DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

For

JAKKERY COLOUR GRANITE QUARRY

OVER AN EXTENT OF 27.04.5 Ha.

(Schedule 1(a) Mining of Minerals 'B1' (Violation) Category)

Located at

Survey No's	**: 486(Part) & 736/4**
Village	**: Jakkery**
Taluk	**: Denkanikottai**
District	**: Krishnagiri**
State	**: Tamil Nadu**

By

M/s. Tamil Nadu Minerals Limited

No. 31, Kamarajar Salai, Chepauk, Chennai–600005.

ToR Id No. TO24B0108TN5942228N dated:21.09.2024

Baseline period: March 2024 to May 2024

Purpose of report: Submission for Public Hearing

EIAConsultant

M/s. EHS360 Labs Private Limited

Ashok Nagar, Chennai

NABETCertificate No. NABET/EIA/22-25/IA 0098_Rev.01 validity 24th June 2025

NOVEMBER 2024

PREFACE

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

For
"COLOUR GRANITE QUARRY OVER AN EXTENT OF 27.04.5 Ha."
Government Poramboke Land
Located in SF No. 486(Part) & 736/4, Jakkery Village,
Denkanikottai Taluk, Krishnagiri District,
Tamil Nadu, India.

For and on behalf of M/s. EHS360 Labs Pvt. Ltd.,

Approved by: Santhosh kumar. A
Signature:
Designation: CEO
Date: 07.11.2024

The report has been prepared in line with the prescribed ToR under violation with public hearing vide Identification No. TO24B0108TN5942228N dated:21.09.2024 issued by SEIAA-Tamil Nadu. This report has been prepared by M/s EHS360 Labs Private Ltd with all reasonable skill, care, and diligence within the terms of the contract with the project proponent.

Document Control			
Name of the Document	Draft Environmental Impact Assessment report for M/s. Tamil Nadu Minerals Limited, Colour granite quarry over an extent of 27.04.5 Ha Located at SF No. 486(Part) & 736/4, Jakkery Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu, India.		
Document No.	EHSL/EIA-PH/1(a)/032/Oct/2024	**Issue No:**	01
		Date:	07.11.2024

DISCLAIMER & DECLARATION:

This report has been prepared by M/s. EHS360 Labs Pvt. Ltd. for obtaining Environmental Clearance as per ToR under violation with public hearing issued by SEIAA-TN. Information provided in this report (unless attributed to references) shall not be copied or used without the written consent of M/s. EHS360 Labs Pvt. Ltd. Compliance The Environmental Impact Assessment & Environmental Management Plan have been prepared with compliance of Terms of Reference under violation with public hearing as per the Generic Structure and Process described in Annexure-III of EIA Notification 2006 and MoEFCC Office Memorandum J-11013/41/2006-IA. II (I) Dated.04.08.2009.

DECLARATION BY THE PROPONENT

(Compliance to MoEF&CC Office Memorandum J-11013/41/2006-IA. II (I) Dated.04.08.2009)

I, Dr.E.Ganesan, Deputy Manager (Mining Lease)of M/s Tamil Nadu Minerals Limited gives this declaration/ undertaking to the effect that the EIA report preparation has been undertaken in the compliance with Terms of Reference with public hearing (ToR for the Proposed Colour granite quarry over an extent of 27.04.5 Ha Located at SF No. 486(Part) & 736/4, Jakkery Village,Denkanikottai Taluk, Krishnagiri District, Tamil Nadu, India and the information and content provided in the report are factually correct.

The Environmental Impact Assessment & Environmental Management Plan have been prepared as per the Generic Structure and Process described in Annexure-3 of EIA Notification 2006.

For Tamil Nadu Minerals Ltd

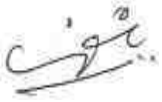
Deputy Manager (ML)
Authorized Signatory

DECLARATION OF EXPERTS CONTRIBUTING TO THE EIA:

Declaration by Experts Contributing to Draft Environmental Impact Assessment for the ***"M/s. Tamil Nadu Minerals Limited, Colour granite quarry over an extent of 27.04.5 Ha Located at SF No. 486(Part) & 736/4, Jakkery Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu, India".***

I hereby certify that I was a part of the EIA report in the following capacity that developed the above said EIA.

EIA Coordinator



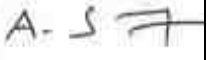
Name: Tatiparthi Rajani

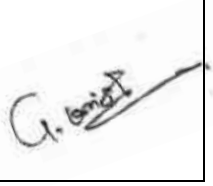
Date: 07.11.2024

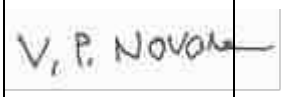
Period of Involvement: December 2023 to till date.

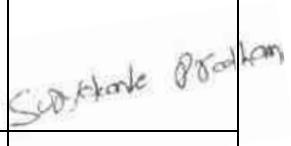
Contact Information : M/s. EHS360 Labs Pvt. Ltd.
10/2 - Ground Floor, 50th Street, 7th Avenue,
Ashok Nagar, Chennai - 600083
Phone: 044 45493644:
Email id: santhosh@ehs360labs.com
Website: www.ehs360labs.com

Functional Area Experts (FAEs):

S. No.	FAs	Name of the Expert/s	Involvement (Period &Task)	Signature
1.	AP	Mr. Santhosh kumar A	**Period:** December 2023 to till now **Task:** Selection ofmonitoring locations, Supervision of air quality monitoring, identifiction and assessing quantum of emisssion, Identification of most suitable control device for reducing process emission at source and contribution to EIA documentation	
		Tatiparthi Pranay Kumar (FAA)	**Period:** December 2023 to till date **Task:** Site visit and Kick of meeting with client. Assisting with FAE during Selection ofmonitoring locations, Identification of most suitable control device for reducing process	

			emission at source and contribution to EIA documentation	
2.	AQ	Ms. Tushali Jagwani	**Period:** January 2024 to till now **Task:** Developing meteorological data with collected secondary data, identification of impacts, finalization of mitigation measures and contribution to EIA documentation	
		Monishadevi. B (FAA)	**Period:** December 2023 to till now **Task:**Assistance to FAE during Developing meteorological data with collected secondary data, Preparation of Emission Inventory, AERMOD Modelling for Proposed activities identification of impacts and contribution to EIA documentation	
3.	WP	Mrs. Tatiparthi Rajani	**Period:** December 2023 to till date **Task:**Identification of sampling locations for surface water , Coordination with Lab team during the collection of Sampling and preservation & Ground water samples,Verification of analysis results and Ioniic balance/correlation of parameters. Incorporation of results in the EIA report. Identification of Impacts pollution evaluation of water control management, finalization of mitigation measures and contribution to EIA documentation	
		Tatiparthi Pranay Kumar (FAA)	**Period:** December 2023 to till date **Task:** Assistance to FAE during auditing water use, Identification of Impacts pollution evaluation of water control management and contribution to EIA documentation.	
4.	SHW (SW&HW)	Mrs. Tatiparthi Rajani	**Period:** December 2023 to till date **Task:** Identification of waste generation and suggestion disposal methods, proposed adequate Mitigation measure for management of hazardous waste and contribution to EIA documentation	
		Mr. Krishnan (FAA)	**Period:** January 2024 to till now **Task:** Assistance to FAE during Studying adequacy of Mitigation measure for management of haardous waste and contribution to EIA documentation	

5.	SE	Mrs. Anitha Reddy	**Period:** December 2023 to till date **Task:** Collection ofsecondary and primary from thesurrounding area/villages of the proposed project for Impact identification and mitigation measures for incorporating to EIA documentation	
		Srimathi Velu (FAA)	**Period:** December 2023 to till date **Task:** Collection ofsecondary and primary data from thesurrounding area/villages of the proposed project for Impact identification and contributing to the EIA documentation	
6.	EB	Mr. G. Raja Reddy	**Period:** December 2023 to till date **Task:** Site visit and conduct of ecological survey, assessment ofthe impacts of proposed project activities on the biological environment and contribution to EIA documentation	
		Mrs. Tatiparthi Rajani	**Period:** December 2023 to till date **Task:** Assisting FAE during Site visit, conduct of ecological survey, and contribution to EIA documentation	
7.	HG	Mr. Mallikarjuna Rao	**Period:** January 2024 to till now **Task:** Understanding and representing groundwater conditions, Supervision of groundwater sampling locations, finalization ofsurvey findings, identification of impacts, suggestion of mitigationmeasures and contribution to the EIA documentation.	
8.	GEO	Mr. Mallikarjuna Rao	**Period:** January 2024 to till now **Task:** Geological features & formations, topography & Lithology of the 10 km radius area and lease area	
9.	NV	Mr. Vivek Prabhakar Navare	**Period:** January 2024 to till now **Task:** Site visit and checking of noise sampling results and predict the vibrations due Blasting and identification of Impacts on surrounding structures and analysis of data identification of impacts and proposed mitigation measures, and contribution to EIA documentation	
10.	LU	Mrs. Anitha Reddy	**Period:** December 2023 to till date **Task:**Generation and analysis of datarelated to landuse pattern,development of landuse maps of study area using ArcGIS / related tools, site visit for ground truth survey, finalization of landuse maps contribution to EIA documentation	

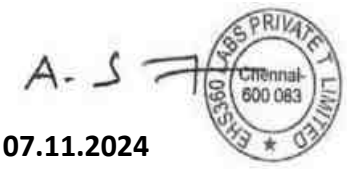
		Indhumathi. D (TM)	**Period:** December 2023 to till now **Task:**Assistance to FAE during Generation and analysis of datarelated to landuse pattern,development of landuse maps of study area using ArcGIS / related tools, site visit for ground truth survey, finalization of landuse maps contribution to EIA documentation	
11.	RH	Mr. Suryakanta Pradhan	**Period:** January 2024 to till now **Task:**Identification of hazards and hazardous substance,preparation of impacts & mitigation measures for proposed project	
		Monishadevi B (FAA)	**Period:** December 2023 to till now **Task:** Assesting FAE duringIdentification of hazards and hazardous substance,preparation of impacts & mitigation measures, and contribution to EIA documentation	
12.	SC	Dr. Aparna Chittajallu	**Period:** January 2024 to till now **Task:**Understanding and representingsoll conditions, supervision of soilsampling locations, finalization ofsurvey findings, identification of impacts, suggestion of mitigationmeasures and contribution to the ELA documentation	
		Soosan Steffy (TM)	**Period:** December 2023 to till date **Task:** Assisting to FAE during studies of finalization of survey findings, identification of impacts, suggestion of mitigationmeasures and contribution to the EIA documentation	

LU - Land Use
AP - Air Pollution monitoring, prevention, and control
AQ - Meteorology, air quality modeling and prediction
WP - Water pollution monitoring, prevention, and control
EB - Ecology and biodiversity
NV - Noise& Vibration
SE - Socioeconomics
HG - Hydrology, ground water and water conservation
GEO - Geology
RH - Risk assessment and hazards management
SHW - Solid and hazardous waste management
SC - Soil Conservation

DECLARATION BY THE HEAD OF THE ACCREDITED CONSULTANT ORGANIZATION/AUTHORIZED PERSON

I, Mr. Santhoshkumar.A hereby, confirm that the above-mentioned experts prepared the Draft EIA/EMP report for "M/s. Tamil Nadu Minerals Limited, Colour granite quarry over an extent of 27.04.5 Ha Located at SF No. 486(Part) & 736/4, Jakkery Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu, India".

I hereby certify that I was a part of the EIA in the following capacity that developed the above EIA. I also confirm that the consultant organization shall be fully accountable for any misleading information mentioned in the statement.

Signature	: 
Date	**: 07.11.2024**
Name	**:** Mr. Santhosh Kumar. A
Designation	**:** Chief Executive Officer
Name of the EIA Consultant Organization	**:**M/s. EHS360 Labs (P) Ltd, Chennai
NABET Certificate No & validity	**:** NABET/EIA/22-25/IA 0098_Rev No.01 valid up to- June 24th,2025

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LIST OF ABBREVIATIONS

AAQ	Ambient Air Quality
AAQM	Ambient Air Quality Monitoring
AGL	Above Ground Level
AMSL	Above Mean Sea Level
BGL	Below Ground Level
CPCB	Central Pollution Control Board
CER	Corporate Environmental Responsibility
CSR	Corporate Social Responsibility
DMP	Disaster Management Plan
EIA	Environmental Impact Assessment
EMC	Environmental Management Cell
EMP	Environmental Management Plan
GLC	Ground Level Concentration
GO	Government Order
ISO	International Organization for Standardization
IUCN	International Union for Conservation of Nature
O. B	Over Burden
S. B	Side Burden
kWh	Kilowatt Hour
MSDS	Material Safety Data Sheet
MMR	Metalliferous Mines Regulations
MoEF&CC	Ministry of Environment, Forest, and Climate Change
NAAQS	National Ambient Air Quality Standard
NABET	National Accreditation Board for Education and Training
QCI	Quality Council of India
R & D	Research & Development
RA	Risk Assessment
ROM	Run of Mine
SOM	Scheme of Mining
SEIAA	State Environmental Impact Assessment Authority
SEAC	State Expert Appraisal Committee
TDS	Total Dissolved Solids
SEAC	State Expert Appraisal Committee
TOR	Terms of Reference

1 INTRODUCTION

1.1 Project background

M/s. Tamil Nadu Minerals Ltd, (An undertaking of Government of Tamil Nadu) was established in the year 1978, to carry out systematic mining and development of different minerals all over the State. Ever since its inception TAMIN has developed expertise in the mining of granite dimensional stones of different varieties including Black Granite(Dolerite), Kashmir White(Leptynite), Paradiso(Migmatite Gneiss), Green Onyx(Syenite-porphyry), Red wave (Pink Feldspathic Gneiss) Colombo Juparana(Pegmatitic Granite Gneiss of magmatic origin), Raw silk(Yellow Feldspathic Leptynite) and a number of other coloured granite varieties apart from other industrial minerals viz., Quartz and Feldspar, Graphite, Limestone, Vermiculite etc,.

The Color granite quarry has been set up over a total extent area of 27.04.5 Ha located at S. F. No.486 (Part) & 736/4, Jakkery Village, Denkanikottai Taluk, KrishnagiriDistrict, Tamil Nadu State. Quarry Land is classified as Government Poramboke land andlease obtained by Tamil Nadu Minerals Limited (TAMIN).

The lease was granted over an extent of 27.04.5 Ha. vide G.O. Ms. No. 238 Industries (MMEI)Department, dated: 17.03.1999. The period of lease is for 20 years. The lease was valid from 21.06.1999 up to 20.06.2019.

The Mining plan was approved by the Commissioner of Geology & mining, Chennai vide letter No. 4997/MM9/2003, dated 09.02.2005. Modified scheme of mining–I pertaining to the years2010-2011 to 2014-2015 due to increase of production vide this office Lr. No.15657/ML2/2009, dated 30.09.2009. Taking into consideration deemed approval of both mining plan under Rule 17 (6) of GDCR 1999 and the modified scheme of mining- I, underRule 18 (5) of GCDR 1999, the present scheme of mining –II pertaining to the years 2015-2016 to 2019-2020 has been prepared and submitted to the Department of Geology andMining for approval, vide this office letter RC. No 10319/ML2/2014 dated 10.09.2014.

M/s Tamil Nadu Mineral Limited applied for seeking Environmental Clearance at Tamil Nadu-SEIAA vide letter no.Rc.No.3446/ML3/2015 dated 08.09.2015. ToR obtained from SEIAA-TN vide Letter No. SEIAA-TN/F.No. 3891/SEAC-LXVIII/TOR-232/2015 dated 06.11.2015. As per obtained ToR, Public Hearing is conducted on 02.12.2016.

The project falls under B1 violation category due to operational without Environmental Clearanceas per MoEF & CC Gazette Notification No. S.O.804 (E) dated 14th March 2017. The ECApplication submissions under violation at MoEF & CC vide Proposal NoIA/TN/MIN/68345/2017 dated: 11.09.2017.

As per MoEF & CC Gazette Notification No.S.O.804 (E) dated 14th March, 2017 and itssubsequent amended gazette notification no. S.O. 1030 (E) dated 8th March, 2018 and OM F.No. Z-11013/22/2017-IA.II (M) dated 15th & 16th March, 2018, MoEF&CC transferred the proposal to SEIAA-TN vide New Proposal No. SIA/TN/MIN/27166/2018 dated: 02.06.2018.The EC application is submitted under violation at TN SEIAA vide ProposalNo.SIA/TN/MIN/23921/2018 dated 09.04.2018.ToR was issued Lr No. SEIAA-TN/F-3891/TOR-408/2018 dated 22.05.2018 for the preparation of EIA/EMP report. Based on the previous Baseline study and PH on 02.12.2016 final EIA/EMP report is submitted in SEIAA-TN. PoD is submitted vide TAMIN Letter Rc. No.3446/ML3/2015 dated: 27.02.2019.

The lease of the quarry expired on 20.06.2019. During the EC Violation period (15.01.2016 to 10.01.2017), TAMIN had transported 1634.603 m^3. Hence, TAMIN remitted the 100% sale value of the mineral to the tune of Rs.2.01Cr. (Rs.2,01,74,270/-). Accordingly, the Director of Geology and Mining has issued NoC to get EC vide Letter Rc. No. 553/MM4/2020, dt. 27.07.2020. TAMIN obtained the quarry lease renewal vide Letter Rc. No.643/ML2/2018 dated: 21.04.2018. HACA recommended during 80th Meeting held on 26.06.2023 vide Town and Country Planning Department Letter Roc. No. 11938/2023/HACA dated: 26.07.2023.

The Government of Tamil Nadu has issued the precise area communication letter to furnish the approved Mining plan under Go. TN, Natural Resources (MME.1) Department for quarrying Colour Granite over an extent of 27.04.5 Ha of Government poramboke land in SSF No. 486(Part) & 736/4, Jakkery Village, Denkanikottai Taluk, Krishnagiri District for a period of 20 years vide Govt.Letter No. 5883890/MME.2/2023-1, dated: 14.02.2024. The Precise Area Communication Letter is enclosed as **Annexure-3.**

Accordingly, TAMIN submitted the Mining Plan for the subject area and the same was approved by the Commissionerate of Geology and MiningUp to lease period as pr Rule 18(1) GCDR,1999Chennai vide Letter Rc. No. 8664/MM4/2019, dated: 22.05.2024. The mining plan approval letter is enclosed as **Annexure-4**. The mining plan is enclosed as **Annexure-6**. TAMIN has applied for ToR vide Online proposal No.SIA/TN/MIN/488460/2024 dated: 18.07.2024. Accordingly, TAMIN remitted the amount of Rs. 3.5 Lakh Processing fee as per New G.O vide SEIAA-TNF.No.10771/2024, dt. 21.03.2024.

The proposal was appraised under violation during 492nd SEAC Meetingheld on 29.08.2024 vide SEIAA No. 11115, Unit: VI, Online Proposal No. SIA/TN/MIN/488460/2024.ToR was issued under violation with Public Hearing vide identification No. TO24B0108TN5942228N dated: 21.09.2024 for the preparation of EIA/EMP report.

1.2 Identification of Project & Project Proponent

1.2.1 Project

The existing Color Granite Quarry has a lease area over an extent of 27.04.5 ha located inS.F. No. 486 (Part) & 736/4 located at Jakkery Village, Denkanikottai Taluk, KrishnagiriDistrict, lies in the latitude of 12°33'54.13" N (SF. No. 486) & 12°33'39.44" N (SF. No. 736/4) and longitude of 77°52'14.17" E (SF. No. 486) & 77°52'15.40" E (SF. No. 736/4). The area ismarked in the survey of India Topo sheet No.57-H/14, H/15. The Color granite quarryingoperation is proposed to carry out by opencast semi mechanized method by formation ofbenches. Benches are proposed with a height of 6m and width bench not less than the height. The area applied for quarry lease is exhibits hilly terrain; the altitude of the area is ≃868m S.F. No (486(P)) AMSL and ≃786m (S. F. No 736/4) AMSL.

1.2.2 Project Proponent

Tamil Nadu Minerals Ltd (TAMIN) is a wholly owned Undertaking of Government of TamilNadu has been established in the year 1978. It entered the international granite market in theyear 1979 and has secured a steady market for dimensional blocks of black and other colourmaterials in countries like Japan, Germany, Italy, Australia, UK, Switzerland, Holland, USAetc., TAMIN is only organization recognized by Bureau of Indian Standard for manufacture andsupply of I.S. Sand all over the country. TAMIN has developed expertise in the mining ofgranite dimensional stones of different varieties including black granite (Dolerite), Kashmirwhite (Leptynite), Paradiso (Migmatite gneiss), Green onyx (Syenite - porphyry) Red wave(Pink Feldspathic gneiss) Colombo Juparana (Pegmatitic granite gneiss of migmatitic origin),Raw silk (Yellow feldspathic Lepthnite) and a number of other colored granite varieties apartfrom other industrial minerals viz. quartz and feldspar, graphite, lime stone, silica sand,vermiculite, etc.

