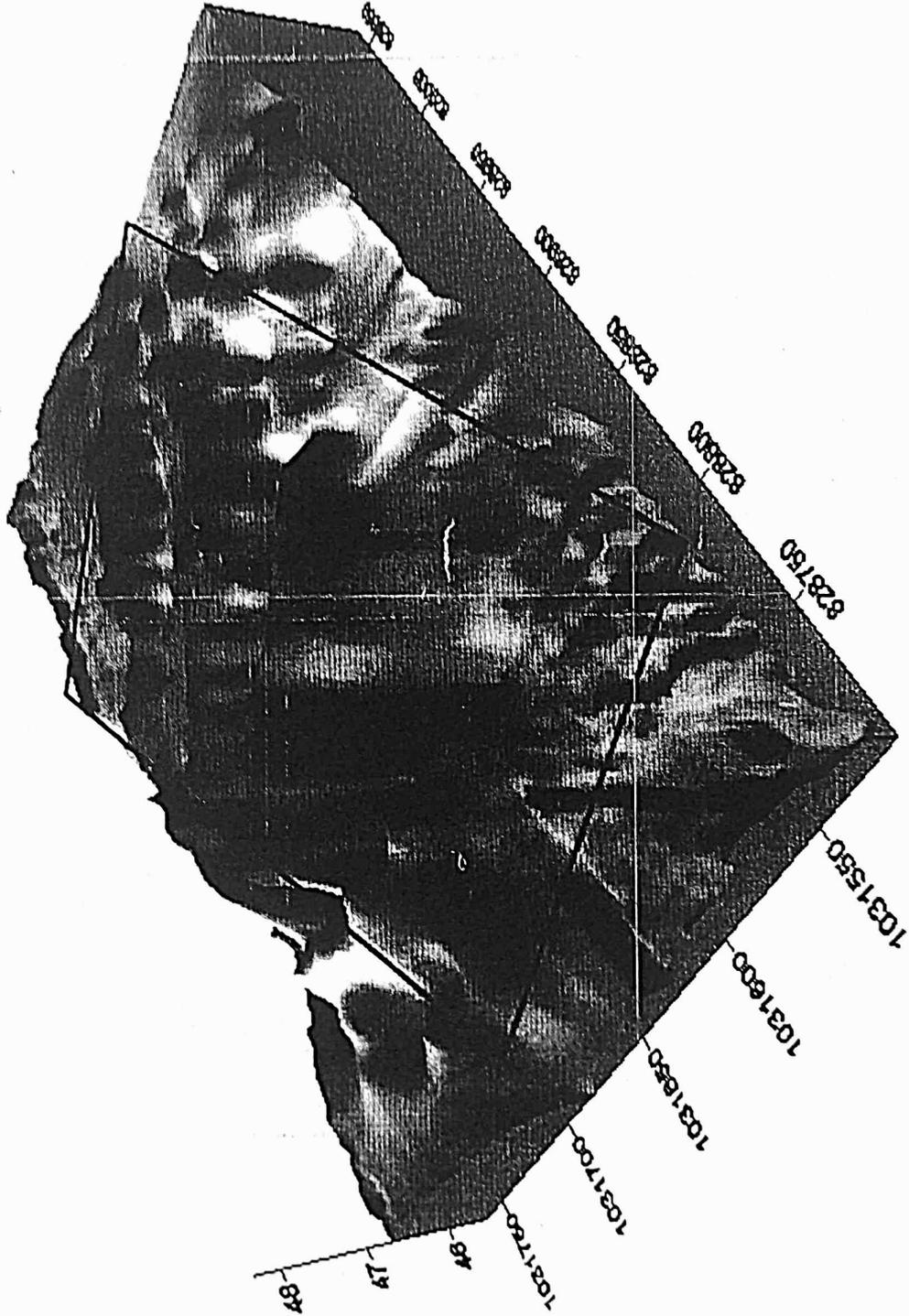
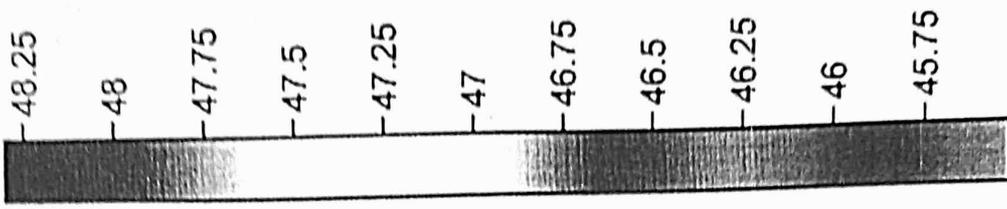