1.3 Letter of Intent (LoI) & Mining Plan approval details

i. The Government of Tamil Nadu has issued the precise area communication letter to furnish the approved Mining plan as per Go. TN, Natural Resources (MME.1) Department for quarrying Colour Granite over an extent of 27.04.5 Ha of Government poramboke land in S SF No. 486(Part) & 736/4, Jakkery Village, Denkanikottai Taluk, Krishnagiri District for a period of 20 years vide Govt. Letter No. 5883890/MME.2/2023-1, dated: 14.02.2024. The Precise Area Communication Letter is enclosed as **Annexure-3**.

ii. Subsequently, the Mining Plan was submitted and approved by the Commissionerate of Geology and Mining, Chennai videsLetter Rc. No. 8664/MM4/2019, dated: 22.05.2024. The mining plan approval letter is enclosed as **Annexure-4.**

1.4 Land Acquisition Status

The entire mine lease area of 27.04.5 Ha is Government land which is leased by TAMIN. The quarry the precise area communication letter is enclosed as **Annexure–3**. Details of the project site is given in the **Table 1-1.**

Table 1-1Land Use Description

District and State	Taluk	Village	S.F. No	Area (Ha)	Land Classification
Krishnagiri District, Tamil Nadu State	Denkanikottai	Jakkery	486(Part) & 736/4	27.04.5	Government Land

1.5 Purpose and status of the report

The proposed site is located at S.F.No.486 (Part) & 736/4, Jakkery Village, DenkanikottaiTaluk, Krishnagiri District, Tamil Nadu State. The lease area for mining of color granite is27.04.5 Ha. The quarry land is classified as Government Poramboke land. The quarry lease was applied, quarry lease videG.O.Ms. No. 238, Industries (MME-1) dept dated 17.03.1999 for 20 years & the lease period isvalid from 21.06.1999 to 20.06.2019.

The project falls under B1 violation category due to operational without Environmental Clearanceas per MoEF & CC Gazette Notification No. S.O.804 (E) dated 14th March 2017. The ECApplication submissions under violation at MoEF & CC vide Proposal NoIA/TN/MIN/68345/2017 dated: 11.09.2017.

As per MoEF & CC Gazette Notification No.S.O.804 (E) dated 14th March, 2017 and itssubsequent amended gazette notification no. S.O. 1030 (E) dated 8th March, 2018 and OM F.No. Z-11013/22/2017-IA.II (M) dated 15th & 16th March, 2018, MoEF&CC transferred the proposal to SEIAA-TN vide New Proposal No. SIA/TN/MIN/27166/2018 dated: 02.06.2018.The EC application is submitted under violation at TN SEIAA vide ProposalNo.SIA/TN/MIN/23921/2018 dated 09.04.2018.ToR was issued Lr No. SEIAA-TN/F-3891/TOR-408/2018 dated 22.05.2018 for the preparation of EIA/EMP report. Based on the previous Baseline study and PH on 02.12.2016 final EIA/EMP report is submitted in SEIAA-TN. PoD is submitted vide TAMIN Letter Rc. No.3446/ML3/2015 dated: 27.02.2019.

The lease of the quarry expired on 20.06.2019. During the EC Violation period (15.01.2016 to 10.01.2017), TAMIN had transported 1634.603 m^3. Hence, TAMIN remitted the 100% sale value of the mineral to the tune of Rs.2.01Cr. (Rs.2,01,74,270/-). Accordingly, the Director of Geology and Mining has issued NoC to get EC vide Letter Rc. No. 553/MM4/2020, dt. 27.07.2020. TAMIN obtained the quarry lease renewal vide Letter Rc. No.643/ML2/2018 dated: 21.04.2018. HACA

recommendedduring 80th Meeting held on 26.06.2023 vide Town and Country Planning Department Letter Roc. No. 11938/2023/HACA dated: 26.07.2023.

The Government of Tamil Nadu has issued the precise area communication letter to furnish the approved Mining plan as per Go. TN. Natural Resources (MME.1) Department for quarrying Colour Granite over an extent of 27.04.5 Ha of Government poramboke land in SSF No. 486(Part) & 736/4, Jakkery Village, Denkanikottai Taluk, Krishnagiri District for a period of 20 years vide Govt.Letter No. 5883890/MME.2/2023-1, dated: 14.02.2024. The Precise Area Communication Letter is enclosed as **Annexure-3.**

Accordingly, TAMIN submitted the Mining Plan for the subject area and the same was approved by the Commissionerate of Geology and Mining Up to lease period as pr Rule 18(1) GCDR,1999Chennai vide Letter Rc. No. 8664/MM4/2019, dated: 22.05.2024. The mining plan approval letter is enclosed as **Annexure-4**. The mining plan is enclosed as **Annexure-6**. TAMIN has applied for ToR vide Online proposal No.SIA/TN/MIN/488460/2024 dated: 18.07.2024. Accordingly, TAMIN remitted the amount of Rs. 3.5 Lakh Processing fee as per New G.O vide SEIAA-TNF.No.10771/2024, dt. 21.03.2024.

The proposal was appraised under violation during 492nd SEAC Meetingheld on 29.08.2024 vide SEIAA No. 11115, Unit: VI, Online Proposal No. SIA/TN/MIN/488460/2024.ToR was issued under violation with Public Hearing vide identification No. TO24B0108TN5942228N dated: 21.09.2024 for the preparation of EIA/EMP report.

1.6 Brief Description of the Project

1.6.1 Nature of the Project

The project falls under B1 violation category due to operational without Environmental Clearanceas per MoEF & CC Gazette Notification No. S.O.804 (E) dated 14th March, 2017. The ECApplication submissions under violation at MoEF & CC vide Proposal NoIA/TN/MIN/68345/2017 dated: 11.09.2017.

As per MoEF & CC Gazette Notification No.S.O.804 (E) dated 14th March, 2017 and itssubsequent amended gazette notification no. S.O. 1030 (E) dated 8th March, 2018 and OM F.No. Z-11013/22/2017-IA.II (M) dated 15th & 16th March, 2018, MoEF&CC transferred the proposal to SEIAA-TN vide New Proposal No. SIA/TN/MIN/27166/2018 dated: 02.06.2018.The EC application is submitted under violation at TN SEIAA vide ProposalNo.SIA/TN/MIN/23921/2018 dated 09.04.2018.ToR was issued Lr No. SEIAA-TN/F-3891/TOR-408/2018 dated 22.05.2018 for the preparation of EIA/EMP report. Based on the previous Baseline study and PH on 02.12.2016 final EIA/EMP report is submitted in SEIAA-TN. PoD is submitted vide TAMIN Letter Rc. No.3446/ML3/2015 dated: 27.02.2019.

The lease of the quarry expired on 20.06.2019. During the EC Violation period (15.01.2016 to 10.01.2017), TAMIN had transported 1634.603 m^3. Hence, TAMIN remitted the 100% sale value of the mineral to the tune of Rs.2.01Cr. (Rs.2,01,74,270/-). Accordingly, the Director of Geology and Mining has issued NoC to get EC vide Letter Rc. No. 553/MM4/2020, dt. 27.07.2020. TAMIN obtained the quarry lease renewal vide Letter Rc. No.643/ML2/2018 dated: 21.04.2018. HACA recommendedduring 80th Meeting held on 26.06.2023 vide Town and Country Planning Department Letter Roc. No. 11938/2023/HACA dated: 26.07.2023.

The Government of Tamil Nadu has issued the precise area communication letter to furnish the approved Mining plan as per Go. TN, Natural Resources (MME.1) Department for quarrying Colour Granite over an extent of 27.04.5 Ha of Government poramboke land in SSF No. 486(Part) & 736/4, Jakkery Village, Denkanikottai Taluk, Krishnagiri District for a period of 20 years vide Govt.Letter No. 5883890/MME.2/2023-1, dated: 14.02.2024. The Precise Area Communication Letter is enclosed as **Annexure-3.**

Accordingly, TAMIN submitted the Mining Plan for the subject area and the same was approved by the Commissionerate of Geology and Mining Up to lease period as pr Rule 18(1) GCDR,1999Chennai vide Letter Rc. No. 8664/MM4/2019, dated: 22.05.2024. The mining plan approval letter is enclosed as **Annexure-4**. The mining plan is enclosed as **Annexure-6**. TAMIN has applied for ToR vide Online proposal No.SIA/TN/MIN/488460/2024 dated: 18.07.2024. Accordingly, TAMIN remitted the amount of Rs. 3.5 Lakh Processing fee as per New G.O vide SEIAA-TNF.No.10771/2024, dt. 21.03.2024.

The proposal was appraised under violation during 492nd SEAC Meetingheld on 29.08.2024 vide SEIAA No. 11115, Unit: VI, Online Proposal No. SIA/TN/MIN/488460/2024.ToR was issued under violation with Public Hearing vide identification No. TO24B0108TN5942228N dated: 21.09.2024 for the preparation of EIA/EMP report.

1.6.2 Size of the Project

The total extent area of the lease for this quarry is 27.04.5 Ha, at S. F. No. 486 (Part) & 736/4, Jakkery Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu State. Quarry Land isclassified as Government Poramboke land and leased to by Tamil Nadu Minerals Limited (TAMIN).

The Geological reserves of Colour granite have been computed based on the Geological Plan & Sections up to the economically workable average depth of 30 m from the surface level and the top surface of the granite body works out to 37,00,465 m^3.

Mineable Reserves have been computed as 29,53,169 m^3 based on the Conceptual Plan and sections, the effective (Saleable) Mineable Reserves have been worked out as 7,38,292 $m^3$by applying the recovery factor 25% and mineable granite waste reserve 22,14,877 m^3 at recovery factor 75%. The maximum annual production per year would be 2,500 m^3 of Saleable and 10400 m^3 of ROM during

the first five years of the Mining plan period at the rate of 25% recovery. Open cast Semi mechanized method will be followed for proposed mining as per Mining plan.

During extraction of blocks, each bench will be 6m height with vertical slope for dimensional cutting. The quantum of excavation is estimated to be 10,400 m^3 of ROM @25% recovery up to an average workable depth of 30 m. The generation of total waste is estimated to be about 45,086 m^3 (Granite Rejects 31,204 m^3 and over burden 13,882 m^3).

Total waste to be generated during the five years of Mining Plan period will be 31,204 m^3. The waste material will be dumped on the western side of SF. No. 486(Part) of the lease applied boundary. The dumps will be maintained not exceeding 5m height and the angle of slope of dumps will be at 45° from horizontal. All the sectional plates are enclosed as **Annexure-6**. Estimated Colour Granite Reserves is given in **Table 1-2.**

Table 1-2 Estimated Colour Granite Reserves

S. No	Geological Reserves	Mineable Reserves	Mineable Saleable Granite Reserves @ 25% Recovery	Mineable Saleable Granite Waste Reserves @ 75% Recovery
1	37,00,465	29,53,169	7,38,292	22,14,877

Anticipated life of the quarry:

- Updated Mineable Reserves:29,53,169m^3
- Anticipatedlifeofthequarry:295.3 ~ 296years

Table 1-3 Proposed year wise development and production plan

Year	Run of Mines in		Saleable Colour Granite Recovery @25%		Saleable Colour Granite Waste Recovery @75%	
	M3	Tonnes	M3	Tonnes	M3	Tonnes
First Year	6001	15903	1500	3975	4501	11928
Second Year	7202	19085	1800	4770	5402	14315
Third Year	8800	23320	2200	5830	6600	17490
Fourth Year	9601	25443	2400	6360	7201	19083
Fifth Year	10000	26500	**2500**	6625	7500	19875
Total	**41604**	**110251**	**10400**	**27560**	**31204**	**82691**

Table 1-4 Ultimate dimension of the Quarry at the top and bottom level

S. No	Ultimate Pit Dimension at Top (m)		Ultimate Pit Dimension at Bottom (m)		Depth	Pit SF. No
	Length	Width	Length	Width		
1	581.50	172	557.50	147	30	486(Part)
2	149	229	125	205	30	736/4

1.6.3 Location of the project

The color granite quarry is over an extent of 27.04.5 Ha at S. F. No. 486 (Part) & 736/4located at Jakkery Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu State, lies inthe latitude of 12°33'54.13" N (SF. No. 486) & 12°33'39.44" N (SF. No. 736/4) and longitude of77°52'14.17" E (SF. No. 486) & 77°52'15.40" E (SF. No. 736/4). The area is falls in topo sheetNo.57-H/14, H/15. Site Elevation ≃868m S.F. No (486(P)) AMSL and ≃786m (S. F. No 736/4) AMSL. The boundary co-ordinates of the mine lease area are tabulated in **Table 1-5.**

Table 1-5 Boundary Coordinates of the project

Corners	Co-ordinates	
	Longitude	Latitude
1	12° 33' 43.16"N	77° 52' 12.98"E
2	12° 33' 43.03"N	77° 52' 11.13"E
3	12° 33' 43.30"N	77° 52' 08.47"E
4	12° 33' 46.83"N	77° 52' 05.96"E
5	12° 33' 49.41"N	77° 52' 06.02"E
6	12° 33' 50.32"N	77° 52' 04.45"E
7	12° 33' 55.02"N	77° 52' 04.93"E
8	12° 34' 00.46"N	77° 52' 07.27"E
9	12° 34' 01.93"N	77° 52' 08.21"E
10	12° 34' 01.07"N	77° 52' 13.14"E
11	12° 34' 03.87"N	77° 52' 14.38"E
12	12° 34' 03.40"N	77° 52' 16.17"E
13	12° 34' 03.64"N	77° 52' 17.14"E
14	12° 34' 03.12"N	77° 52' 19.49"E
15	12° 33' 49.36"N	77° 52' 19.33"E
16	12° 33' 46.04"N	77° 52' 16.59"E
17	12° 33' 45.02"N	77° 52' 16.54"E
18	12° 33' 41.59"N	77° 52' 10.06"E
19	12° 33' 41.72"N	77° 52' 16.62"E
20	12° 33' 40.04"N	77° 52' 20.57"E
21	12° 33' 38.76"N	77° 52' 20.67"E
22	12° 338' 37.9"N	77° 52' 19.88"E
23	12° 33' 35.03"N	77° 52' 17.70"E
24	12° 33' 37.74"N	77° 52' 10.56"E
25	12° 33' 39.28"N	77° 52'09.90 "E

1.6.4 Connectivity of the Project

The Nearest Railway stations are PeriyaNagathunaiRailway Station~4.08Km, E. The project site is adjacent to SH - 85 i.e. Attibelle - Royakottai Road which is approximately 2.19 km (NNE). The NH-44Srinagar (Jammu & Kashmir) - Kanyakumari (Tamilnadu) ~ 14.45Km (NNE). The nearest airport is Kempegowda Int. Airport is about ~69.75Km, N and Hosur Airport at~14.31Km, NW.

1.6.5 Need for the project and its importance to the country and or region

The colour granite dimensional stone material by virtue of its pleasing colour and texture and its best ability to take polishing and appealing look in polished product has attracted the consumers in the building construction and interior decoration industries. The domestic market capabilities have also been explored in recent periods. Bulk quantity of the blocks is produced and exported as raw block sand some quantity is being processed at TAMIN's Granite processing units and exported as value added finished products.

The earning source in the targeted area is limited, most of the people in and around the area depend upon the seasonal agriculture and much of the people migrate to nearby towns where good industries and factories are growing up.

Through this project will give employment opportunities to 30 employees. This material is well known in the international supermarket of Granite which will fetch a good fetch a good foreign exchange to the nation.

1.6.5.1 Demand –Supply Gap

As of now there is good demand for this granite blocks in foreign as well as local market. The quarried granite blocks are either exported as raw blocks or processed at TAMIN's factories as value added products such as slabs, tiles, fancy items, monuments, sawn slabs or local sales as raw block etc.

1.6.5.2 Imports Vs Indigenous

There is no import of this granite material at present in India as we are having huge resources of this granite material particularly in South India.

1.6.5.3 Export possibility.

The quarried granite blocks are either exported as raw blocks or processed at TAMIN's factories as value added products such as slabs, tiles, fancy items, monuments, sawn slaps etc. Apart from TAMIN so many private enterprises are exporting the granite material as raw blocks, polished slab and monuments etc.

1.6.5.4 Domestic/export markets

As of now there is good demand for this granite blocks in foreign as well as local market. The quarries granite blocks are either exported as raw blocks or processed at TAMIN's as factories as value added products such as slabs, tiles, fancy items, monuments, sawn slabs etc. Parts from TAMIN so many private enterprises are exporting the granite material as raw blocks, polished slab and monuments etc.

1.7 EIA Study

As a part of compliance to the regulatory requirement i.e., to obtain Environmental Clearance from SEIAA, TN, TAMIN has appointed Environmental Consultants accredited by National Accreditation Board for Education and Training (NABET)-Quality Council of India (QCI), New Delhi. The work of undertaking field studies and preparation of EIA/EMP report under B1category as obtained Terms of Reference from SEIAA-TN, was assigned to M/s. EHS360 Labs Pvt. Ltd., Chennai by the project proponent. M/s. EHS360 Labs Pvt. Ltd is accredited by NABET, vide possession of Certificate No. NABET/EIA/2225/IA/0098_Rev.01, valid up to 24.06.2025.

1.8 EIA Cost

EIA Studiesincluding Baseline undertaken by EHSL for an amount of INR Rs.1,34,400/-

1.9 Scope of the Study

The scope of the work mentioned includes an assessment study of the proposed quarry project and their impact on the region. This study puts forward the most effective ways to protect the environment from increasing pollution caused by the mining activities and recommendations for environmental-friendly development initiatives in the region.

An Environmental Impact Assessment (EIA) is an assessment of the possible impact, whether positive or negativethat, themining activities may have on the environment, together consisting of the natural, social, and economic aspects, i.e., aiming at "Sustainable Development" due to the project activities.

This EIA report presents the existing baseline scenario and the assessment and evaluation of the environmental impacts that may arise during mining. This report also highlights the Environmental Monitoring Program during the operation phase of the project and the post mined management program. The generic structure of the EIA document will be as per the EIA Notification of the MoEF&CC dated 14thSeptember 2006 and subsequent amendments. The basic structure of the report will be as under:

Structure of Environmental Impact Assessment Report:

Chapter No	Description of Content
Chapter 1	**Introduction** Give the brief outline of the project as details of need of the EIA report, project proponent, nature and size of the project, location of the project, and need of project, scope of EIA study and applicable environmental regulations and standards
Chapter 2	**Project Description** The chapter gives details about the type and capacity of the project, need of the project, project location, layout & area break up, details of product, raw materials, manufacturing process and technology description, details of machineries and equipment, resource requirements, details on aspects of the project causing environmental impacts and mitigation measures incorporated to meet the standards.
Chapter 3	**Description of the Environment** The chapter describes the study area, study period, methodology and components selected for baseline studies, baseline status for ambient air, water, soil, socioeconomic, land use and meteorology of the study area within 10km radius.
Chapter 4	**Anticipated Environmental Impacts and Mitigation Measures** In this chapter, the anticipated environmental impacts due to proposed project activities are identified, analyzed, and assessed and thereafter the mitigation measures for the adverse impacts are proposed. The significance of impacts is determined. This chapter is prepared based on Chapter 2 & Chapter-3 by correlating the activities under proposed project and their impacts on receiving environmental attributes.
Chapter 5	**Analysis of Alternatives (Technology/site)** The chapter describes the alternative sites and the proposed factors for locating at the mentioned location. This would also describe the alternative technologies if any for manufacturing proposed products.
Chapter 6	**Environmental Monitoring Programme** The chapter proposes the post project monitoring plan and the budgetary provisions for the various environmental components.
Chapter 7	**Additional Studies** This chapter would highlight any additional studies required for the proposed project i.e Public Consultation. Risk Assessment, Disaster Management Plan, and R&R Studies and any additional recommended during the Scope stage/ToR.
Chapter 8	**Project Benefits** Highlights the direct and indirect benefits on the physical infrastructure and social infrastructure due to proposed projects.
Chapter 9	Environmental Cost Benefit Analysisisnotrecommended during scoping stage for this project
Chapter 10	**Environmental Management Plan** The chapter proposes the Environmental Management Plan highlighting the mitigation measures and roles and responsibilities of the management. This would include specific time frames for completion, resources required and specific

	responsibility.
Chapter 11	**Summary and Conclusion** Summarize the entire report and conclude the summary of the EIA report.
Chapter 12	**Disclosure of Consultants Engaged** Provides the brief profile of the EIA consultant organization and EIA project team for the current study.

1.9.1 Objectives of the Study

- To ensure environmental considerations are explicitly addressed and incorporated into the development decision-making process.
- To anticipate and avoid, minimize, or offset the adverse significant biophysical, social, and other relevant effects of the above project proposal.
- To protect the productivity and capacity of natural systems and the ecological processes which maintain their respective functions.
- To promote development that is sustainable and optimizes resource use as well as management opportunities.
- To fully recognize the scope and requirements of the TOR and comply with the same.
- The major objective of this study is to prepare a detailed Environmental Impact Assessment study within the study area i.e 10km radius from the project.

1.9.2 Methodology adopted for the Study.

An Environmental Impact Assessment (EIA) is an assessment of the possible impact, whether positive or negative, that a proposed project may have on the environment, together consisting of the natural, social, and economic aspects, i.e., aiming at “Sustainable Development” due to the project activities.

1.9.3 Applicable Regulatory Framework

The EIA process followed for this EIA report is composed of the following stages:

- Study of project information.
- Screening & Scoping.
- Environmental pre-feasibility study & application for approval of ToR.
- Collection of detailed project management plan/report.
- Baseline data collection.
- Impact identification, Prediction & Evaluation.
- Mitigation measures &marking out of EMP.
- Risk assessment and safety & disaster management plan.
- Review & finalization of EIA Report based on the ToR requirements.

- Submission of EIA report for implementation of mitigation measures & EMP as well as necessary clearances from relevant Authority.

1.9.4 Legal Completability

The establishmentand functioning of the mining industry will be governed by following Environmental acts/regulations besides the local zoning and landuse laws of the States.

1. The Water (Prevention and Control of Pollution) Act, 1974 as amended.
2. The Water (Prevention and Control of Pollution) Cess Act, 1977, as amended.
3. The Air (Prevention and Control of Pollution) Act, 1981 as amended (Air Act).
4. The Noise Pollution and Regulation Act: 2000
5. The Environment (Protection) Act, 1986 (EPA)
6. The Wildlife (Protection) Act, 1972 as amended.
7. The Forest (Conservation) Act, 1980 as amended.
8. The Public Liability Insurance Act, 1991
9. The Mines and Minerals (Regulation and Development) Act, 1957 as amended.
10. Circulars issued by the Director-General Mines Safety (DGMS).
11. Contract Labor Regulation and Abolition Act 1970
12. The Motor Vehicles Act – 1989
13. PESO – Explosives and handling of Hazardous Material: 1934.

1.9.5 Terms of Reference Compliance

The Terms of Reference (ToR) issued by SEIAA-TN compliance is given as follows:

S. No	Terms of Reference	Compliance
1. Seac Conditions - Site Specific		
1.1	1. Since Cauvery North is located at a distance of 2.8km, the PP shall propose conservationmeasures in consultation with DFO and include the same in the Environmental ManagementPlan.	The PP will propose conservation measures in consultation with DFO and include the same in the Environmental Management Plan during the submission of Final EIA Report.
	2. The PP shall furnish the study report of implications of mining on Flora and Fauna.	The study report of implications of mining on Flora and Fauna details are provided in the **Chapter 3.**
	3. The PP shall furnish the study report of wind flow pattern and their characteristics.	Wind flow pattern and theircharacteristics are provided in the **Chapter 4, Figure 4-1.**
	4. The PP shall furnish the study report of water flow direction and discharge of water resources.	The study report of water flow direction and discharge of water resources are provided in the **Chapter 3, Section 3.7.**
	5. The PP shall furnish the green belt development photographs along with Geo Coordinates.	The green belt development photographs along with Geo Coordinates are provided in the **Chapter 4, Section 4.8.**
	6. The PP shall furnish the detail study of siltation of mining deposits on check dams	The PP will furnish the detail study of siltation of mining deposits on check dams and riverbeds during the

	and riverbeds.	submission of Final EIA Report.
2. Seac Standard Conditions		
2.1	1. In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall besubmitted and it shall include the following: (i) Original pit dimension (ii) Quantity achieved Vs EC Approved Quantity (iii) Balance Quantity as per Mineable Reserve calculated. (iv) Mined out Depth as on date Vs EC Permitted depth (v) Details of illegal/illicit mining (vi) Violation in the quarry during the past working. (vii) Quantity of material mined out outside the mine lease area (viii) Condition of Safety zone/benches (ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimatedepth of not exceeding 50m.	AD mines letter is enclosed as **Annexure 8.**
	2. Details of habitations around the proposed mining area and latest VAO certificate regarding thelocation of habitations within 300m radius from the periphery of the site.	VAO Certificate regarding thelocation of habitations within 300m radius from the periphery of the site is enclosed as **Annexure 14.**
	3. The proponent is requested to carry out a survey and enumerate on the structures located withinthe radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated withdetails such as dwelling houses with number of occupants, whether it belongs to the owner (or) not,places of worship, industries, factories, sheds, etc with indicating the owner of the building, natureof construction, age of the building, number of residents, their profession and income, etc.	The structures are located within 50m, 100m, 150m, 200m, 250m, 300m and 500m from the boundary of the mine lease area is provided in **Chapter 2,** **Table 2-3.** Structures' Photographs are provided in**Figure 2-10**. There are no sensitive structures are located within the 500m radius from the project site.
	4. The PP shall submit a detailed hydrological report indicating the impact of proposed quarryingoperations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposedquarry.	The PP will submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry is provided during the Final EIA Report Submission.
	5. The Proponent shall carry out Bio diversity study through reputed Institution and the same shallbe included in EIA Report.	Biodiversity details are provided in the **Chapter 3, Section 3.9.**
	6. The DFO letter stating that the proximity distance of Reserve Forests, Protected	DFO letter is enclosed as **Annexure 9.**

	Areas,Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site.	
	7. In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or)partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructedand existing quarry wall, by involving any one of the reputed Research and Academic Institutions -CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division ofGeotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna UniversityChennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stabilitystatus of the quarry wall and possible mitigation measures during the time of appraisal for obtainingthe EC.	Not Applicable. Since the benches have been formed in accordance with the Regulation 106 of MMR, 1961.
	8. However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'SlopeStability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depthof the working is extended beyond 30 m below ground level.	Not applicable. It is an existing pit with a depth of 7 to 17m.
	9. The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry iscarried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate,mine foreman, II/I Class mines manager appointed by the proponent.	The PP will furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 during the Final EIA submission.
	10. The PP shall present a conceptual design for carrying out only controlled blasting operationinvolving line drilling and muffle blasting in the proposed quarry such that the blast-induced groundvibrations are controlled as well as no fly rock travel beyond 30 m from the blast site.	Sectional Plates are enclosed as **Annexure 7.**
	11. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by theproponent in the past, either in the same location or elsewhere in the State with video andphotographic evidences.	The EIA Coordinators will obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidence during the Final EIA submission.

	12. If the proponent has already carried out the mining activity in the proposed mining lease areaafter 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines. 13. What was the period of the operation and stoppage of the earlier mines with last work permitissued by the AD/DD mines? 14. Quantity of minerals mined out. · Highest production achieved in any one year · Detail of approved depth of mining. · Actual depth of the mining achieved earlier. · Name of the person already mined in that leases area. · If EC and CTO already obtained, the copy of the same shall be submitted. · Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches.	AD Mines Letter is enclosed as **Annexure 8.**
	15. All corner coordinates of the mine lease area, superimposed on a High-ResolutionImagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use andother ecological features of the study area (core and buffer zone).	All corner coordinates of the mine lease area are provided in **Chapter 1,Table 1-5.** Topo map is provided in **Chapter 3, Figure 3-2.**The land use and other ecological features of the study area (core and buffer zone) are provided in **Figure 3-6.**
	16. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc.,	The PP will be provided the Drone Video survey covering the cluster, Greenbelt and fencing during the Final EIA submission.
	17. The proponent shall furnish photographs of adequate fencing, green belt along the peripheryincluding replantation of existing trees & safety distance between the adjacent quarries &waterbodies nearby provided as per the approved mining plan.	The PP will furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan during the Final EIA Submission.
	18. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipatedimpacts of the mining operations on the surrounding environment, and the remedial measures	The details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications is provided in **Chapter 2, Section 2.7.** The anticipated impacts of the mining operations on the surrounding environment and the remedial measures are provided in **Chapter 4.**

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<tr><td></td><td>19. The Project Proponent shall provide the Organization chart indicating the appointment ofvarious statutory officials and other competent persons to be appointed as per the provisions of theMines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically andsystematically in order to ensure safety and to protect the environment.</td><td>The proposed Organization chart indicating the appointment of various statutory officials and other competent persons are provided in Chapter 10, Figure 10-1.</td></tr>
<tr><td></td><td>20. The Project Proponent shall conduct the hydro-geological study considering the contour map ofthe water table detailing the number of groundwater pumping & open wells, and surface water
bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected waterlevel data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess theimpacts on the wells due to mining activity. Based on actual monitored data, it may clearly beshown whether working will intersect groundwater. Necessary data and documentation in thisregard may be provided.</td><td>The PP will be conducted the hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD so as to assess the impacts on the wells due to mining activity and is provided during the Final EIA Submission.</td></tr>
<tr><td></td><td>21. The proponent shall furnish the baseline data for the environmental and ecological parameterswith regard to surface water/ground water quality, air quality, soil quality & flora/fauna includingtraffic/vehicular movement study.</td><td>
<table>
<tr><th>S. No</th><th>Description of Section</th><th>Section</th><th>Parameters</th></tr>
<tr><td>1</td><td>Meteorology</td><td>Section 3.5.2</td><td>Temperature, Relative Humidity, Rainfall, Wind Speed & Direction</td></tr>
<tr><td>2</td><td>Ambient Air Quality</td><td>Section 3.5.4</td><td>As per NAAQS, 2009 as per ToR</td></tr>
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<tr><td>7</td><td>Social Economic Status</td><td>Section 3.10</td><td>Socio Economic Profile of Study area (Population Profile, Employment and Livelihood, Education and Literacy, etc.,)</td></tr>
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<tr><td></td><td>22. The Proponent shall carry out the Cumulative impact study due to mining operations carried outin the quarry specifically with reference to the specific</td><td>The Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate</td></tr>
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	environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarryand the surrounding habitations in the mind.	change and flood control & health impacts are provided in **Chapter4.**The Environment Management plan is preparedand provided in the **Chapter 10**.
	23. Rainwater harvesting management with recharging details along with water balance (bothmonsoon & non-monsoon) be submitted.	The total water requirement is 3.5KLD and details are provided in **Chapter 4, Section 4.3.1** and **Table 4-5.** Rainwater will be stored in a pond in the lease area and will be used for mining activities including greenbelt. Rainwater harvesting management details are provided in **Chapter 4, Section 4.3.2.3.**
	24. Land use of the study area delineating forest area, agricultural land, grazing land, wildlifesanctuary, national park, migratory routes of fauna, water bodies, human settlements and otherecological features should be indicated. Land use plan of the mine lease area should be prepared toencompass preoperational, operational and post operational phases and submitted. Impact, if any, ofchange of land use should be given.	Complied. The Information/data presented in **Chapter 3, Figure 3-5.** Topo map is provided in **Chapter 3, Figure 3-2.** The land use and other ecological features of the study area (core and buffer zone) is provided in **Figure 3-6.**
	25. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should beprovided.	During extraction of blocks, each bench will be 6m height with vertical slope for dimensional cutting. The quantum of excavation is estimated to be 10,400 m^3 of ROM @25% recovery up to an average workable depth of 30 m. The generation of total waste is estimated to be about 45,086 m^3 (Granite Rejects 31,204 m^3 and over burden 13,882 m^3). Total waste to be generated during the five years of Mining Plan period will be 31,204 m^3. The waste material will be dumped on western side of SF. No. 486(Part) of the lease applied boundary. The dumps will be maintained not exceeding 5m height and the angle of slope of dumps will be at 45° from horizontal. The Land breakup is provided in **Chapter 2.**
	26. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the courtrestrictions for mining operations, should also be indicated and where so required, clearancecertifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology andMining should be secured and furnished to the effect that the proposed mining activities could beconsidered.	Not Applicable.
	27. Description of water conservation measures proposed to be adopted in the Project should begiven. Details of rainwater harvesting proposed in the Project, if any,	Water conservation measures proposed to be adopted in the Project as Rainwater storage ponds/tanks & Storage cum recharge ponds in possible areas.

	should be provided.	
	28. Impact on local transport infrastructure due to the Project should be indicated.	The road is located adjacent to the project site. The road will be damaged due to Heavy vehicle movement with materials; However, the PP will be maintained the roads with proper dust suppression measures and regular repairs.
	29. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) bothwithin the mining lease applied area & 300m buffer zone and its management during miningactivity.	Few trees are available in the lease area and 300m buffer zone. Most small bushes and shrubs are available. List of Trees located within the 300 m from the boundary of the mine lease area are provided in **Chapter 2, Table 2-4.** Photographs of Trees located within the 300 m from the boundary of the mine lease area are provided in **Figure 2-11**.
	30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP reportwhich should be site-specific.	Noted. The details of Mine Closure Plan are provided in **Chapter 7, Section 7.1.4** of the EIA report.
	31. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIAcoordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible.	Noted.
	32. The purpose of Green belt around the project is to capture the fugitive emissions, carbonsequestration and to attenuate the noise generated, in addition to improving the aesthetics. A widerange of indigenous plant species should be planted as given in the appendix-I in consultation withthe DFO, State Agriculture University. The plant species with dense/moderate canopy of nativeorigin should be chosen. Species of small/medium/tall trees alternating with shrubs should beplanted in a mixed manner.	Proposed Greenbelt details are provided in **Chapter 2 Section 2.16.8, Table 2-22**. It is proposed to plant 1200 trees.
	33. Taller/one year old Saplings raised in appropriate size of bags, preferably ecofriendly bagsshould be planted as per the advice of local forest authorities/botanist/Horticulturist with regard tosite specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all alongthe boundary of the project site with at least 3 meters wide and in between blocks in an organizedmanner.	Noted, Greenbelt / Plantation will be carried out to enhance the vegetative growth and aesthetic in the safety zone area. The 7.5m safety distance along the lease boundary has been identified to be utilized for afforestation. About 1200 trees will be planted in and around the lease area. Proposed Trees are Vagai, Panai, Eachai, etc., details are proposed in **Chapter 2, Section 2.16.8.**
	34. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for thecomplete life of the proposed	A Disaster management Plan is provided in **Chapter 7, Section 7.1.3.**

	quarry (or) till the end of the lease period.	
	35. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMPReport for the complete life of the proposed quarry (or) till the end of the lease period.	Risk Identification and Management details are provided in the **Chapter 7, Section 7.1.2.**
	36. Occupational Health impacts of the Project should be anticipated and the proposed preventivemeasures spelt out in detail. Details of pre-placement medical examination and periodical medicalexamination schedules should be incorporated in the EMP. The project specific occupational healthmitigation measures with required facilities proposed in the mining area may be detailed.	Complied. The details are provided in **Chapter 6, Section 6.3.1 and Table 6-1.**
	37. Public health implications of the Project and related activities for the population in the impactzone should be systematically evaluated and the proposed remedial measures should be detailedalong with budgetary allocations.	The Impacts on public health including employes due to project related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures is provided in **Chapter 4, Section 4.10.**
	38. The Socio-economic studies should be carried out within a 5 km buffer zone from the miningactivity. Measures of socio-economic significance and influence to the local community proposed tobe provided by the Project Proponent should be indicated. As far as possible, quantitativedimensions may be given with time frames for implementation.	The Socio-economic studies are provided in **Chapter 3, Section 3.9.** The socio-economic significance and influence/impact and mitigation measures details are provided in **Chapter 4, Section 4.9.**
	39. Details of litigation pending against the project, if any, with direction /order passed by any court of Law against the Project should be given.	No. There is no litigation pending against the project.
	40. Benefits of the Project if the Project is implemented should be spelt out. The benefits of theProject shall clearly indicate environmental, social, economic, employment potential, etc.	Benefits of the Project is provided in in EIA report **Chapter 8.**
	41. If any quarrying operations were carried out in the proposed quarrying site for which now theEC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given inthe previous EC with the site photographs which shall duly be certified by MoEF&CC, RegionalOffice, Chennai (or) the concerned DEE/TNPCB.	The project background details are provided in the **Chapter 1, Section 1.1.**
	42. The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavitstating to abide the EMP for the entire life of mine.	The PP will be provided the sworn affidavit stating to abide the EMP for the entire life of mine is provided during the Final EIA submission.

	43. Concealing any factual information or submission of false/fabricated data and failure to complywith any of the conditions mentioned above may result in withdrawal of this Terms of Conditionsbesides attracting penal provisions in the Environment (Protection) Act, 1986.	Noted.
3. SEIAA Specific Conditions		
	Annexure 'B'	
3.1	1. The PP shall furnish a Copy of valid mining lease approval obtained from the competentAuthority.	AD Mines letter is enclosed as **Annexure 8.**
	2. The PP shall furnish Copy of mining plan approved by the competent authority of the Dept ofGeology and Mining.	The copy of mining plan approved by the competent authority of the Dept ofGeology and Mining is enclosed as **Annexure 6.**
	3. The PP shall furnish EMP for the project life including progressive mine closure plan and finalmine closure plan with detailed budget plan.	The PP will furnish EMP for the project life including progressive mine closure plan and final mine closure plan with detailed budget plan during the Final EIA submission.
	4. The PP shall study in detail about the CO2 release and temperature rise and the project activitiesthat add to microclimate alternations and the same shall be included in the final EIA report.	The PP will study in detail about the CO2 release and temperature rise and the project activities that add to microclimate alternations and the same will be included in the final EIA report.
	5. The PP shall study in detail about impact of the proposed mining activity on the water bodies andnatural flow of surface and ground water and the same shall be included in the final EIA report.	Impact of the proposed mining activity on the water bodies andnatural flow of surface and ground water details are provided in **Chapter 3, Section 3.7.**
	6. The PP shall study in detail about Possibilities of water contamination and impact on aquaticecosystem health.	The PP will study in detail about Possibilities of water contamination and impact on aquatic ecosystem health and provided it in the final EIA submission.
	7. The PP shall study the impact on Invasive Alien Species (IAP).	Biodiversity details are provided in the **Chapter 3, Section 3.9.1.4.**
SEIAA Standard Conditions **Cluster Management Committee**		
3.2	1. Cluster Management Committee shall be framed which must include all the proponents in thecluster as members including the existing as well as proposed quarry.	The Cluster Management Committee will be formed which include all the proponents in the cluster as members including the existing as well as proposed quarry and do all the works as directed in the EC letter while commencement of quarry operation after obtaining EC.
	2. The members must coordinate among themselves for the effective implementation of EMP ascommitted including Green Belt Development, Water sprinkling, tree plantation, blasting etc.,	Noted.
	3. The List of members of the committee formed shall be submitted to AD/Mines before theexecution of mining lease and the same shall be updated every year to the AD/Mines.	Noted.

	4. Detailed Operational Plan must be submitted which must include the blasting frequency withrespect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarryin the form of route map and network.	Noted.
	5. The committee shall deliberate on risk & emergency management plan, fire safety & evacuationplan and sustainable development goals pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation ofthe cluster and evacuation plan.	Noted.
	6. The Cluster Management Committee shall form Environmental Policy to practice sustainablemining in a scientific and systematic manner in accordance with the law. The role played by thecommittee in implementing the environmental policy devised shall be given in detail in the EIAReport.	Noted & will be complied.
	7. The committee shall furnish action plan regarding the restoration strategy with respect to theindividual quarry falling under the cluster in a holistic manner.	Noted & will be complied.
	8. The committee shall deliberate on the health of the workers/staff involved in the mining as wellas the health of the public in the vicinity.	Noted & will be complied.
Agriculture &Agro-Biodiversity		
	9. Impact on surrounding agricultural fields around the proposed mining Area.	No. of trees detail are provided in **Chapter 2** and **Table 2-4**.
	10. Impact on soil flora & vegetation around the project site.	
	11.Details of type of vegetations including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetations all along the boundary of the proposed mining area shall committed mentioned in EMP.	
	12.The Environmental Impact Assessment should study the biodiversity, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem.	The Impact on surrounding agricultural fields, soil flora & vegetation, no. of trees & shrubs are provided in **Chapter 4.**
	13.Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services.	The entire mine lease area of 27.04.5 Ha is Government land which is leased by TAMIN. The quarry the precise area communication letter is enclosed as **Annexure–3.** The land is barren land and deposited with granite minerals. There is no requirement of restoration of ecosystem.