Fig.No.11: 3D Block Diagram of Lease Area and 100m Buffer showing elevation

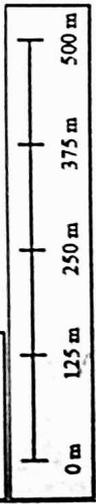
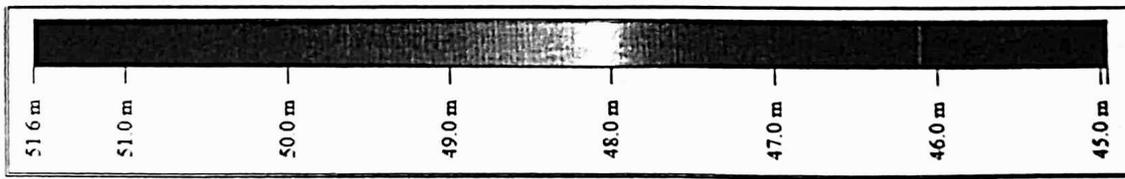
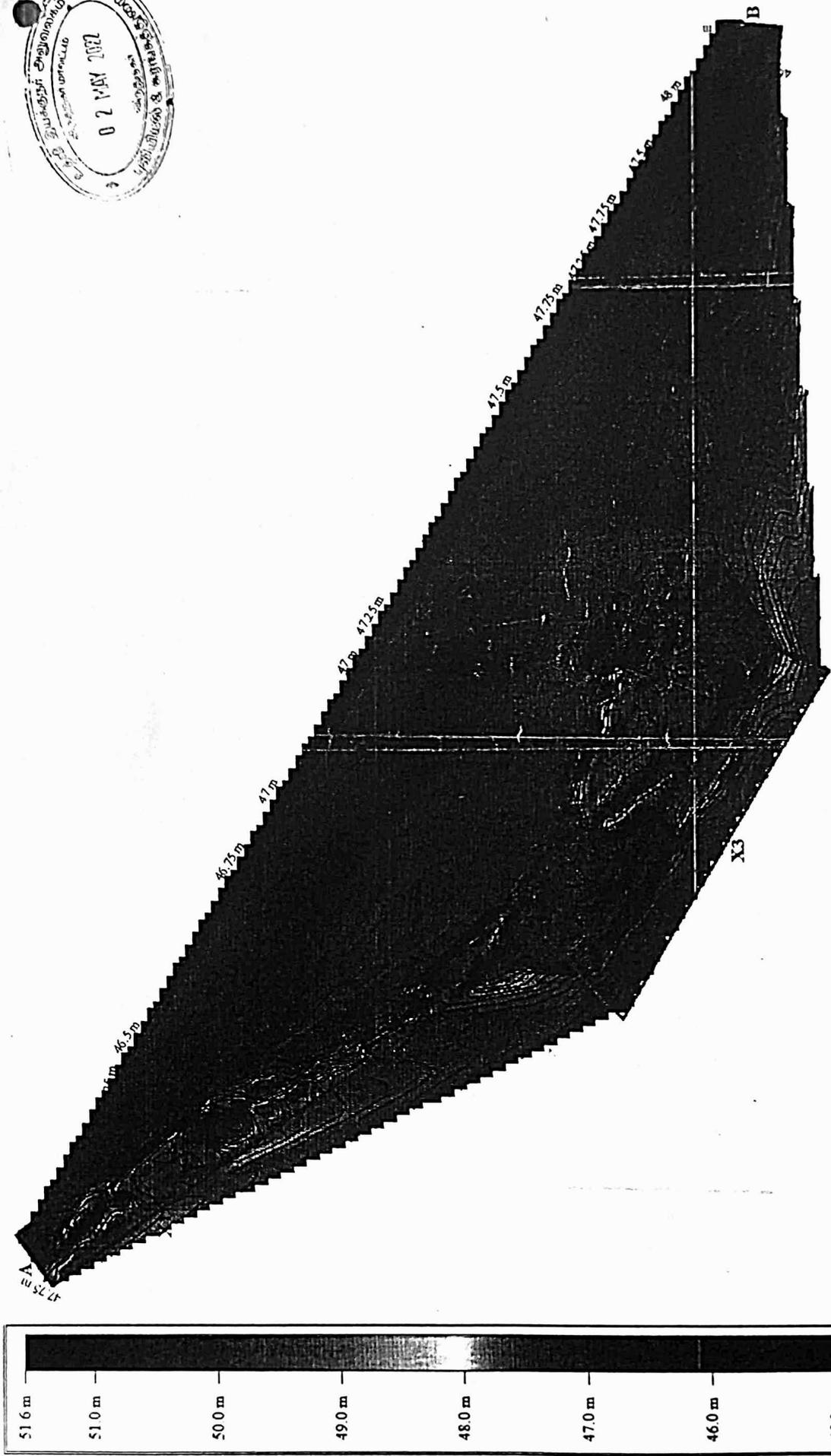
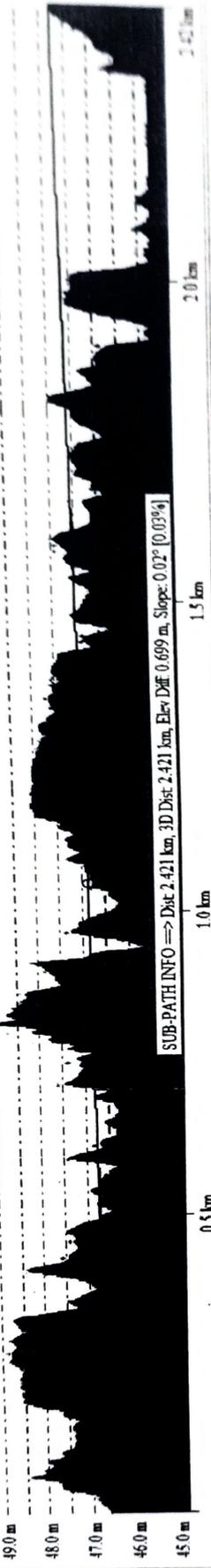


Fig.No.13: Image showing DTM Modeling.

To Pos: 828296.843, 1031459.190

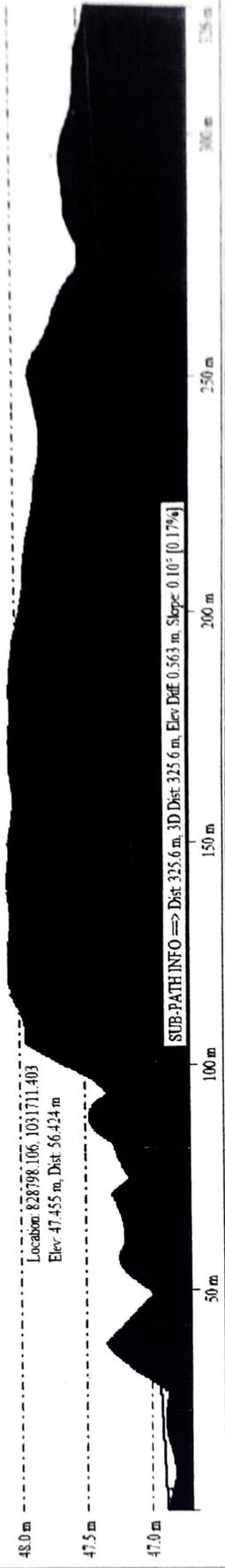
Location: 829506.633, 1031531.470
Elev: 47.999 m, Dist: 1.845 km