	14.The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture, and livestock.	TAMIN Proposed 7.5m safety distance for patta& private Lands and 10km for Govt poramboke lands and 50m distance will be maintained for roads.
Forests		
	15.The project proponent shall detail study on impact of mining on Reserve forests free ranging wildlife.	The entire mine lease area of 27.04.5 Ha is Government poramboke land which is leased by TAMIN. The quarry the precise area communication letter is enclosed as **Annexure–3.** There is no forest land is involved in the lease area.
	16.The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna.	Complied. The details of forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna are provided in **Chapter 3, Section 3.9.**
	17.The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection.	Complied. Standing trees and the existing trees are provided in **Chapter 2**, **Table 2-4** within 300m radius. TAMIN Mining activities will not disturb the any existing plant. However regular dust suppression will be maintained in and around the mining area and additional plants will be provided under afforestation program with native species.
	18.The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site.	Complied. The Environmental Impact Assessment covers Reserve Forests in nearby project sites. There is no National Parks, Corridors and Wildlife pathways, near project site.
Water Environment		
	19.Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period.	The number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) with depth of wells and water availabilityis provided in **Chapter 2, Table 2-5.** Hydro-geological study is carried out and submitted during the Final EIA Submission.
	20.Erosion Control measures.	Erosion Control measures are provided in **Chapter 4 Section 4.3.2.1** under surface water pollution control measures.
	21.Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Waterbodies/ Rivers, & any ecological fragile areas.	Complied. The details are provided in **Chapter 4, Section 4.3.**
	22.The project proponent shall study impact on fish habitats and the food WEB/ food	There is no major fish habitats and the food chain in the water body and Reservoir in nearby project site.

	chain in the water body and Reservoir.	
	23.The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities.	Complied. The study details are provided in **Chapter 4, Section 4.2.**
	24.The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible landform changes visual and aesthetic impacts.	There is no aquatic plants and animals in water bodies and landscape and there are no damages to nearby caves, heritage site, and archaeological sites possible landform changes visual and aesthetic impacts since there are no nearby caves, heritage sites, and archaeological sites within the core area other than Panchapalli Dam~9.24 km (SSE)which may have aquatic plants. There is no impact by the project activities.
	25.The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components, and microbial components.	Complied. The soil physical, chemical components of soil health details are provided in **Chapter 3, Section 3.9.**
	26.The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites.	There are no major wetlands, water bodies, rivers streams, lakes in nearby project site.
	27. The EIA shall include the impact of mining activity on the following: a) Hydrothermal/Geothermal effect due to destruction in the Environment. b) Bio-geochemical processes and its foot prints including environmental stress. c) Sediment geochemistry in the surface streams.	Noted & Will be complied.
Energy		
	28. The measures taken to control Noise, Air, Water, Dust Control, and steps adopted to efficiently utilize the Energy shall be furnished.	None.
Climate Change		
	29.The Environmental Impact Assessment shall study in detail the carbon emission and suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities.	The emission like PM10, PM2.5, NOX and SO2 are major pollution contribution to the atmosphere by the mining activities. It was observed that the maximum ground level concentration observed due to mining activities and traffic movement without control measures for PM10, PM2.5 and NOx are 3.29 µg/m^3, 1.54 µg/m^3 and 2.51 µg/m^3 respectively. The highest concentration levels identified at the project site only. So, it can be concluded that even during operation of quarry the impact envisaged is moderate.
	The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution, and above soil & below soil carbon stock, soil health and physical, chemical &biological soil features.	The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution, and above soil & below soil carbon stock, soil health and physical, chemical & biological soil features will be provided during Final EIA Submission.
	31. Impact of mining on pollution leading to GHGs emissions and the impact of the same	Impact of mining on pollution leading to GHGs emissions and the impact of the same on the local

	on thelocal livelihood.	livelihood will be provided during Final EIA Submission.
Mine Closure Plan		
	32.Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued.	Complied. The details are provided in **Chapter 7, Section 7.1.4.**
EMP		
	33. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategiescovering the entire mine lease period as per precise area communication order issued and the scopefor achieving SDGs.	Environment Management Plan along with adaptation, mitigation & remedial strategiescovering the entire mine lease period as per precise area communication order issued and the scopefor achieving SDGs are provided in the **Chapter 10.**
	34.The Environmental Impact Assessment should hold detailed study on EMP with budget for green belt development and mine closure plan including disaster management plan.	Complied. EMP with budget for green belt development and mine closure plan including disaster management plan is provided in **Chapter 10.**
Risk Assessment		
	35.To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining.	Complied. The Environment Management Plan along with adaptation, mitigation & remedial strategies are provided in **Chapter 7, Section 7.1.2.**
Disaster Management Plan		
	36.To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued.	Complied. A disaster management plan and disaster mitigation measure areprovided in **Chapter 7, Section 7.1.3.**
Others		
	37.The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc.	VAO Letter is enclosed as **Annexure 14.**
	38.As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan.	The concerns raised during the public consultation and all the activities proposed will be included in the Environment Management Plan after public Hearing.
	39.The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The	During quarry operations, Municipal solid waste and waste oil are likely to be generated which can be broadly categorized as Hazardous Waste and Non-

	ecological risks and impacts of plastic &microplastics on aquatic environment and freshwater systems due to activities, contemplated during mining may be investigated and reported.	hazardous Waste. Further, the generated solid waste generation may include Biodegradable, Recyclable and Inert compounds. Organic waste from domestic activities will be disposed through Municipal bin including food waste and Inorganic waste will be disposed through TNPCB authorized recyclers. Strict guidelines will be put in place to manage solid waste generation during the operational phase of the development.
Standard Terms of Reference for (Mining of minerals)		
1.1	An EIA-EMP Report shall be prepared for peak capacity (…..MTPA)operation in an ML/projectarea of.....ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.	Noted & Will be complied.
1.2	An EIA-EMP Report would be prepared for peak capacity operation to cover the impacts andenvironment management plan for the project specific activities on the environment of the region and the environmental quality encompassing air, water, land, biotic community, etc. throughcollection of data and information, generation of data on impacts including prediction modeling for..... MTPA of mineral production based on approved project/Mining Plan for.....MTPA. Baselinedata collection can be for any season (three months) except monsoon.	Noted & Will be complied.
1.3	Proper KML file with pin drop and coordinate of mine at 500-1000 m interval be provided.	Complied. Proper KML file with pin drop and coordinate of mine at 500-1000 m interval will be provided.
1.4	A Study area map of the core zone (project area) and 10 km area of the buffer zone (1: 50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage patternincluding rivers/streams/nullahs/canals, locations of human habitations, major constructionsincluding railways, roads, pipelines, major industries, mines and other polluting sources. In case ofecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ ElephantReserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangeredfauna and plants of medicinal and economic importance found in the 15 km study area should begiven. The above details to be furnished in tabular form also	A Study area map of the core zone (project area) and 10 km area of the buffer zone (1: 50,000 scale)clearly delineating the major topographical features such as the land use, surface drainage patternincluding rivers/streams/nullahs/canals, locations of human habitations, major constructionsincluding railways, roads, pipelines, major industries, mines and other polluting sources and ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ ElephantReserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangeredfauna and plants of medicinal and economic importance found in the 15 km study area are provided in the **Chapter 2, Section 3.2.** Salient Features within 15km radius of the lease area are provided in the **Table 2-2.**

1.5	Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivableland as defined in the revenue records, forest areas (as per records), along with other physicalfeatures such as water bodies, etc should be furnished.	Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivableland as defined in the revenue records, forest areas (as per records), along with other physicalfeatures such as water bodies, etc are provided in the **Chapter 3, Section 3.4.5, Figure 3-6**.
1.6	A contour map showing the area drainage of the core zone and 25 km of the study area (where thewater courses of the core zone ultimately join the major rivers/streams outside the lease/projectarea) should also be clearly indicated in the separate map.	The Contour map of the study area is provided in the **Figure 3-7.**
1.7	Catchment area with its drainage map of 25 km area within and outside the mine shall be providedwith names, details of rivers/ riverlet system and its respective order. The map should clearlyindicate drainage pattern of the catchment area with basin of major rivers. Diversion of drains/ riverneed eloboration in form of lengthe, quantity and quality of water to be diverted.	The Drainage map of the study area is provided in the **Figure 3-10.**
1.8	(Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine lifeshould be provided on the basis of the approved rated capacity and calendar plans of productionfrom the approved Mining Plan. Geological maps and sections should be included. The Progressivemine development and Conceptual Final Mine Closure Plan should also be shown in figures. Detailsof mine plan and mine closure plan approval of Competent Authority should be furnished for greenfield and expansion projects.	Details of mineral reserves, geological status of the study area and the seams to be worked,ultimate working depth and progressive stage-wise working scheme until the end of mine life will be provided in the **Chapter 1, Section 1.6.2, Table 1-2, Table 1-3, Table** 1-4**.**
1.9	Details of mining methods, technology, equipment to be used, etc., rationale for selection ofspecified technology and equipment proposed to be used vis-à-vis the potential impacts should beprovided.	The details of Mining method and technology are provided in the **Chapter 2, Section 2.9.** List of machineries are provided in the**Table 2-18.**
1.10	Impact of mining on hydrology, modification of natural drainage, diversion and channeling of theexisting rivers/water courses flowing though the ML and adjoining the lease/project and the impacton the existing users and impacts of mining operations thereon.	Impact of mining on hydrology, modification of natural drainage, diversion and channeling of the existing rivers/water courses flowing though the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon are provided during the Final EIA report submission.
1.11	A detailed Site plan of the mine showing the proposed break-up of the land for mining operationssuch as the quarry area, OB dumps, green belt, safety zone, buildings,	Land requirement and land use pattern of the lease area are provided in the **Table 2-14 &Table 2-15.**

	infrastructure, Stockyard,township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape featuressuch as existing roads, drains/natural water bodies to be left undisturbed along with any naturaldrainage adjoining the lease /project areas, and modification of thereof in terms of construction ofembankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads,major haul roads, etc should be indicated.	
1.12	Original land use (agricultural land/forestland/grazingland/wasteland/water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, inparticular, agricultural land/forestland/grazing land/water bodies falling within the lease/project andacquired for mining operations should be analyzed. Extent of area under surface rights and undermining rights should be specified. Area under Surface RightsArea under Surface Area Under Mining Rights(ha) S.N ML/Project Land use Rights(ha) (ha) Area under Both (ha) 1 Agricultural land 2 Forest Land 3 Grazing Land 4 Settlements 5 Others (specify) S.N. Details Area (ha) 1 Buildings 2 Infrastructure 3 Roads 4 Others (specify) Total	Land use and Land cover of the study area is provided in the **Table 3-3 & Figure 3-5** and **Figure 3-6.**
1.13	Study on the existing flora and fauna in the study area (10km) should be carried out by an institutionof relevant discipline. The list of flora and fauna duly authenticated separately for the core andstudy area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna,or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project fallswithin 15 km of an ecologically sensitive area, or used as a	Flora and Fauna details are provided in the **Chapter 3, Section 3.9.**

	migratory corridor then aComprehensive Conservation Plan along with the appropriate budgetary provision should beprepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of theState Govt. should also be obtained and furnished.	
1.14	One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface andgroundwater), soil - along with one-season met data coinciding with the same season for AAQcollection period should be provided. The detail of NABL/ MoEF&CC certification of therespective laborartory and NABET accreditation of the consultant to be provided.	The emission like PM10, PM2.5, NOX and SO2 are major pollution contribution to the atmosphere by the mining activities. It was observed that the maximum ground level concentration observed due to mining activities and traffic movement without control measures for PM10, PM2.5 and NOx are 3.29 µg/m^3, 1.54 µg/m^3 and 2.51 µg/m^3 respectively. The highest concentration levels identified at the project site only. So, it can be concluded that even during operation of quarry the impact envisaged is moderate.
1.15	Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location of varioussampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zonesshould be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in theupwind/upstream/non-impact/nonpolluting area as a control station. The monitoring should be asper CPCB guidelines and parameters for water testing for both ground water and surface water asper ISI standards and CPCB classification wherever applicable. Observed values should be providedalong with the specified standards.	Details of Surface water & Ground water sampling locations are provided in the **Table 3-12, Table 3-14&Figure 3-15, Figure 3-16.**
1.16	For proper baseline air quality assessment, Wind rose pattern in the area should be reviewed andaccordingly location of AAMSQ shall be planned by the collection of air quality data by adequatemonitoring stations in the downwind areas. Monitoring location for collecting baseline data shouldcover overall the 10 km buffer zone i.e. dispersed in 10 km buffer area. In case of expansion, thedisplayed data of CAAQMS and its comparison with the monitoring data to be provided	Wind rose of meteorology considered for modelling is provided in the **Figure 4-1.**

1.17	A detailed traffic study along with presence of habitation in 100 mts distance from both side ofroad, the impact on the air quality with its proper measures and plan of action with timeline forwidening of road. The project will increase the no. of vehicle along the road which will indirectlycontribute to carbon emission so what will be the compensatory action plan should be clearly spellout in EIA/ EMP report.	Traffic density details are provided in the **Chapter 4, Section 4.11.**
1.18	The socio-economic study to conducted with actual survey report and a comparative assessment tobe provided from the census data should be provided in EIA/ EMP report also occupational status &economic status of the study area and what economically project will contribute should be clearlymention. The study should also include the status of infrastructural facilities and amenities presentin the study area and a comparative assessment with census data to be provided and to link it withthe initialization and quantification of need based survey for CSR activities to be followed.	The Socio-economic studies are provided in **Chapter 3, Section 3.9.** The socio-economic significance and influence/impact and mitigation measures details are provided in **Chapter 4, Section 4.9.**
1.19	The Ecology and biodiversity study should also indicate the likely impact of change in forest areafor surface infrastructural development or mining activity in relation to the climate change of thatarea and what will be the compensatory measure to be adopted by PP to minimize the impact offorest diversion.	Ecology and biodiversity details are provided in the **Chapter 3, Section 3.9.**
1.20	Baseline data on the health of the population in the impact zone and measures for occupationalhealth and safety of the personnel and manpower for the mine should be submitted.	Baseline data on the health of the population in the impact zone and measures for occupationalhealth and safety of the personnel and manpower for the mine details are provided in the **Chapter 4, Section 4.10.**
1.21	Impact of proposed project/activity on hydrological regime of the area shall be assessed and reportbe submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted.	Impact of proposed project/activity on hydrological regime of the area shall be assessed and report be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and provided during the Final EIA report submission.
1.22	Impact of mining and water abstraction from the mine on the hydrogeology and groundwater regimewithin the core zone and 10 km buffer zone including long-term monitoring measures should beprovided. Details of rainwater harvesting and measures for recharge of groundwater should bereflected in case there is a declining trend of groundwater availability and/or if the area	Details of Surface water & Ground water sampling locations are provided in the **Table 3-12, Table 3-14&Figure 3-15, Figure 3-16.** Rainwater harvesting details are provided in the **Chapter 4, Section 4.3.2.3.**

	falls withindark/grey zone.	
1.23	Study on land subsidence including modeling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues should be carried out.	Study on land subsidence including modeling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues will be provided during final EIA report submission.
1.24	Detailed water balance should be provided. The break up of water requirement as per differentactivities in the mining operations, including use of water for sand stowing should be givenseparately. Source of water for use in mine, sanction of the Competent Authority in the State Govt.and impacts vis-à-vis the competing users should be provided.	The detailed water balance and breakup of the water requirement are provided in the **Chapter 4, Section 4.3, Figure 4-5.**
1.25	PP shall submit design details of all Air Pollution Control eEuipment (APCEs) to be implemented aspart of Environment Management Plan vis-à-vis reduction in concentration of emission for eachAPCEs	PP will submit design details of all Air Pollution Control Equipment (APCEs) to be implemented as part of Environment Management Plan vis-à-vis reduction in concentration of emission for each APCEs will be provided during final EIA report submission.
1.26	PP shall propose to use LNG/CNG based mining machineries and trucks for mining operation andtransportation of mineral. The measures adopted to conserve energy or use of renewable sourcesshall be explored.	Noted & Will be complied.
1.27	PP to evaluate the green house emission gases from the mine operation/ washery plant andcorresponding carbon absorption plan.	The green house emission gases from the mine operation/ washery plant and corresponding carbon absorption plan will be provided during final EIA report submission.
1.28	Site specific Impact assessment with its mitigation measures, Risk Assessment and DisasterPreparedness and Management Plan should be provided.	A disaster management plan and disaster mitigation measure are provided in **Chapter 7, Section 7.1.3.** Risk Identification and Management details are provided in the **Chapter 7, Section 7.1.2.**
1.29	Impact of choice of mining method, technology, selected use of machinery and impact on airquality, mineral transportation, handling & storage/stockyard, etc, Impact of blasting, noise andvibrations should be provided.	The details of Mining method and technology are provided in the **Chapter 2, Section 2.9.** List of machineries are provided in the**Table 2-18.**
1.30	Impacts of mineral transportation within the mining area and outside the lease/project along withflow-chart indicating the specific areas generating fugitive emissions should be provided. Impactsof transportation, handling, transfer of mineral and waste on air quality, generation of effluents fromworkshop etc, management plan for maintenance of HEMM and other machinery/equipment shouldbe given. Details of various facilities such as rest areas and canteen for workers andeffluents/pollution load emanating from these activities should also be provided.	The air environment details are provided in the **Chapter 4, Section 4.2.**
1.31	Details of various facilities to be provided to	The manpower details are provided in the **Chapter**

	the workers in terms of parking, rest areas and canteen and effluents/pollution load resulting from these activities should also be given.	**2,Table 2-19.**
1.32	The number and efficiency of mobile/static water jet, Fog cannon sprinkling system along the mainmineral transportation road inside the mine, approach roads to the mine/stockyard/siding, and alsothe frequency of their use in impacting air quality should be provided.	List of machineries are provided in the **Table 2-18.**
1.33	Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to thepre- mining status should be provided. A Plan for the ecological restoration of the mined out areaand post mining land use should be prepared with detailed cost provisions. Impact and managementof wastes and issues of re-handling (wherever applicable) and backfilling and progressive mineclosure and reclamation should be furnished.	The mine closure plan details are provided in **Chapter 7, Section 7.1.4.**
1.34	Adequate greenbelt nearby areas, mineral stock yard and transportation area of mineral shall beprovided with details of species selected and survival rate Greenbelt development should beundertaken particularly around the transport route.	Greenbelt / Plantation will be carried out to enhance the vegetative growth and aesthetic in the safety zone area. The 7.5m safety distance along the lease boundary has been identified to be utilized for afforestation. About 1200 trees will be planted in and around the lease area. Proposed Trees are Vagai, Panai, Eachai, etc., details are proposed in **Chapter 2, Section 2.16.8.**
1.35	Cost of EMP (capital and recurring) should be included in the project cost and for progressive andfinal mine closure plan.	Complied. EMP with budget for green belt development and mine closure plan including disaster management plan is provided in **Chapter 10.**
1.36	Details of R&R. Detailed project specific R&R Plan with data on the existing socio-economicstatus of the population (including tribals, SC/ST, BPL families) found in the study area and broadplan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities beingoffered, etc and costs along with the schedule of the implementation of the R&R Plan should be given.	Not applicable. The lease area is classified as Government Poramboke land. TAMIN has obtained the Precise area communication letter is obtained from Govt. of Tamil Nadu for 20 years. There is no Rehabilitation and Resettlement is involved. Precise area communication letter is enclosed as **Annexure-3.**
1.37	CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) forspecific activities over the life of the project should be given.	CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project will be provided during the final EIA report submission.
1.38	Corporate Environment Responsibility:	CER details are provided in the **Chapter 4, Section 4.9.2.**

1.39	a) The Company must have a well laid down Environment Policy approved by the Board ofDirectors.	Noted.
1.40	b) The Environment Policy must prescribe for standard operating process/procedures to bring intofocus any infringements/deviation/violation of the environmental or forest norms/conditions.	Noted.
1.41	c) The hierarchical system or Administrative Order of the company to deal with environmentalissues and for ensuring compliance with the environmental clearance conditions must be furnished.	Noted.
1.42	d) To have proper checks and balances, the company should have a well laid down system ofreporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.	Noted.
1.43	e) Environment Managament Cell and its responsibilities to be clearly spleel out in EIA/ EMPreport	The proposed Organization chart indicating the appointment of various statutory officials and other competent persons are provided in **Chapter 10, Figure 10-1.**
1.44	f) In built mechanism of self-monitoring of compliance of environmental regulations should be indicated.	Noted& Will be complied.
1.45	Status of any litigations/ court cases filed/pending on the project should be provided.	No. There is no litigation pending against this project.
1.46	PP shall submit clarification from DFO that mine does not falls under corridors of any NationalPark and Wildlife Sanctuary with certified map showing distance of nearest sanctuary.	DFO Letter is enclosed as **Annexure 9.**
1.47	Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closer planapproval. NOC from Flood and Irrigation Dept. (if req.), etc. wherever applicable.	HACA Letter & DGM NOCs are enclosed as **Annexure 10 & 11.**
1.48	Details on the Forest Clearance should be given as per the format given: Total ML TotalProject Area Forest(ha) land (ha) Dateof FC Extent ofForest Land Balance area for whichFC is yet to beobtainedStatus of applFordiversion of forestlandIf more than oneprovide details ofeach FC.	Not applicable.
1.49	In case of expansion of the proposal, the	Noted.

	status of the work done as per mining plan and approvedmine closure plan shall be detailed in EIA/ EMP report	
1.50	Details on Public Hearing should cover the information relating to notices issued in the newspaper,proceedings/minutes of Public Hearing, the points raised by the general public and commitmentsmade by the proponent and the time bound action proposed with budgets in suitable time frame.These details should be presented in a tabular form. If the Public Hearing is in the regionallanguage, an authenticated English Translation of the same should be provided.	
1.51	PP shall carry out survey through drone highlighting the ground reality for atleast 10 minutes.	PP will carry out survey through drone highlighting the ground reality for atleast 10 minutes will be provided during the final EIA report submission.
1.52	Detailed Chronology of the project starting from the first lease deed alloted/Block allotment/ Landacquired to its No. of renewals, CTO /CTE with details of no. renewals, previous EC(s) granted details and its compliance details, NOC details from various Govt bodies like Forest NOC(s),CGWA permissions, Power permissions, etc as per the requisites respectively to be furnished intabular form.	Detailed Chronology of the project starting from the first lease deed are provided in the **Chapter 1** project background.
1.53	The first page of the EIA/ EMP report must mention the peak capacity production, area, detail ofPP, Consultant (NABET acrreditation) and Laboratory (NABL / MoEF & CC certification)	Noted & Will be complied.
1.54	The compliances of ToR must be properly cited with respective chapter section and page no intabular form and also mention sequence of the respective ToR complied within the EIA-EMP reportin all the chapter's section.	Noted & Will be complied.
Additional TOR specified by the SEAC to deal with the violation aspects of the mining projects **SECTION A** **As per the MoEF & CC Notification S.O. 1030 (E) dated: 08.03.2018,**		
1.	"The cases of violations will be appraised by the Expert Appraisal Committee at the Central level or State or Union territory level Expert Appraisal Committee constitutedunder sub-section (3) of section 3 of the Environment (Protection) Act, 1986 with aview to assess that the project has been constructed at a site which under prevailinglaws is permissible and expansion has been done which can run sustainably undercompliance of environmental norms	Noted.

	with adequate environmental safeguards, and incase, where the findings of Expert Appraisal Committee for projects under category A or State or Union territory level Expert Appraisal Committee for projects undercategory B is negative, closure of the project will be recommended along with otheractions under the law.	
2.	In case, where the findings of the Expert Appraisal Committee or State or Union territory level Expert Appraisal Committee on point at sub-paragraph (4) above areaffirmative, the projects will be granted the appropriate Terms of Reference forundertaking Environment Impact Assessment and preparation of EnvironmentManagement Plan and the Expert Appraisal Committee or State or Union territory levelExpert Appraisal Committee, will prescribe specific Terms of Reference for the projecton assessment of ecological damage, remediation plan and natural and communityresource augmentation plan and it shall be prepared as an independent chapter in theenvironment impact assessment report by the accredited consultants, and the collectionand analysis of data for assessment of ecological damage, preparation of remediationplan and natural and community resource augmentation plan shall be done by anenvironmental laboratory duly notified under the Environment (Protection) Act, 1986,or a environmental laboratory accredited by the National Accreditation Board forTesting and Calibration Laboratories, or a laboratory of the Council of Scientific and Industrial Research institution working in the field of environment."	Noted.
SECTION B		
1	**Natural resource Augmentation:** a) The resources that should be considered for augmentation should essentiallyconsist of land, biota, air, water and other resources as applicable. b) Proponent may choose one or more of the resource augmentation as applicableand provide a description of the augmentation proposal in detail for eachresource. c) The proponent should also furnish the cost	Noted.

	for each augmentation scheme.	
2	**Community resource Augmentation:** a) The proponent should prepare a plan of action for addressing the needs of thecommunity in terms of resources in the sectors of education, health and sportsprimarily and other such resources as applicable to the community in thevicinity of the project. b) The community resource augmentation plan should consist of rehabilitation ofhouses and people, budget allocation and time schedule for completing theactivity.	Noted.
SECTION C		
	The proponent should prepare content for the ecological damage assessment, remediation plan, natural resource augmentation and community resource augmentationseparately in a chapter and include in the EIA / EMP report.	The ecological damage assessment, remediation plan, natural resource augmentation and community resource augmentationseparately in a chapter and it will be provided during the final EIA report submission.
SECTION D		
	a) After the appraisal of the EIA / EMP report submitted by the proponent, theSEAC will make a judgement of the quality of the content in the EIA / EMPreport specifically with reference to the chapter covering the ecological damageassessment, remediation plan, natural resource augmentation and community resource augmentation.	Accepted &Noted.
	b) In the judgement of SEAC, if the quality of the content in the chapter is notsatisfactory, the SEAC may direct the proponent to further revise the chapterand resubmit the EIA/EMP report.	Noted.
	c) If SEAC concludes that the technical part is satisfactory and the costing aspectis not satisfactory then the SEAC may revert to legal provisions, MoEF & CCguidelines and similar expert committee recommendations for finalizing thecost aspects or the SEAC may use its own expertise and experience in finalizingthe cost.	Noted.
SECTION E		
	The proponent is directed to furnish data as per the questionnaire appended in AnnexureI. It will help the SEAC in arriving the ecological damage and the associated cost.	Noted.
SECTION F		
	In compliance with the Supreme Court order stated in MoEF & CC letter F.No. 3-	Noted. List of reserve forests are provided in the **Table 2-2.**

	50/2017 IA.III-pt dated: 05th January 2018, the proponent is required to submit the NoObjection Certificate obtained from the Department of Geology and Mining, Government ofTamil Nadu regarding payment of 100% cost of illegally mined mineral under section 21(5) of MMDR Act 1957 which would account for mining operations in violation of the following: a) Without Environmental Clearance (EC), or in excess of the quantity approvedin EC b) Without Consent to Operate (CTO) or in excess of the quantity approved inCTO and c) Without mining plan/scheme of mining or in excess of the quantity approved inmining plan / scheme of mining d) Without Forest Clearance e) Any other violation List out the details of reserve forest and wildlife sanctuary nearby the projectsite (the details should also include other districts which are nearby the project site) andalso furnish the detail of distance between the project site and reserve forests/wildlifesanctuary. Whether the project site attracts the HACA clearance? If so, also furnish theHACA clearance for the mining from the competent authority. The proponent is instructed to fill in the form contained in Annexure 1 to work out thedetails of the ecological damage during the violation period.	HACA Letter is enclosed as **Annexure 11.**
A. STANDARD TERMS OF REFERENCE		
1.	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.	Yearwise production details are provided in the **Table 1-3.**
2.	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.	The proposed colour granite quarry is located at S.F.No.486 (Part) & 736/4, Jakkery Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu State. The lease area for mining of color granite is 27.04.5 Ha. The quarry land is classified as Government Poramboke land. TAMIN has obtained a Precise area communication letter for a period of 20 years vide Govt.

		Letter. No.5883890/MME.2/2023-1, dated: 14.02.2024. Precise area communication letter is attached as **Annexure-3.**
3.	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology in the name of TAMIN only.
4.	All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/topo sheet, topographic sheet, geomorphology, and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	All corners co-ordinates of the mine lease area is given in **Chapter 1** and **Section 1.6.3, Table 1-5**, Topo map in **Figure 2-9.**Geology and Geomorphology of the area is provided in **Chapter 3, Section 3.4.6, 3.4.7**, **Figure 3-8&Figure 3-9.**
5.	Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of landforms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	Topo map with existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics are prepared in 1:50000 scale and is given as **Figure 3-2.** Geomorphology pattern of the study area is shown in **Chapter 3, Section 3.4.7**, **Figure 3-7&Figure 3-9**. Drainage map is shown as **Figure 3-10.**
6.	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	Government has issued a precise area communication letter for a period of 20 years vide Govt. Letter. No.5883890/MME.2/2023-1, dated: 14.02.2024. Precise area communication letter is attached as **Annexure-3.** Mining Plan was submitted and approved by Commissionerate of Geology and Mining; Chennai vide letter Rc. No. 8664/MM4/2019, dated: 22.05.2024 is enclosed as **Annexure-4.** The production details are provided in **Chapter 1 Section 1.6.2.**
7.	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.	Environmental Policy of TAMIN is given in **Chapter 10 Section 10.11.**

8.	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	It is a colour granite quarry and open cast. Mining methodology will be followed. The workable depth of mining will be 30m from the top of the hill. Mining methodology is provided in **Chapter 2** and **Section 2.9 andSection 2.10.** Safeguard measures are provided in **Chapter-4**, **Section 4.10.**
9.	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc, should be for the life of the mine/lease period.	10 Km radius from the project periphery area is considered as study area. The baseline study details arefurnished in **Chapter 3**.The production and waste generation from quarry activitiesis estimated at 1:9 ratio details are provided in **Chapter 2, Section 2.7**.
10.	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.	The environmental sensitive areas covering an aerial distance of 15km from the project boundary is given **Chapter 3, Section 3.2 and Table 3-1.** Land use of the study area is provided in **Figure 3-6** and **Table 3-3**with delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements, and other ecological features.
11.	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.	It is a governmentporamboke land lease obtained lease for 20 years by the TAMIN. No habitation in the lease area, no R&Rissues areinvolved in the proposed project. The generation of total waste is estimated to be about 45,086 m^3 (Granite Rejects 31,204 m^3 and over burden 13,882 m^3).
12.	A certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	Not applicable. No forest land is not involved in the lease area.
13.	Status of forestry clearance for the broken-up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	Not applicable. No forest land is not involved in the lease area.
14.	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers	Not applicable. No scheduled tribes and other traditional forest dwellers are observed in the study area since, the

	(Recognition of Forest Rights) Act, 2006 should be indicated.	proposed project land is a non-forest government poramboke land.
15.	The vegetation in the RF/PF areas in the study area, with necessary details, should be given.	The list of Reserve forests available within the 15km radius is provided in **Chapter 3** and **Section 3.3, Table 3-1and Figure 3-3**.
16.	A study shall be done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications, and submitted.	Baseline Biological survey was carried out to assess the ecology of the study area. The floral diversity is grouped into trees, shrubs, climbers, and herbs. Similarly, the faunal diversity is grouped into mammals, birds, reptiles, and amphibians. There are no extinct flora and fauna species found in the study area. The biodiversity details are provided in the **Chapter 3, Section 3.9.**
17.	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/ (existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.	No Biosphere Reserves, Wildlife Corridors, Tiger/ Elephant Reserves are available within 15Km of mine lease area. The detailed Environmental Sensitivity areas within the 15km radius of the project site are given in **Chapter 3, Section 3.3**and **Table 3-1&Figure 3-3.**
18.	A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	Detailed Biological Study of the Study Area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] was carried out and list of Flora & Fauna is detailed is given in **Chapter 3, Section 3.9.**
19.	Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining	Not applicable, Since the proposed project area is not falls under Critically Polluted or 'Aravali Range'.

	activities could be considered.	
20.	Similarly, for Coastal Projects, a CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HIL, CRZ area, location of the mine lease with respect to CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not applicable since proposed lease does not fall under CRZ area.
21.	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need-based sample survey, familywise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.	Not applicable. The lease area is classified as Government Poramboke land. TAMIN has obtained the Precise area communication letter is obtained from Govt. of Tamil Nadu for 20 years. There is no Rehabilitation and Resettlement is involved. Precise area communication letter is enclosed as **Annexure-3.**
22.	One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season); December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.	One season **(March 2024 – May 2024**) the primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna, Site- specific meteorological data collected and the detail are furnished in **Chapter 3.** 1. Meteorology **Section3.5.2** Temperature, Relative Humidity, Rainfall, Wind Speed & Direction 2. Ambient Air Quality **Section 3.5.4.** As per NAAQS, 2009 3. Ambient Noise Levels **Section3.6** Day equivalent noise levels, Night equivalent noise levels (As per CPCB Standards) 4. Water Quality Surface water – **Section 3.7.2** Ground water – **Section 3.7.3** Ground Water – IS 10500:2012 Surface Water -IS 2296(Class – A) 5. Soil Quality **Section 3.8** ICAR (Indian Council of Agricultural research) 6. Ecology **Section 3.9** Flora and Fauna

		7. Social Economic Status Section 3.10 (Socio Economic Profile of Study area (Population Profile, Employment and Livelihood, Education and Literacy, etc.,)
23.	Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used, and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	AERMOD Air quality modeling has been carried out to predict the air quality during the operation of proposed project activities impacts within the 10km radius of the project site for PM10, PM2.5 and Nox details area. The details are provided in **Chapter 4, Section 4.2.4.** The maximum ground level concentration observed due to mining activities and traffic movement through Air Modelling for PM10, PM2.5, and NOx are 3.29 µg/m^3, 1.54 µg/$m^3$and 2.51 µg/m^3 respectively. The details are given in **Chapter 4, Section 4.2.3** Predominant wind direction Southeast Windrose diagram is shown as **Figure 4-1.**
24.	The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.	The water requirement for the project is addressed in **Chapter 2, Section 2.11.2**and**Table 2-16.**
25.	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	No ground water withdrawal to meet the water requirement. The required water will be procured from authorized vendors.
26.	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	Water conservation measures are proposed in **Chapter 4** and **Section 4.3.** Rainwater harvesting detailed are provided in **Chapter 3, Section 4.3.2.3**.
27.	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.	Impacts on water environment & water conservation measures are proposed in **Chapter 4, Section 4.3**.
28.	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken, and Report furnished. The Report inter-alia shall include details of the aquifers present and the impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground	The proposed depth of mining is 30m from the top of the hill. Mining activities will not intersect with ground water table as the proposed depth of mining will be 30 m from the top of hill and 8.7 m below ground level. The PP will provide the Hydro Geological Study report during Final EIA Submission.

	water should also be obtained and copy furnished.	
29.	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.	Not Applicable. There are no streams, or seasonal streams passing through the projectarea since it is hilly terrain. However, TAMIN provided all safety measures for nearby water bodies are provided in **Chapter 4, Section 4.3.**
30.	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.	Site Elevation: 794 – 817m AMSL, the proposed Depth of Mining is 30m as per the approved Mining Plan. Ground water table is available at 8.7m BGL. Salient features of the sites are given in **Chapter 2, Table 2-2.**
31.	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. A phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	About 0.80.00 Ha of area is proposed for Green Belt development. It proposed to plant 1200 No's of trees. Detailed Green Belt Development plan is given in **Chapter 2, Section 2.16.8Table 2-22.**
32.	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangements for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.	Impacts and mitigation measures on transportation is given in **Chapter 4, Section 4.11.1.**
33.	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	Sanitation facilities are provided to mine's workers in temporary structures is allocated for infrastructure within the lease area. The area breakup details are given in **Chapter-2**, **Section 2.11.1, Table 2-15**.
34.	Conceptual post mining land use and	Conceptual post mining land use and Reclamation and

	Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.	restoration sectional plates are enclosed as **Annexure-5.**The plans and with adequate number of sections are provided in**Error! Reference source not found. to Figure 2-19.**
35.	The Occupational Health impacts of the Project should be anticipated, and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Occupational Health impacts & preventive measures detailed given in **Chapter 4** and **Section 4.10.** The EMP details are given as a separately as **Chapter 10** along with EMP Cost details are provide in **Section 10.14,** **Table** 10-1**.**
36.	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	Occupational Health impacts & preventive measures detailed given in **Chapter 4** and **Section 4.10.** The EMP details are given as a separately as **Chapter 10** along with EMP Cost details are provide in **Section 10.14,** **Table 10-1.**
37.	Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	Impacts and measures are addressed in **Chapter 4** and **Section 4.5** and **Section 4.9**.
38.	Detailed Environmental Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.	The EMP details are given as a separately as **Chapter 10.**
39.	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project	The draft EIA is prepared as per obtained ToR and will be submitted for public hearing to TNPCB.After completing public hearing and obtaining minutes the point wise proponent compliance will be enclosed in the Final EIA.
40.	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	There is no litigation pending against the project.
41.	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	The project Cost is addressed in **Chapter 2** and **Section 2.8, Table 2-13.**
42.	A Disaster management Plan shall be prepared and included in the EIA/EMP	Disaster Management Plan is given in **Chapter 7** and **Section 7.1.2.**

	Report.	
43.	The benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Project benefits are given in **Chapter 8.**
44.	Besides the above, the below mentioned general points are also to be followed: -	
a)	Executive Summary of the EIA/EMP Report	Executive Summary of EIA Report enclosed separately.
b)	All documents to be properly referenced with index and continuous page numbering.	All documents addressed with properly referenced with index and continuous page numbers.
c)	Where data are presented in the Report especially in Tables, the period in which the data were collected, and the sources should be indicated.	Yes, sources for all tables are addressed.
d)	Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.	All the analysis/testing reports of Water, Soil, Air, Noise etc. are conducted by MoEF&CC& NABL accredited laboratories. The disclosure of consultant is given in **Chapter 12.**
e)	Where the documents provided are in a language other than English, an English translation should be provided.	The entire document is prepared in English only.
f)	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	Questionnaire for environmental appraisal of mining projects will be prepared as per prescribed format issued by SEAC
g)	While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA. II(I) dated 4th August 2009, which are available on the website of this Ministry, should be followed.	EIA is Prepared as per generic structure prescribed in **Appendix–III** of EIA Notification 2006 and covered all ToR Compliance.
h)	Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the ToR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.	Noted.
i)	As per the circular no. J-11011/618/2010-IA. II(I) dated 30.5.2012, certified report of the	Not Applicable, as it is a new project.

	status of compliance of the conditions stipulated in the Environment Clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.	
j)	The EIA report should also include (i) surface plan of the area indicating contours of main topography features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.	All the Sectional Plates are enclosed as **Annexure- 7.**

In addition to the above, the following shall be furnished: -
The Executive summary of the EIA/EMP report in about 8-10 pages should be prepared incorporating the information on following points:

1.	Project name and location (Village, District, State, Industrial Estate (if applicable).	Noted and followed the same.
2.	Products and capacities. If expansion proposal, then existing products with capacitiesand reference to earlier EC.	Noted.
3.	Requirement of land, raw material, water, power, fuel, with source of supply (Quantitative)	Noted and followed the same.
4.	Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.	Noted and followed the same.
5.	Measures for mitigating the impact on the environment and mode of discharge or disposal.	Noted and followed the same.
6.	Capital cost of the project, estimated time of completion.	Noted and followed the same.
7.	Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of is acquisition, nearby (in 2-3 km.) water body, population, with in 10km other industries, forest, eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)	Noted and followed the same.
8.	Baseline environmental data air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population.	Noted and followed the same.
9.	Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.	Noted and followed the same.

10.	Likely impact of the project on air, water, land, flora-fauna and nearby population.	Noted and followed the same.
11.	Emergency preparedness plan in case of natural or in plant emergencies	Noted and followed the same.
12.	Issues raised during public hearing (if applicable) and response given	Noted and followed the same.
13.	CER plan with proposed expenditure.	Noted and followed the same.
14.	Occupational Health Measures.	Noted and followed the same.
15.	Post project monitoring plan.	Noted and followed the same.
Besides the above, the below mentioned general points should also be followed: -		
a.	A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.	Noted and followed the same.
b.	All documents may be properly referenced with index, page numbers and continuous page numbering.	Noted and followed the same.
c.	Where data are presented in the report especially in tables, the period in which the data were collected, and the sources should be indicated.	Noted and followed the same.
d.	While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF& CC vide O.M. No. J-11013/41/2006-IA.II (1) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.	Noted and followed the same.
e.	The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J-11013/77/2004-IA-II(1) dated 2nd December, 2009, 18th March 2010, 28th May 2010, 28th June 2010, 31 December 2010 & 30th September 2011 posted on the Ministry's website http://www.moef.nic.in/ may be referred.	EIA Report is prepared by NABET accredited Consultant, The Consultancy Laboratory is being certified by MoEF&CC& NABL accredited. The disclosure of consultant is given in **Chapter 12**.
	• After preparing the EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification,	Noted.

	2006) covering the above-mentioned points, the proponent will take further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.	
	• The final EIA report shall be submitted to the SEIAA, Tamil Nadu for obtaining Environmental Clearance.	Noted and followed the same.
	• The TORs with public hearing prescribed shall be valid for a period of three years from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I) (part) dated 29th August 2017.	Noted and followed the same.

2 PROJECT DESCRIPTION

2.1 Type of Project including interlinked and interdependent projects

There are no Interlink and interdependent projects in this color granite quarry. Lease land/quarry land is overextend of 27.04.5 Ha. The color granite quarry follows semi mechanizedopen cast method by formation of benches. Benches are proposed with a height of 6m & widthbench not less than the height. The area applied for quarry lease is exhibits hilly terrain; thealtitude in SF No. 486(p)&736/4 is 794 – 817m AMSL.

Total estimated Geological reserves are 37,00,465m^3. Total Mineable Reserves are estimated as 29,53,169m^3. Maximum production of 10400m^3 of ROM during the first five years of Mining plan period at the rate of 25% recovery and 2500m^3 of recoverable production of granite per annum. Summary of quarry reserves is given in **Table 2-1**.