Longitudinal Section A-B

To Pos: 829609.524, 1031591.200

Location: 828798.106, 1031711.403
Elev: 47.455 m, Dist: 36.424 m

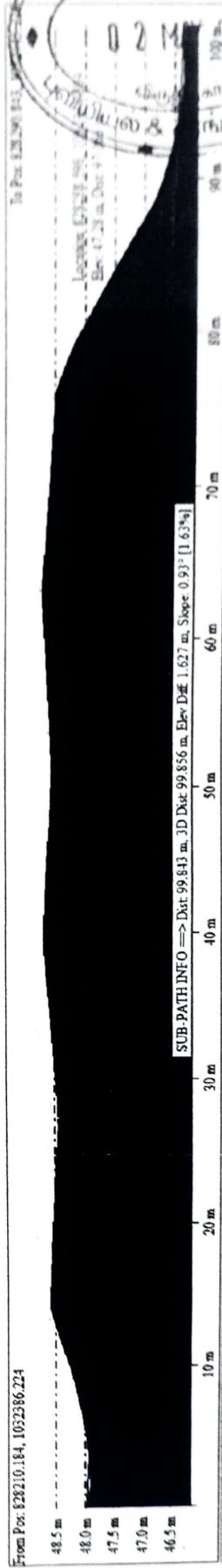


Cross Section along C-D

From Pos: 828210.184, 1032386.224

To Pos: 828296.843

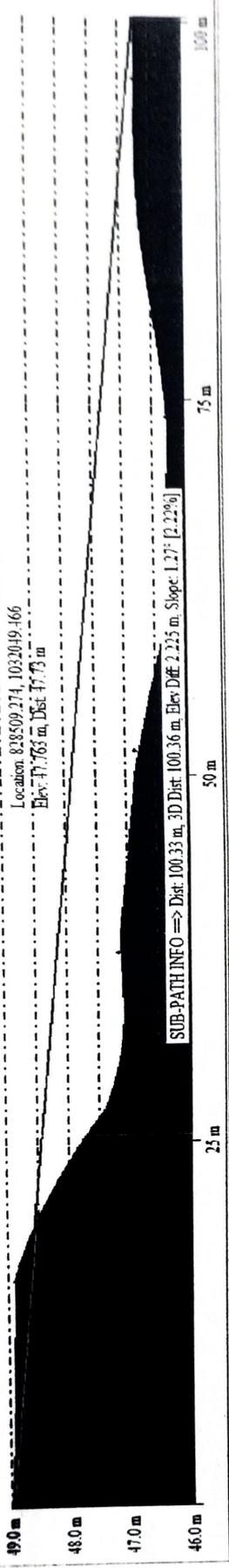
Location: 828296.843
Elev: 47.20 m, Dist: 86.2 m



Cross Section along XI-YI

To Post: 828454 709 1031503.6088

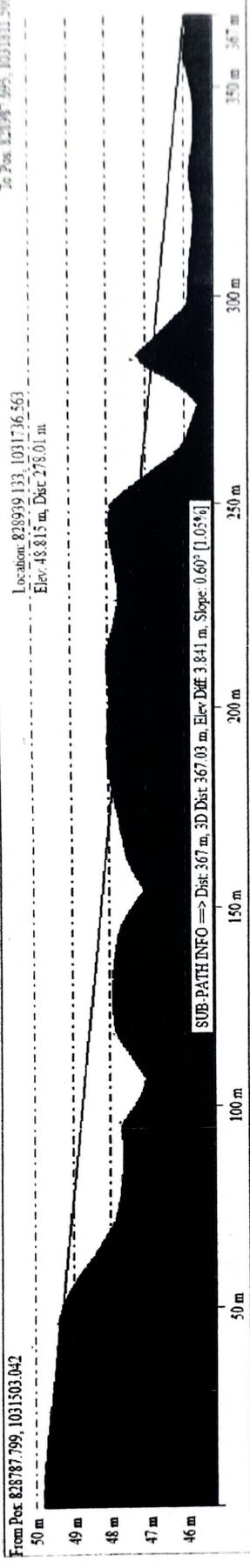
From Post: 828468 053, 1031502.310



Cross Section along X2-Y2

From Post: 828787 799, 1031503.042

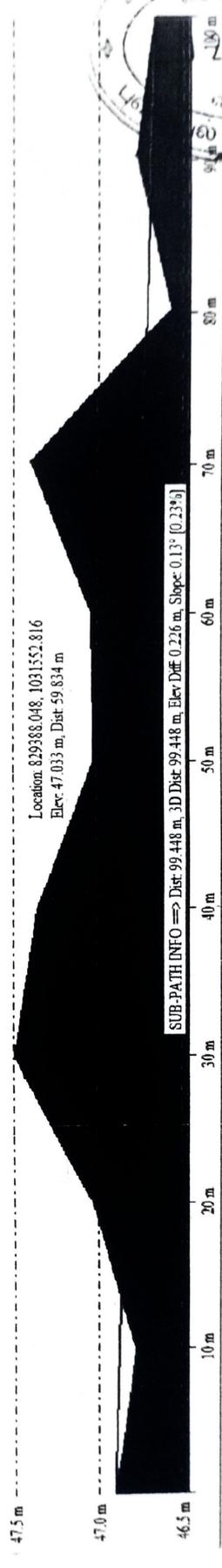
To Post: 829398 995, 1031811 590



Cross Section along X3-Y3

From Post: 829381 951, 1031493 237

To Post: 829392 081, 1031592 319



Cross Section along X4-Y4