The extent of the Quarry lease area is 27.04.5 Ha. The Quarry is located at Jakkery Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu State. Quarry lease area falls in the survey of India Toposheet no 57-H/14, H/15and lies between the GPS coordinates of 12°33’54.13” N & 12°33’39.44” N and 77°52’14.17” E & 77°52’14.17” E.

Table 2-1 Summary of Project Reserves

S. No	Description	Quantity (m^3)
Geological Reserves:		
1	Geological Reserves (ROM)	37,00,465
2	Geological Reserves (at 25% Recovery)	9,25,116
Mineable Reserves:		
1	Mineable Reserves (ROM)	29,53,169
2	Mineable Reserves (at 25% Recovery)	7,38,292
3	Total Production for proposed 5 Year	10400
4	Annual Peak Production (at 25%)	2500

2.2 Need of the Project

The granite dimensional stone material by virtue of its pleasing color and texture and its best ability to take polishing and appealing look in polished product has attracted the consumers in the building construction and interior decoration industries. The domestic market capabilities have also been explored in recent periods. Bulk quantity of the blocks is produced and exported as raw blocks, and some quantity is being processed at TAMIN’s Granite processing units and exported as value added finished products.

Mineral Industries of the state of Tamil Nadu provides employment opportunities for the people of thestate as well as in the specific project area. The Quarrying is one among the

major core sectorfor industries, which plays a vital process of country's economic development.

2.3 Location of the Quarry

The Quarry is located at S. F. No. 486 (Part) & 736/4, Jakkery Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu State. Quarry lease area falls in the survey of India Toposheet no 57-H/14, H/15 and lies between the GPS coordinates of 12°33'54.13" N & 12°33'39.44" N and 77°52'14.17" E & 77°52'14.17" E. The area applied for quarry lease is exhibits hilly terrain; thealtitude is 794 – 817m AMSL.

The boundary coordinates of the site are shown in **Table 1-5**. The project location map is given in **Figure 2-1**. Google image of the lease area is shown **Figure 2-2**. 500m radius Google imagery of the lease area is shown in **Figure 2-3**. Google Imagery of 1, 5 & 10km radius of the lease area is shown in **Figure 2-4, Figure 2-5 &Figure 2-6**respectively. Environmental Sensitive areas within 15km radius of the lease area demarcated on Google image is shown in **Figure 2-7**. Topo map of the study is shown in **Figure 2-9**. Salient Features within 15km radius of the project boundary is given in **Table 2-2**. Project Summary is provided **Table 2-1**.

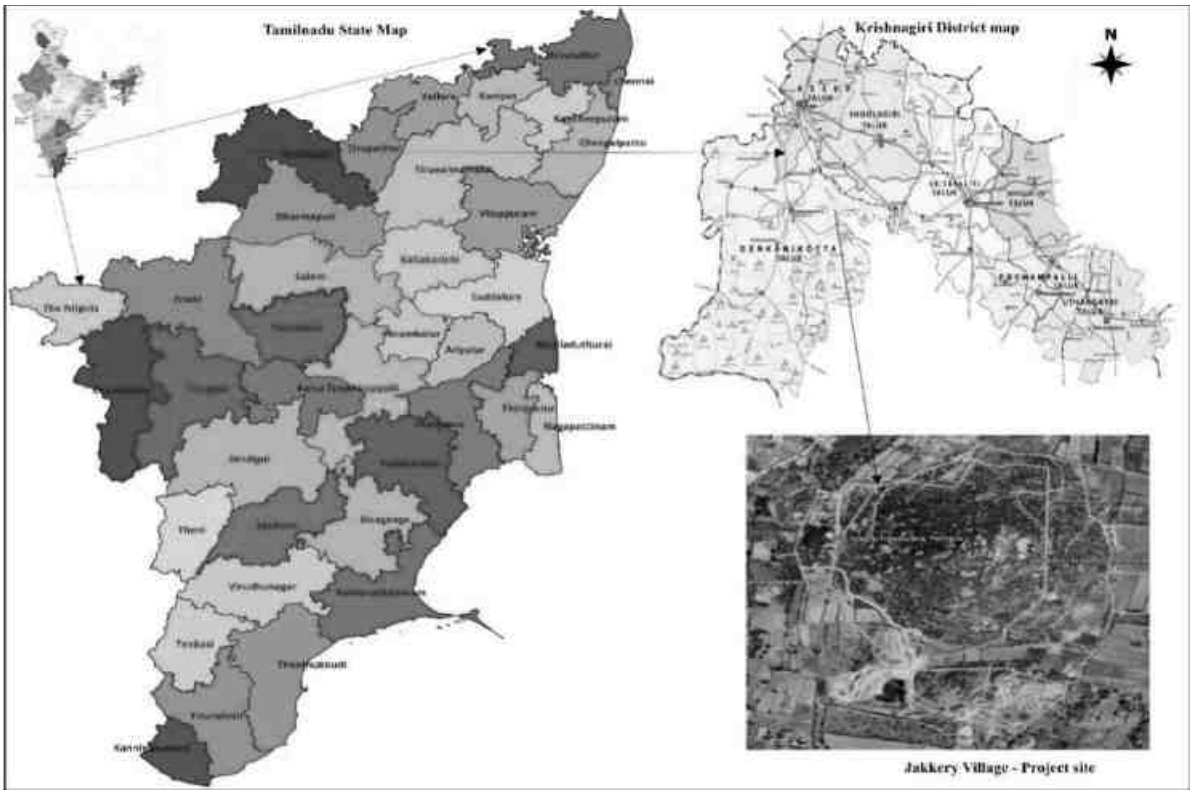

Figure 2-1 Project site Location map

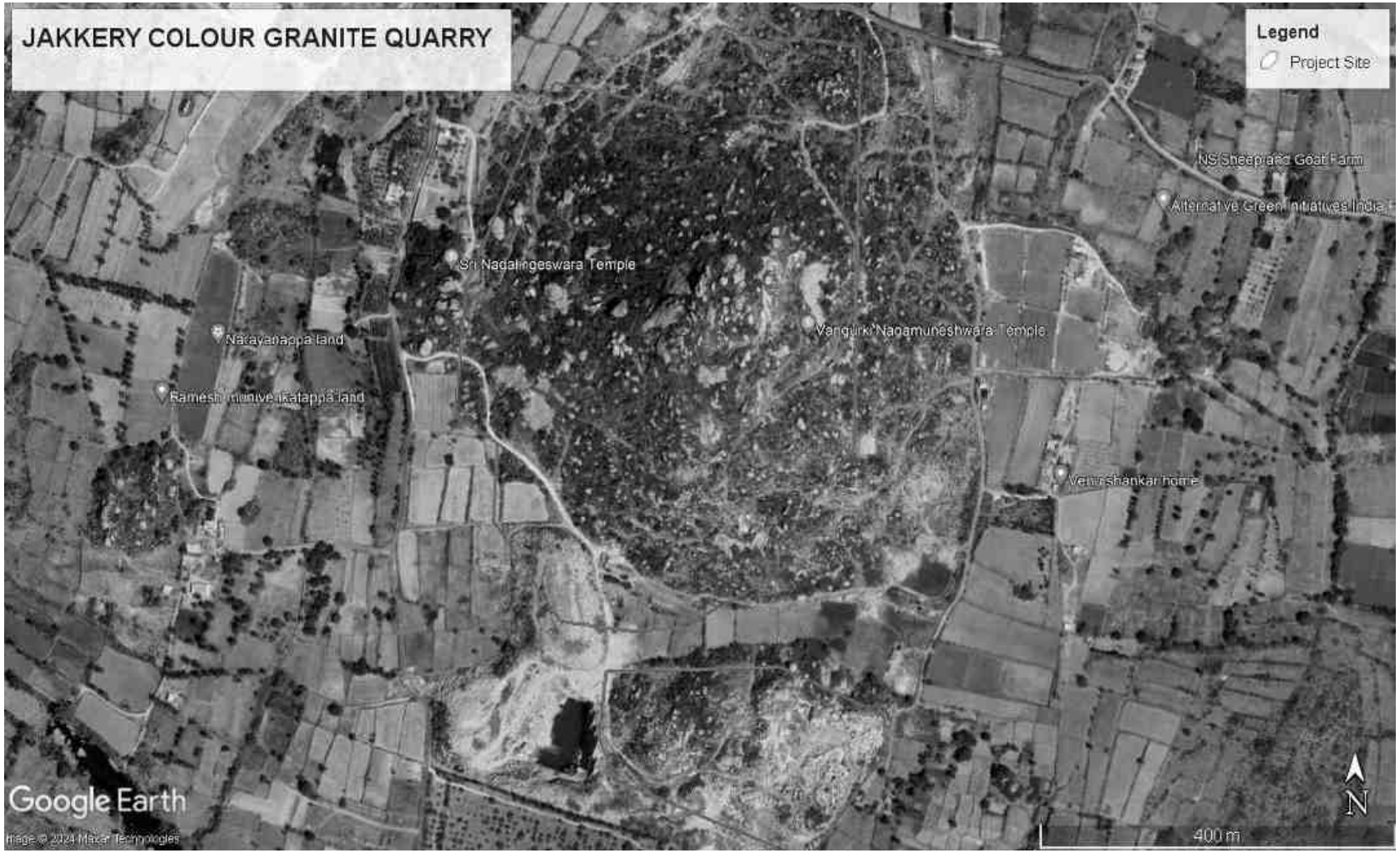

Figure 2-2 Google image of the lease area

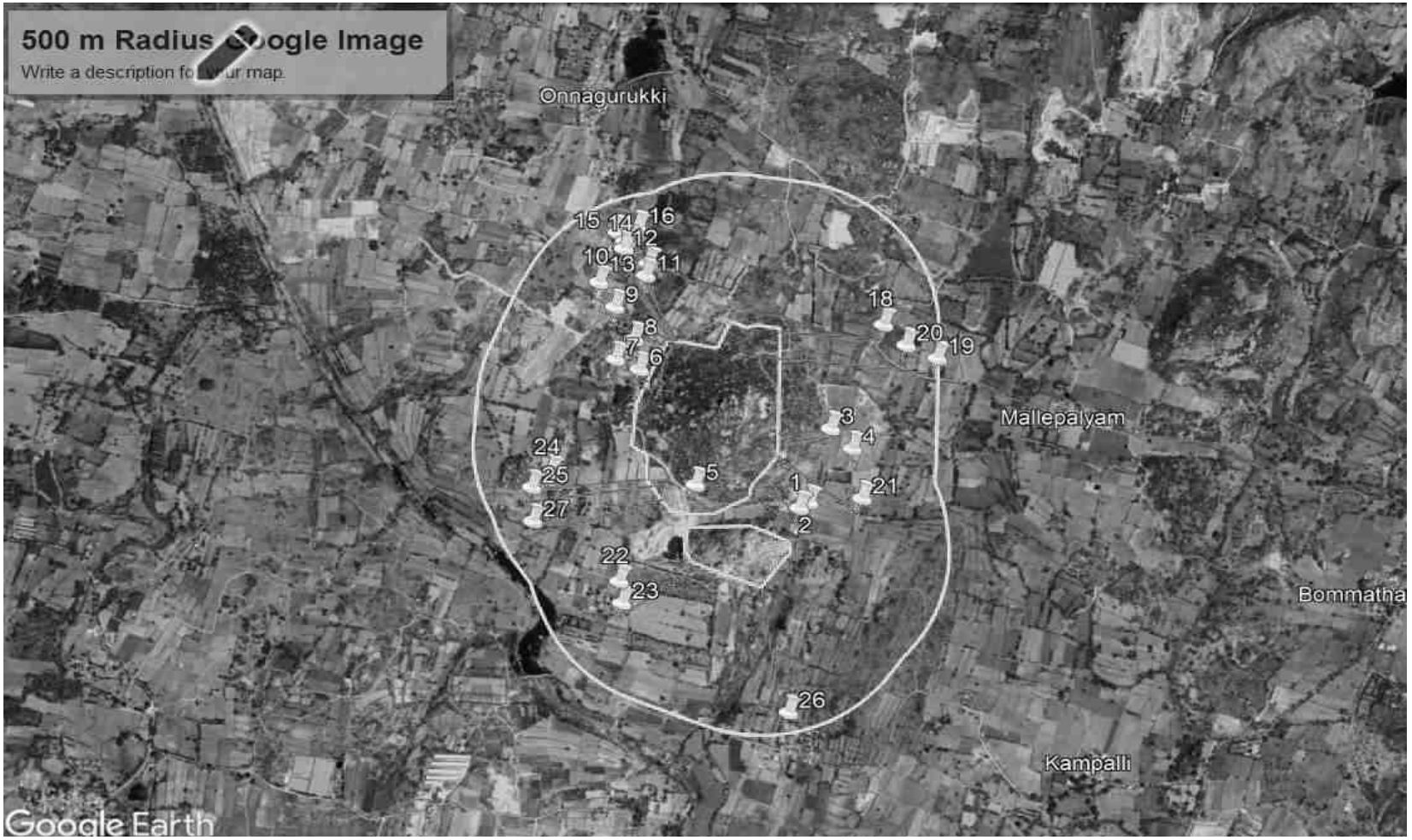

Figure 2-3 500m radius google imagery map of the lease area

Figure 2-4 1km radius google imagery map of the lease area

Figure 2-5 5km radius google imagery map of the lease area

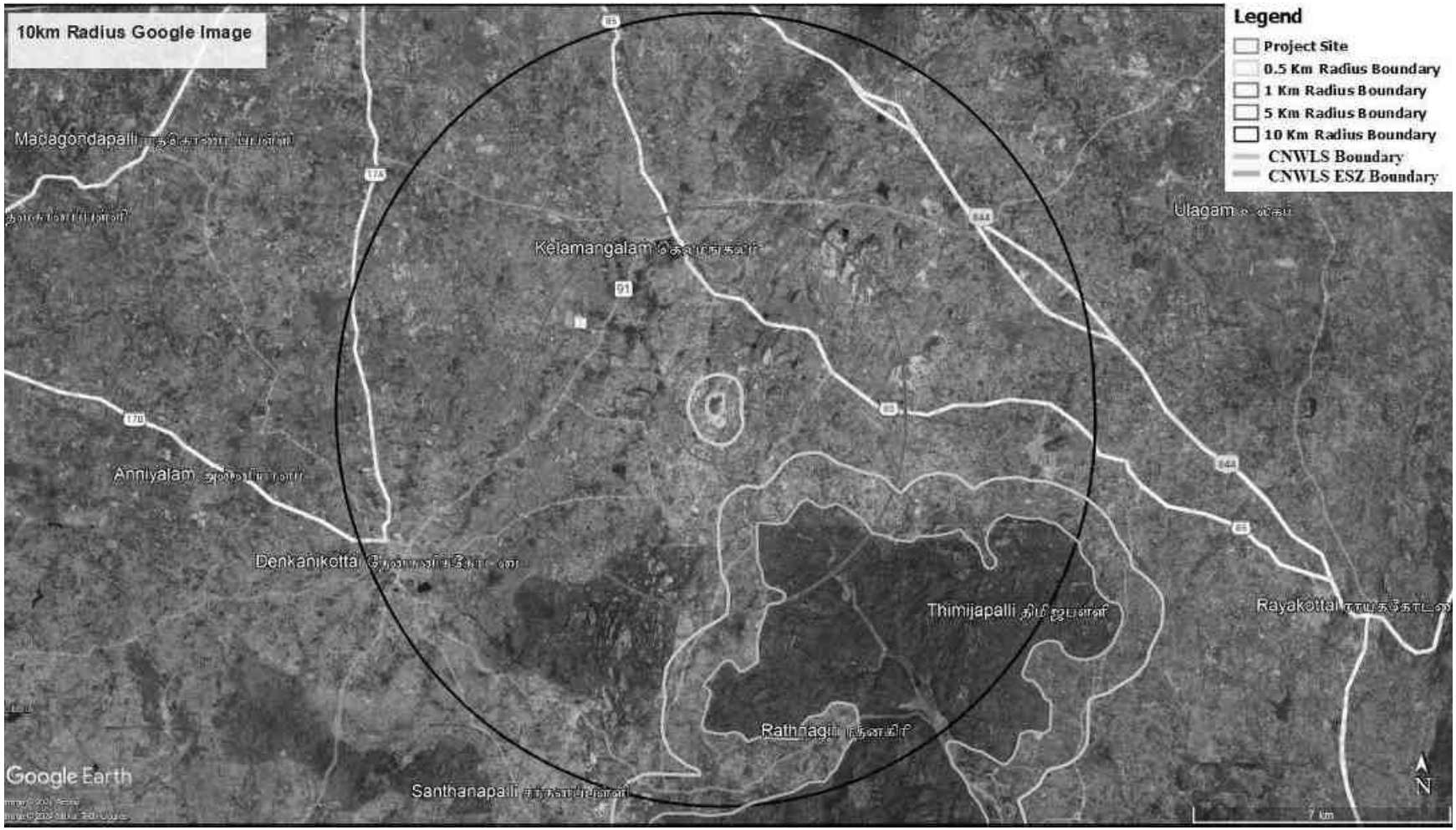

Figure 2-6 10 km radius google imagery map of the lease area

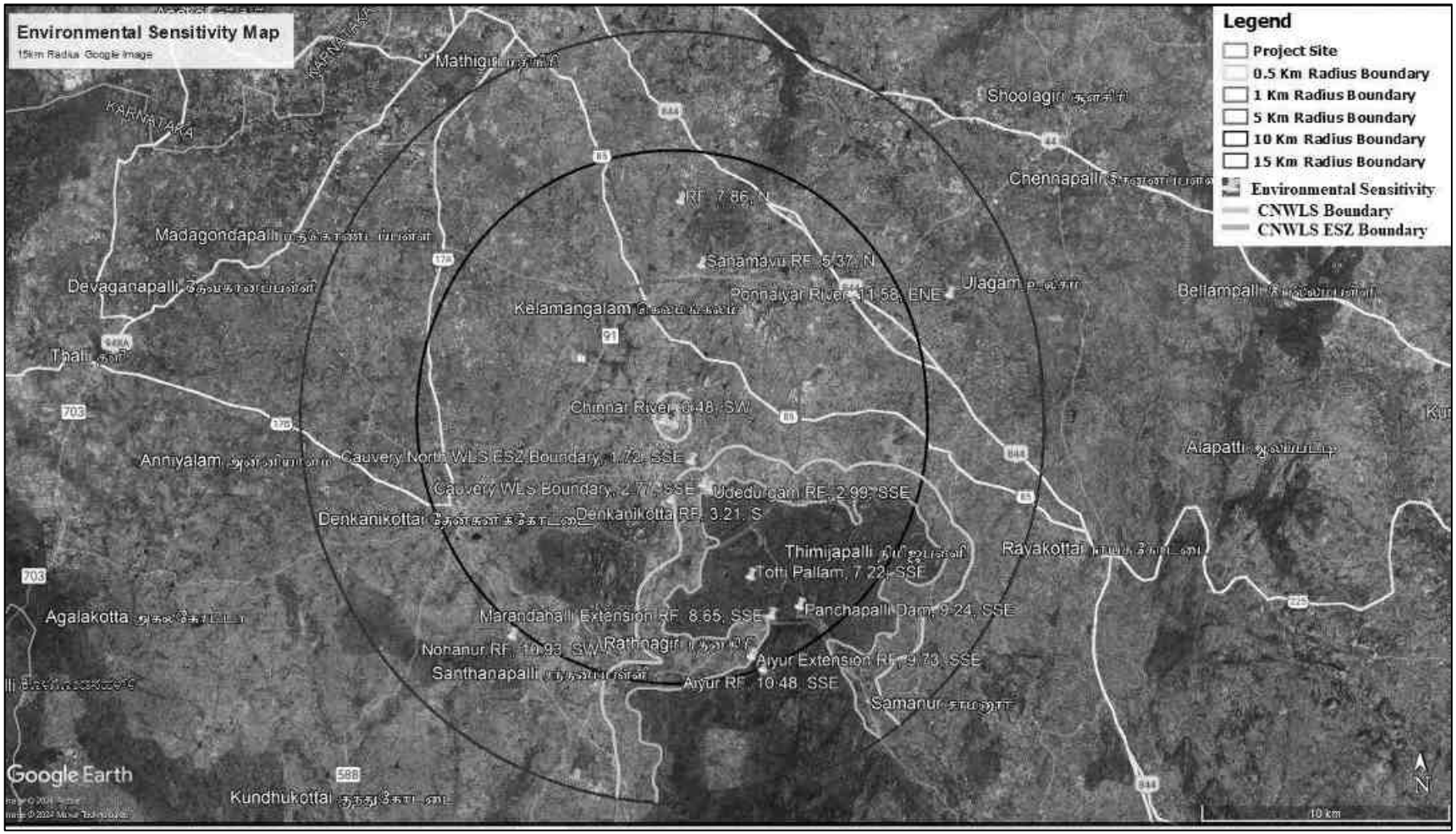

Figure 2-7 Environmental Sensitivity map of the study area

Figure 2-8 Project Site photographs

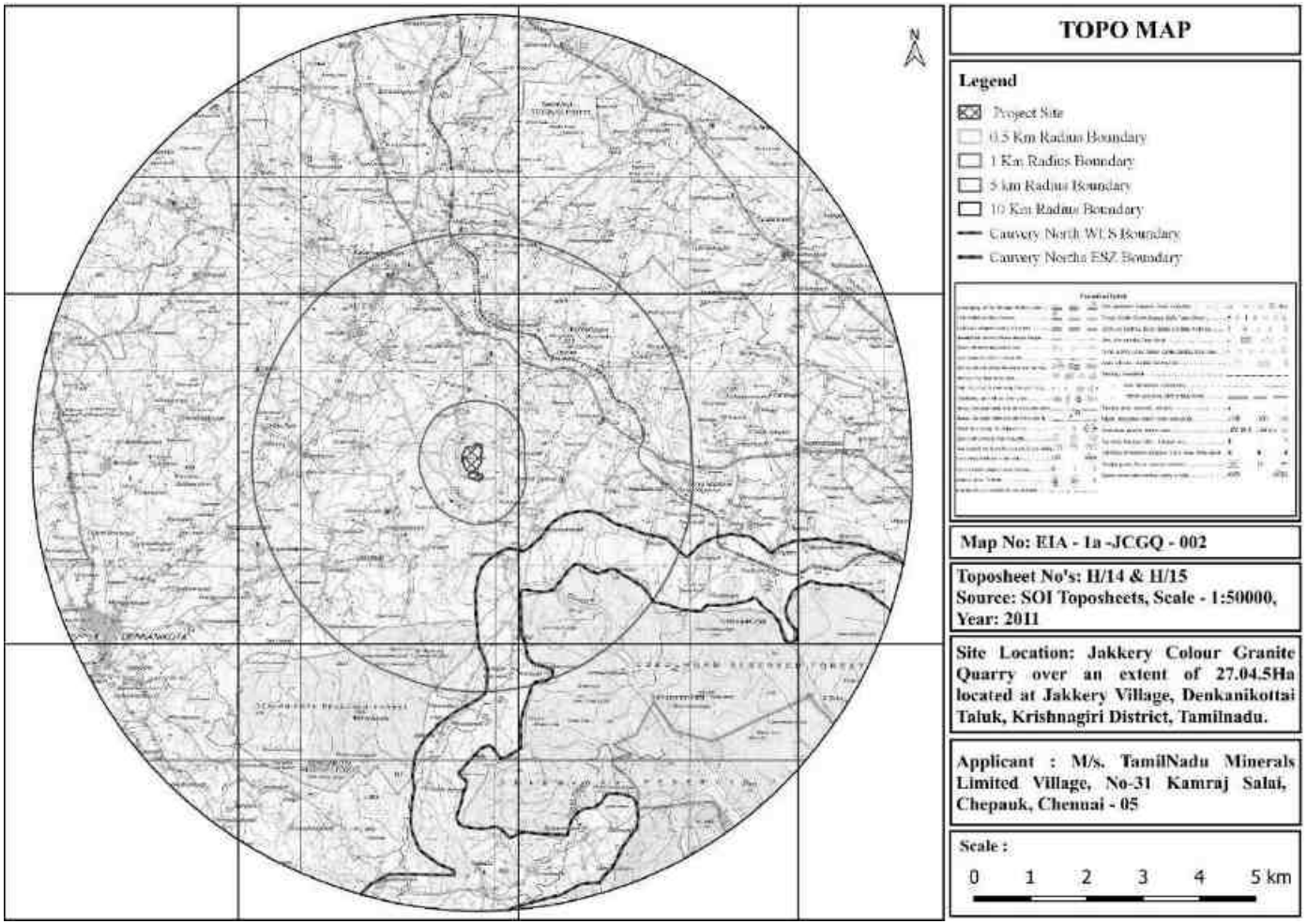

Figure 2-9 Topo map of the study area

Table 2-2 Salient Features within 15km radius of the lease area

<table>
<tr><th>S. No</th><th>Particulars</th><th>Details</th></tr>
<tr><td>1</td><td>Latitude & Longitude</td><td>12°33’54.13” N & 12°33’39.44” N
77°52’14.17” E & 77°52’14.17” E</td></tr>
<tr><td>2</td><td>Site Elevation above MSL (m)</td><td>794 - 817 AMSL.</td></tr>
<tr><td>3</td><td>Topography</td><td>Hilly terrain</td></tr>
<tr><td>4</td><td>Lease area Topo Sheet details</td><td>57-H/14, H/15</td></tr>
<tr><td>5</td><td>Land classification</td><td>Government Poramboke land</td></tr>
<tr><td>6</td><td>Nearest highway</td><td>SH-85: Attibelle - Royakottai Road~ 2.19km (NNE)
NH 44: Srinagar (Jammu & Kashmir) - Kanyakumari (Tamilnadu) ~ 14.45Km (NNE)</td></tr>
<tr><td>7</td><td>Nearest Railway station</td><td>PeriyaNagathunai Railway Station ~ 4.08Km (E)</td></tr>
<tr><td>8</td><td>Nearest Airport</td><td>Hosur Airport - 14.31Km, NW</td></tr>
<tr><td>9</td><td>Nearest Town / City</td><td>Hosur - 17.18 Km, NNW</td></tr>
<tr><td>10</td><td>Areas which are important or sensitive for ecological reasons – Wetlands, Watercourses or other water bodies, coastal zone, biospheres, mountains, forests</td><td>
<table>
<tr><th>S. No</th><th>Description</th><th>Distance (km)</th><th>Direction</th></tr>
<tr><td>1</td><td>Lake near Puvanapalli</td><td>2.61</td><td>WSW</td></tr>
<tr><td>2</td><td>Lake near DoddeGaunapalli</td><td>3.58</td><td>NNW</td></tr>
<tr><td>3</td><td>Lake near Bitireddi</td><td>4.04</td><td>W</td></tr>
<tr><td>4</td><td>Kelamangalam Lake</td><td>4.09</td><td>NNW</td></tr>
<tr><td>5</td><td>Lake near Gopasandram</td><td>4.09</td><td>NNW</td></tr>
<tr><td>6</td><td>Lake near Narappanatti</td><td>5.17</td><td>S</td></tr>
<tr><td>7</td><td>Lake near Kelamangalam RS</td><td>5.33</td><td>N</td></tr>
<tr><td>8</td><td>Lake near Varaganapalli</td><td>5.46</td><td>E</td></tr>
<tr><td>9</td><td>Lake near D. Kottappalli</td><td>6.47</td><td>N</td></tr>
<tr><td>10</td><td>Lake near Tuppuganappalli</td><td>6.71</td><td>NE</td></tr>
<tr><td>11</td><td>Lake near Timmasandiram</td><td>6.99</td><td>SW</td></tr>
<tr><td>12</td><td>Nagamangalam Lake</td><td>7.41</td><td>E</td></tr>
<tr><td>13</td><td>Lake near Kommepalli</td><td>8.2</td><td>NNE</td></tr>
<tr><td>14</td><td>Lake near Uddanapalli</td><td>8.43</td><td>ENE</td></tr>
<tr><td>15</td><td>Lake near Denkanikottai</td><td>8.77</td><td>WSW</td></tr>
<tr><td>16</td><td>Panchapalli Dam</td><td>9.24</td><td>SSE</td></tr>
<tr><td>17</td><td>Lake near Jonbanda</td><td>12.27</td><td>N</td></tr>
<tr><td>18</td><td>Lake near Pillyakottur</td><td>13.97</td><td>NE</td></tr>
<tr><td>19</td><td>Lake near Kamandoddi</td><td>14.1</td><td>NNE</td></tr>
<tr><td>20</td><td>Lake near Eripanchapalli</td><td>14.34</td><td>SE</td></tr>
</table>
</td></tr>
</table>

11	Reserve Forests	**S. No**	**Description**	**Distance (km)**	**Direction**
		1	Udedurgam RF	2.99	SSE
		2	Marandahalli Extension RF	8.65	SSE
		3	Aiyur RF	10.48	SSE
		4	Aiyur Extension RF	9.73	SSE
		5	Denkanikotta RF	3.21	S
		6	Nohanur RF	10.93	SW
		7	Sanamavu RF	5.37	N
		8	RF	7.86	N
12	Seismic Zone	Zone-II (Low risk)			
13	Defense Installations	Nil within 15 km radius			
14	Interstate Boundary	Nil within 15 km radius			
15	HACA Regions	HACA Clearance Letter is enclosed as **Annexure 11.**			

Table 2-3 The structures are located within 50m, 100m, 150m, 200m, 250m, 300m and 500m from the boundary of the mine lease area

Distance Range	No. of Structures	Type of Structures (Kuchcha/ Brick/ Cement/ RCC/ Framed Structures)	Ownership (Belongs to PP/ Not belongs to PP)	Remarks
0-50m	2	Workers Shed, House	1. Belongs to PP 2.Not belongs to PP	Nil
50-100m	1	House	Not belongs to PP	Nil
100-200m	6	House, Water Tank	Not belongs to PP	Nil
200-300m	5	House, Temple, Motor Room	Not belongs to PP	Nil
300-400m	10	House	Not belongs to PP	Nil
400-500m	3	House, Temple	Not belongs to PP	Nil

Figure 2-10 Photographs of the Structures within the 500m radius of the project

Table 2-4 List of Trees located within the 300 m from the boundary of the mine lease area

S. No.	Scientific Name	Common Name	Age (yrs)	Diameter (cm)	No's
1	*Azadirachta indica*	Neem Tree	5-6	12-35	165
2	*Mangifera indica*	Mango Tree	2-3	10-25	20
3	*Cocos nucifera*	Coconut Tree	1-10	12-35	133
4	*Tectona grandis*	Teak	2-6	11-18	30
5	*Pongamia pinnata*	Pongam Tree	3-5	10-19	214
6	*Mimusopselengi L*	Spanish cherry Tree	1-3	8-15	50
7	*Syzygiumcumini*	Jamun Tree	2-4	9-15	20
8	*Carica papaya*	Papaya Tree	2-3	12-18	40
9	*Eucalyptus globulus*	Eucalyptus	1-5	7-13	20
10	*Senna auriculata*	Cassia	1-2	10-21	150
11	*Ziziphus glabrata*	Karukattan	3-7	5-20	200

Figure 2-11Photographs of Trees located within the 300 m from the boundary of the mine lease area

Table 2-5 List of Water Bodies located within the 300 m from the boundary of the mine lease area

S. No	Description	Distance (~m)	Direction	Depth of Well (ft)	Water Depth (ft)
1	Open Well	0.56	E	40	38
2	Open Well	0.83	E	50	35
3	Open Well	0.88	ESE	45	25
4	Open Well	0.61	E	45	18
5	Open Well	0.32	E	25	15
6	Open Well	0.71	ESE	45	17
7	Open Well	0.90	ESE	50	23
8	Open Well	0.47	SSW	55	12
9	Open Well	0.79	SSW	35	15
10	Open Well	0.82	SSW	40	33
11	Open Well	0.97	WSW	60	40
12	Open Well	0.44	NW	30	20
13	Open Well	0.72	NNW	35	13
14	Open Well	0.65	ENE	45	19
15	Borewell	0.69	S	420	150
16	Borewell	0.94	W	460	170
17	Borewell	0.95	E	500	160
18	Borewell	0.86	SSE	450	180
19	Borewell	0.60	NNW	480	200

Table 2-6 Project summary

S. No	Particulars	Details
1.	Project Location	S. F. No. 486 (Part) & 736/4, Jakkery Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu State.
2.	Land classification	Government Poramboke land
3.	Extent of lease area (Ha.)	27.04.5
4.	Quarry Lease	Govt. Letter. No.5883890/MME.2/2023-1, dated: 14.02.2024
5.	Lease Period	20 years
6.	Estimated Geological Reserves (ROM) M^3	37,00,465
7.	Estimated Mineable Reserves (ROM) M^3	29,53,169
8.	Colour Granite production per annum M^3	RoM 2500 with25% recovery
9.	Depth of Mining	30m above ground level (from Top of the hill)
10.	Method of Mining	Open cast semi mechanized method
11.	Water Requirement (KLD)	3.5
12.	Source of Water	Authorized vendors and local panchayat
13.	Power requirement (kVA)	60
14.	Power Backup (DG set) kVA	1* 125
15.	Fuel requirements (Lts/Day)	200
16.	Manpower (Nos)	30
17.	Municipal Solid Waste Generation (kg/day)	13.5
18.	Waste Oil generation (Lts/Year)	3.0
19.	Project Cost in Lakhs	99.97

2.4 Nearest Human Settlement

The details of nearest human settlement from the project site are provided below in **Table 2-7**.

Table 2-7 Nearest Human Settlement

S. No	Name of the villages	Distance (~km) &Direction	Population (Census2011)
1	Pachapanatti	≃2.17 (SW)	3895
2	Jakkery	≃2.09 (NNE)	3957
3	Denkanikottai	≃9.72 (SW)	24252
4	Kelamangalam	≃4.21 (NNW)	13321
5	Bommathanur	≃1.84 (SE)	2463

2.5 Details of alternate sites considered

There are no alternative sites examined. Since quarry reserves are site specific.

2.6 Size or Magnitude of operation

The colour granite quarrying operations is carryout by opencast semi mechanized method by formation of benches. Benches are proposed with a height of 6m &6m. Proposed production capacity is 10400$m^3$of ROM of Colour Granite and 2500m^3 of recoverable production of granite per annum.

Mineable Reserves have been computed as 29,53,169 m^3 based on the Conceptual Plan and sections, the effective (Saleable) Mineable Reserves have been worked out as 7,38,292 $m^3$by applying the recovery factor 25% and mineable granite waste reserve 22,14,877 m^3 at recovery factor 75%. The maximum annual production per year would be 2,500 m^3 of Saleable and 10400 m^3 of ROM during the first five years of the Mining plan period at the rate of 25% recovery. The Land Use break up summarized as**Table 2-8**.

Table 2-8 Land use details of the quarryarea

S. No	Description	Present Area (Ha)	Area to be Required Mining Plan Period (Ha)
1	Mining	2.77.0	0.80.0
2	Approach Road	0.40.0	-
3	Waste Dump	1.99.0	2.36.0
4	Office Infrastructure	0.01.5	-
5	Afforestation	0.12.0	0.06.5
6	Unutilized Area	21.75.0	18.52.5
Total		**27.04.5**	**21.75.0**

2.7 Granite Reserves

The Estimated Geological reserves of colour granite estimated based on the Geological cross sections was 37,00,465m^3. By applying the 25% recovery, the updated geological effective reserves as 9,25,116m^3. The estimated mineable reserves have arrived as 29,53,169m^3 and by applying 25% recovery, the updated mineable reserves as 7,38,292m^3. The reserves during the Mining period are 10400m^3 and the recovery of reserves at 25% is 2500m^3. Granite Quarry Reserves is given in **Table 2-9.**

Estimation of Geological Reserves and Mineable Reserves at present availability is given in **Table 2-10**. Mineable Reserve are given in **Table** 2-11**.**YearwiseProductiondetailsare given in **Table 2-12.** SurfacePlan of the Quarry is given in **Figure 2-12.** Geological plan of the quarry is shown in **Figure 2-13.** Cross sectionof the quarry is shown in **Figure 2-14**. Year wise production plan is shown **Figure 2-16.** Land use and afforestation of the quarry is shown **Figure 2-17**. Conceptual Plan of the quarry area is shown as **Figure 2-18**. Mine Conceptual Section is shown as **Figure 2-19 .**Environment Plan is shown as Figure 2-20.

Progressive Quarry Closure Plan is shown as **Figure 2-21.**

Table 2-9 Granite Quarry Reserves

S. No	Description	Quantity (m^3)
Geological Reserves:		
1	Geological Reserves (ROM)	37,00,465
2	Geological Reserves (at 25% Recovery)	9,25,116
Mineable Reserves:		
1	Mineable Reserves (ROM)	29,53,169
2	Mineable Reserves (at 25% Recovery)	7,38,292
3	Total Production for proposed 5 Year	10400
4	Annual Peak Production (at 25%)	2500

2.7.1 Present Estimation

The details of estimation of Geological Reserves and estimation of Mineable Reserves as per present ground reality has been furnished with reference to the Geological Plan & Sections and Conceptual Plan & Sections as shown in Plate No.3 and Plate No.6 respectively.

Table 2-10 Estimation of Geological Reserves and Mineable Reserves at present

Year	Run of Mines in		Saleable Colour Granite Recovery @25%		Saleable Colour Granite Waste Recovery @75%	
	M3	Tonnes	M3	Tonnes	M3	Tonnes
First Year	6001	15903	1500	3975	4501	11928
Second Year	7202	19085	1800	4770	5402	14315
Third Year	8800	23320	2200	5830	6600	17490
Fourth Year	9601	25443	2400	6360	7201	19083
Fifth Year	10000	26500	**2500**	6625	7500	19875
Total	**41604**	**110251**	**10400**	**27560**	**31204**	**82691**

2.7.2 Geological Reserves

Total Geological Reserves :37,00,465m^3
Total Recoverable Reserves @25% for first five years :10400 m^3
Granite Waste @75% : 31204m^3
Topsoil : Nil

2.7.3 Mineable Reserves

Table 2-11 Mineable Reserves

Year	Section	R.L Proposed (m)	Depth Details (m)				No of benches
			Present	Proposed	Remaining	Total	
First	P'Q' & AB	790.713 to 783.113	0	7.60	22.40	30.0	1
Second	R'S' & AB	781.396 to 776.996	7.25	4.40	18.35	30.0	1
Third	X'Y' & CD	822.000 to 805.700	0	16.30	13.70	30.0	2
Fourth	X'Y' & EF	830.000 to 809.700	0	20.30	9.70	30.0	3
Fifth	X'Y' & GH	833.500 to 815.660	0	17.90	12.10	30.0	3

Total Mineable Reserves :29,53,169m^3

Total Recoverable Reserves @25% for first five years :10400m^3

Granite Waste @75% :31204m^3

Table 2-12 Year wise Production details

Year	Run of Mines in		Saleable Colour Granite Recovery @25%		Saleable Colour Granite Waste Recovery @75%	
	M3	Tonnes	M3	Tonnes	M3	Tonnes
First Year	6001	15903	1500	3975	4501	11928
Second Year	7202	19085	1800	4770	5402	14315
Third Year	8800	23320	2200	5830	6600	17490
Fourth Year	9601	25443	2400	6360	7201	19083
Fifth Year	10000	26500	**2500**	6625	7500	19875
Total	**41604**	**110251**	**10400**	**27560**	**31204**	**82691**

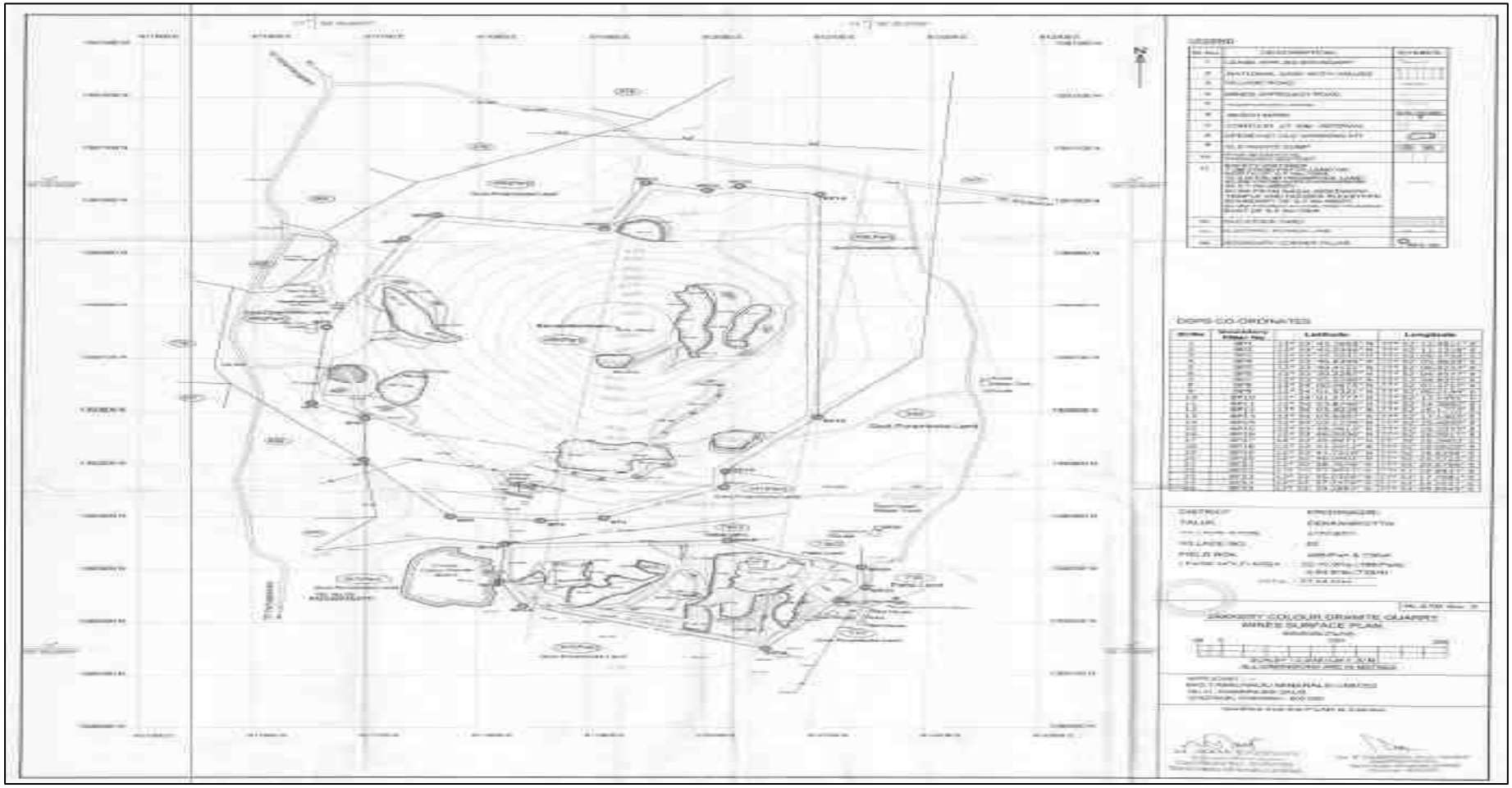

Figure 2-12 Surface Plan of the Quarry

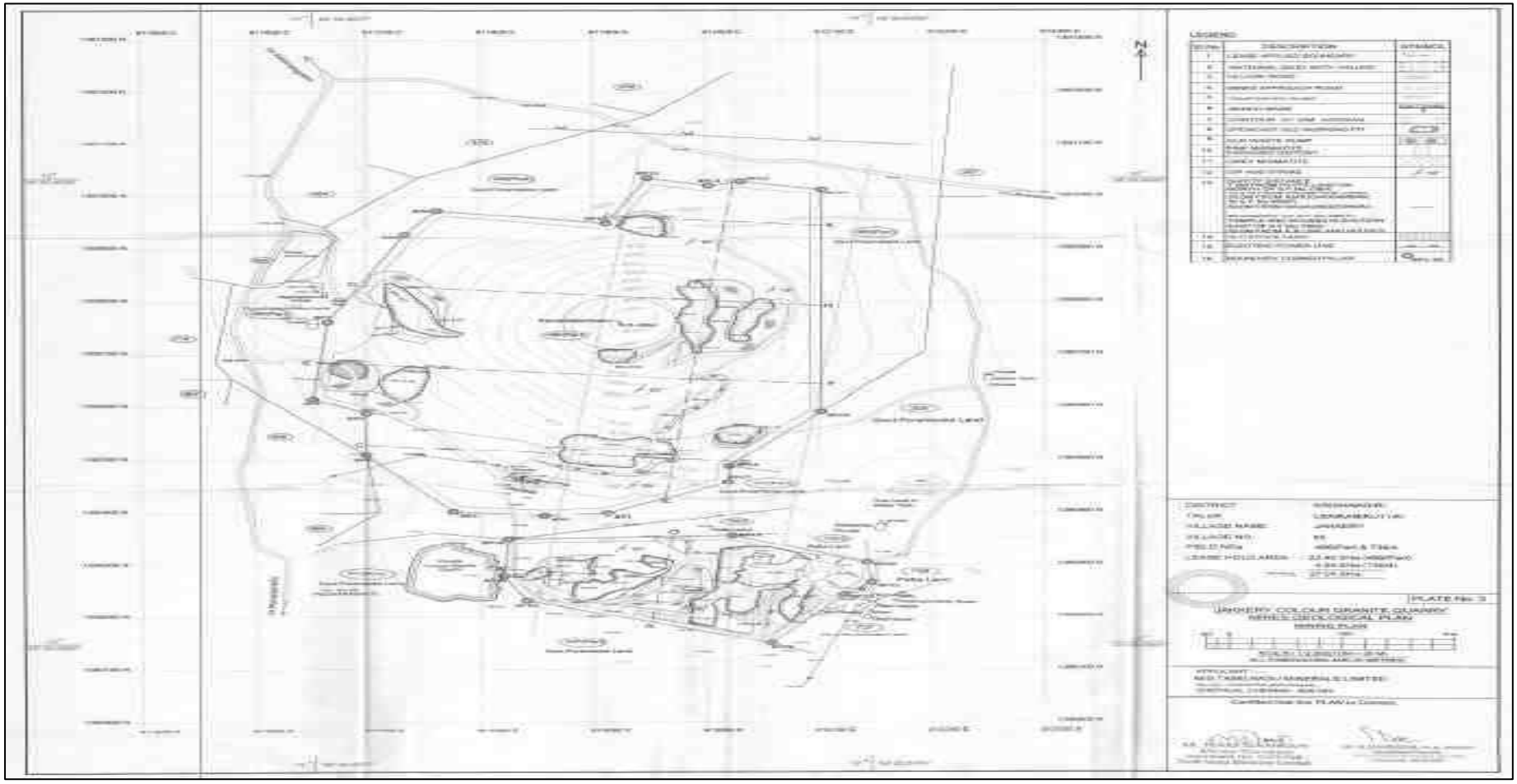

Figure 2-13 Geological plan of the quarry

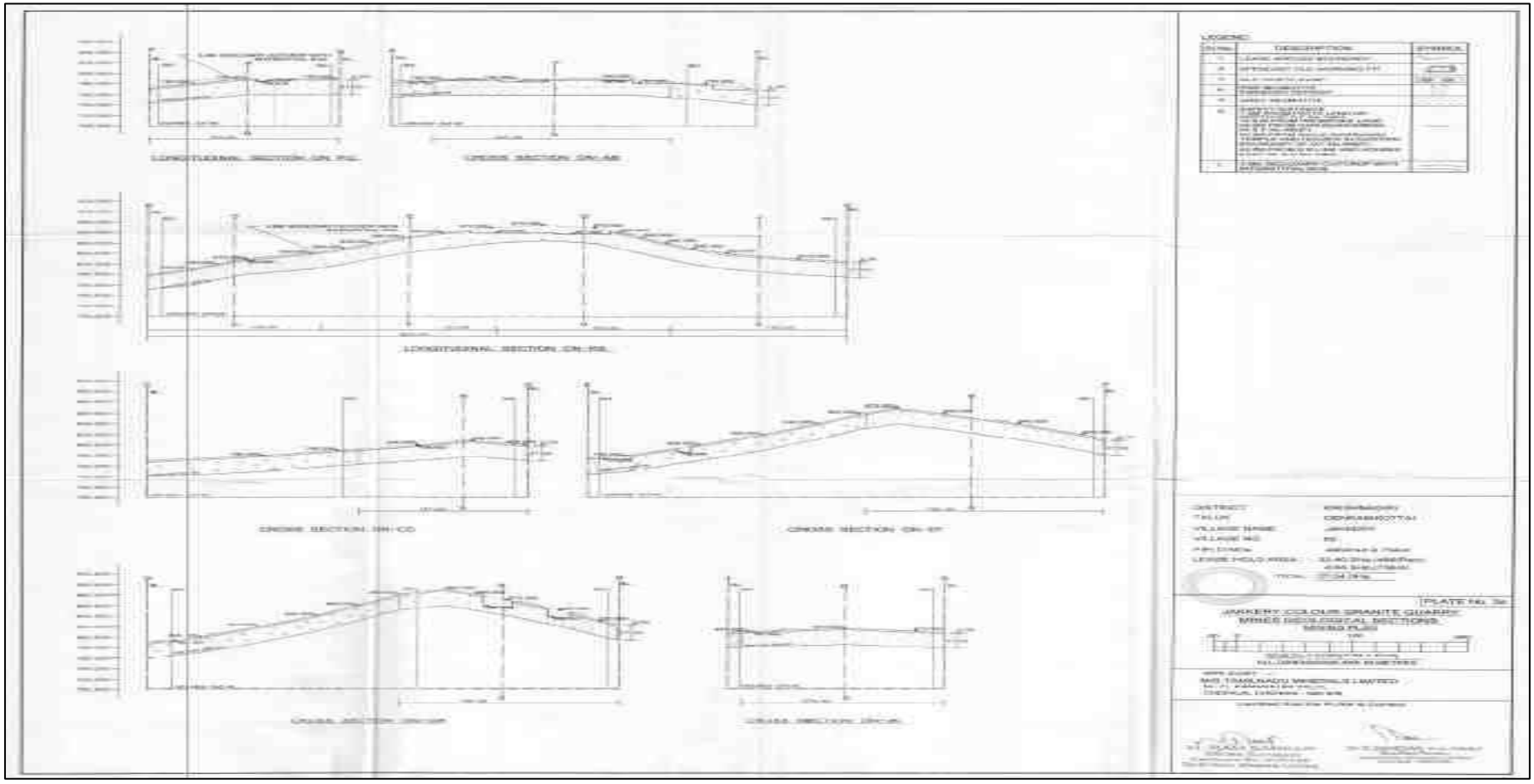

Figure 2-14 Cross section of the quarry

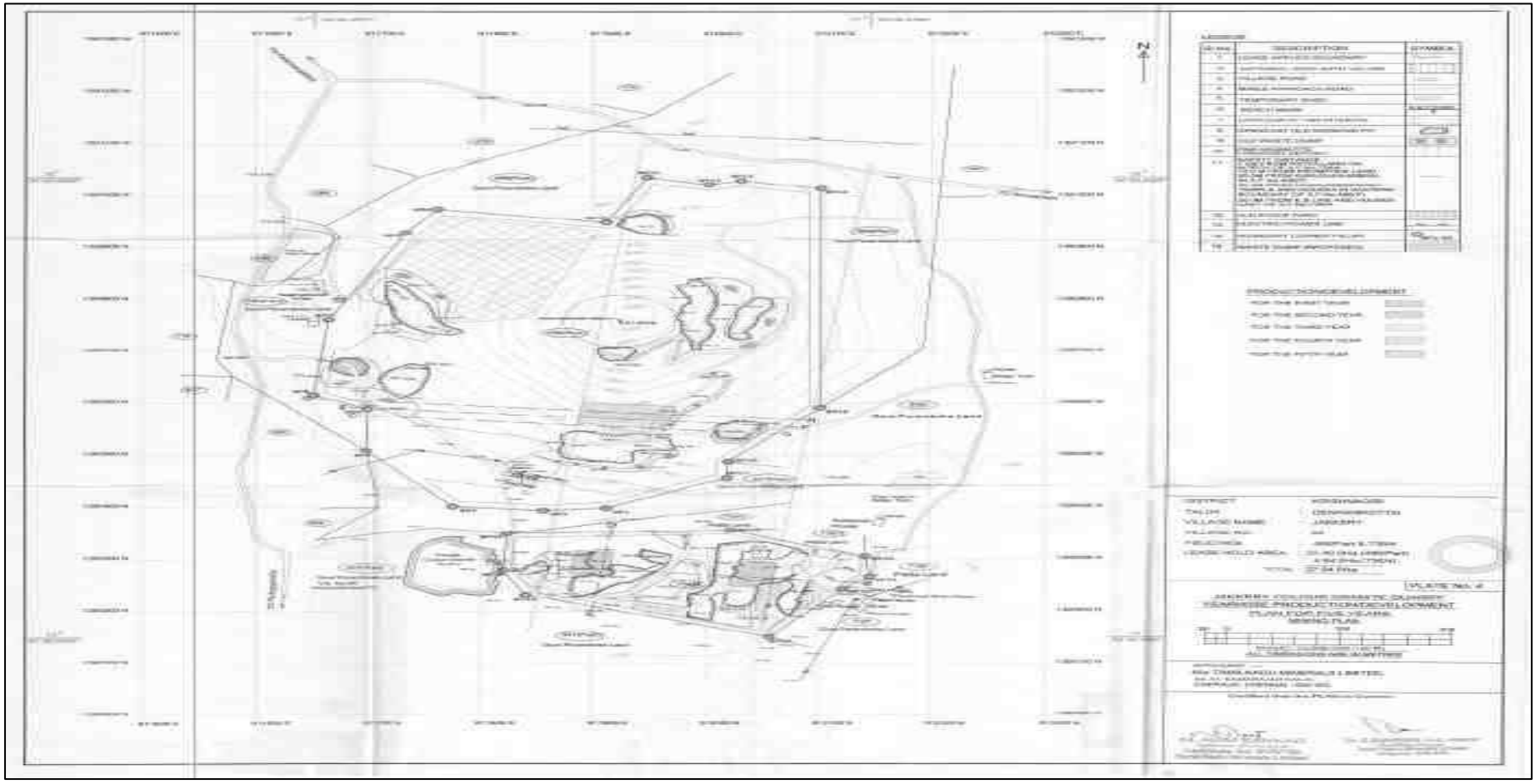

Figure 2-15 Year wise production / Development Plan for the First Five years

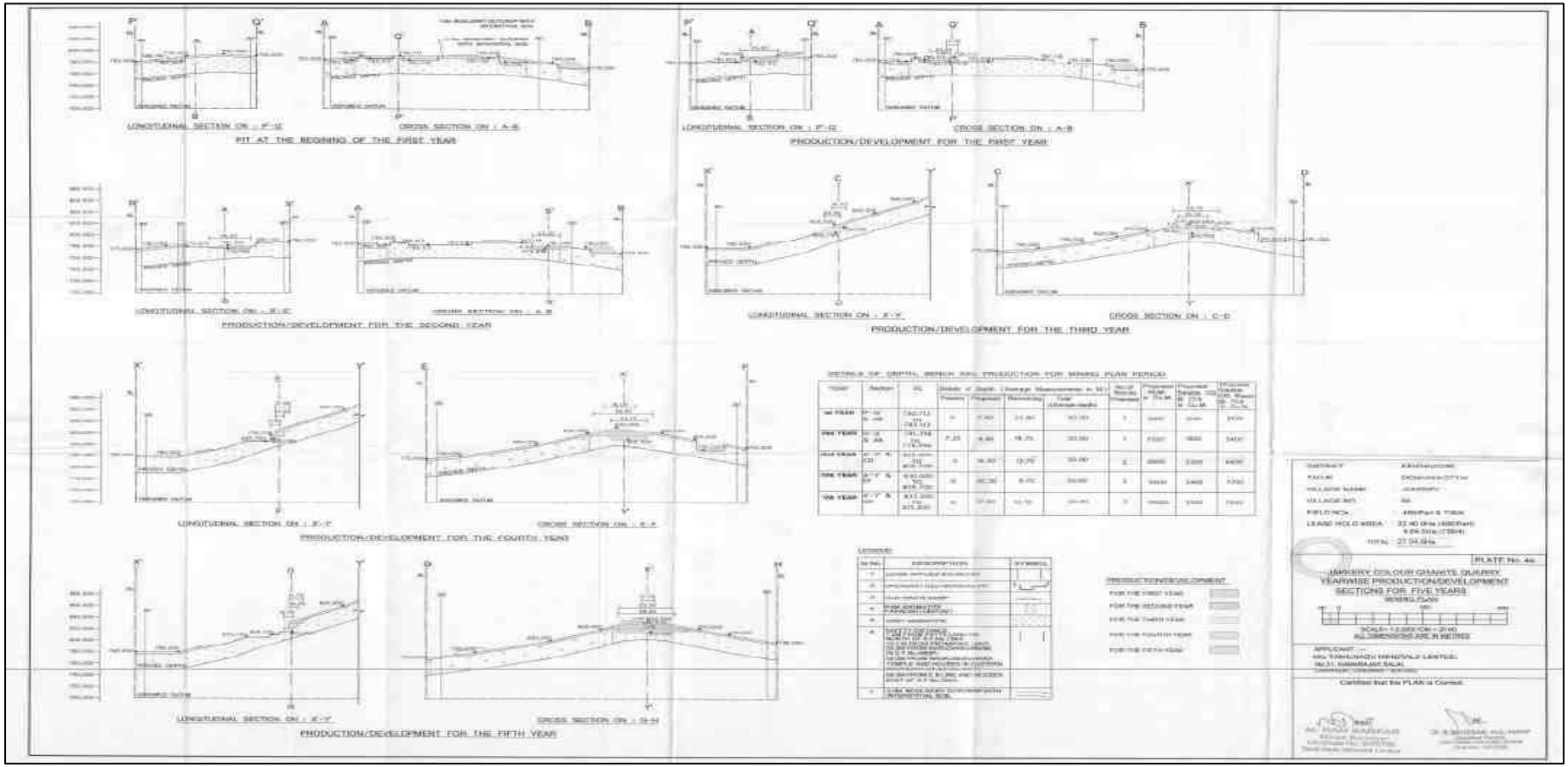

Figure 2-16 Year wise production / Development Sections for the First Five years

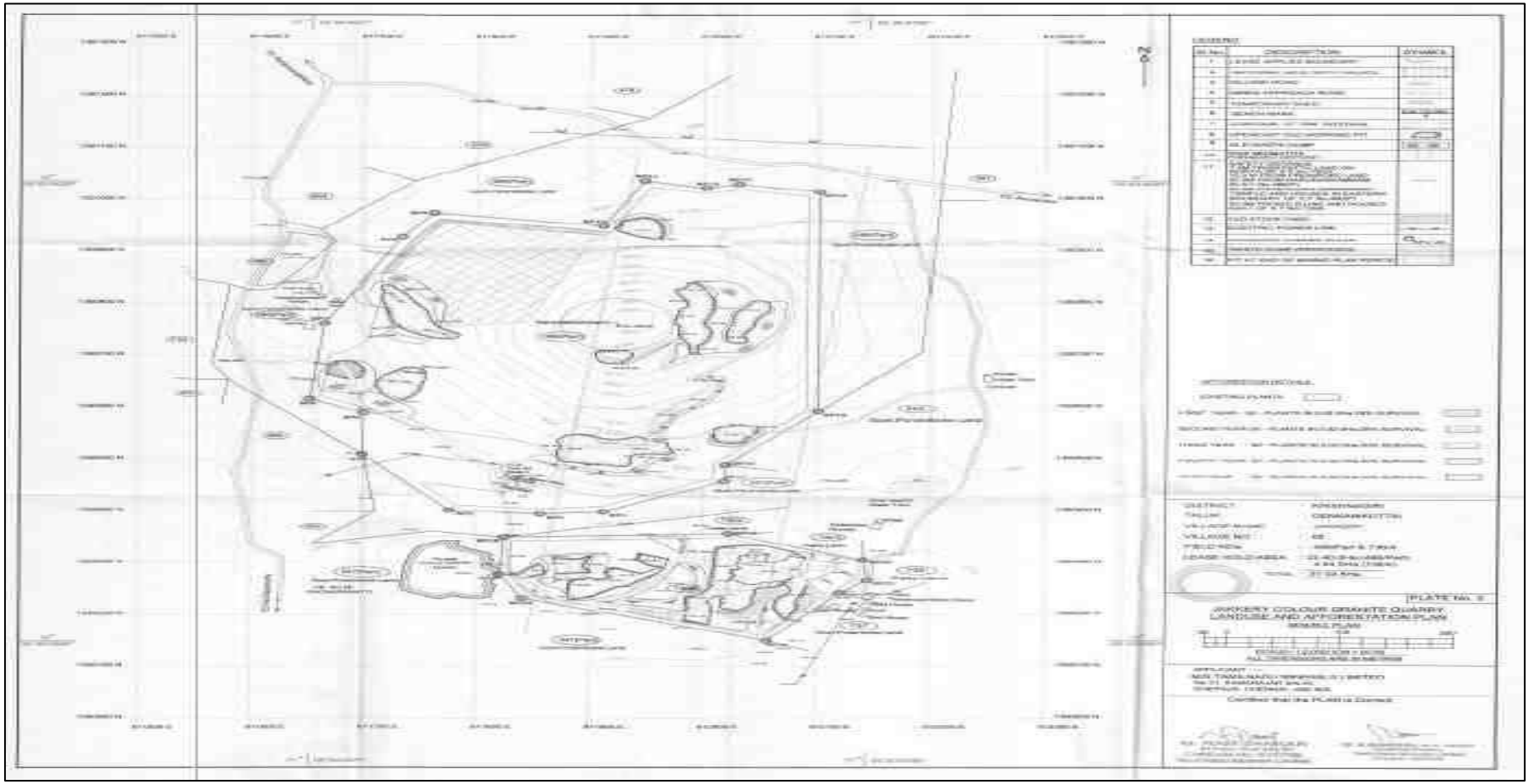

Figure 2-17 Land use and Afforestation Plan

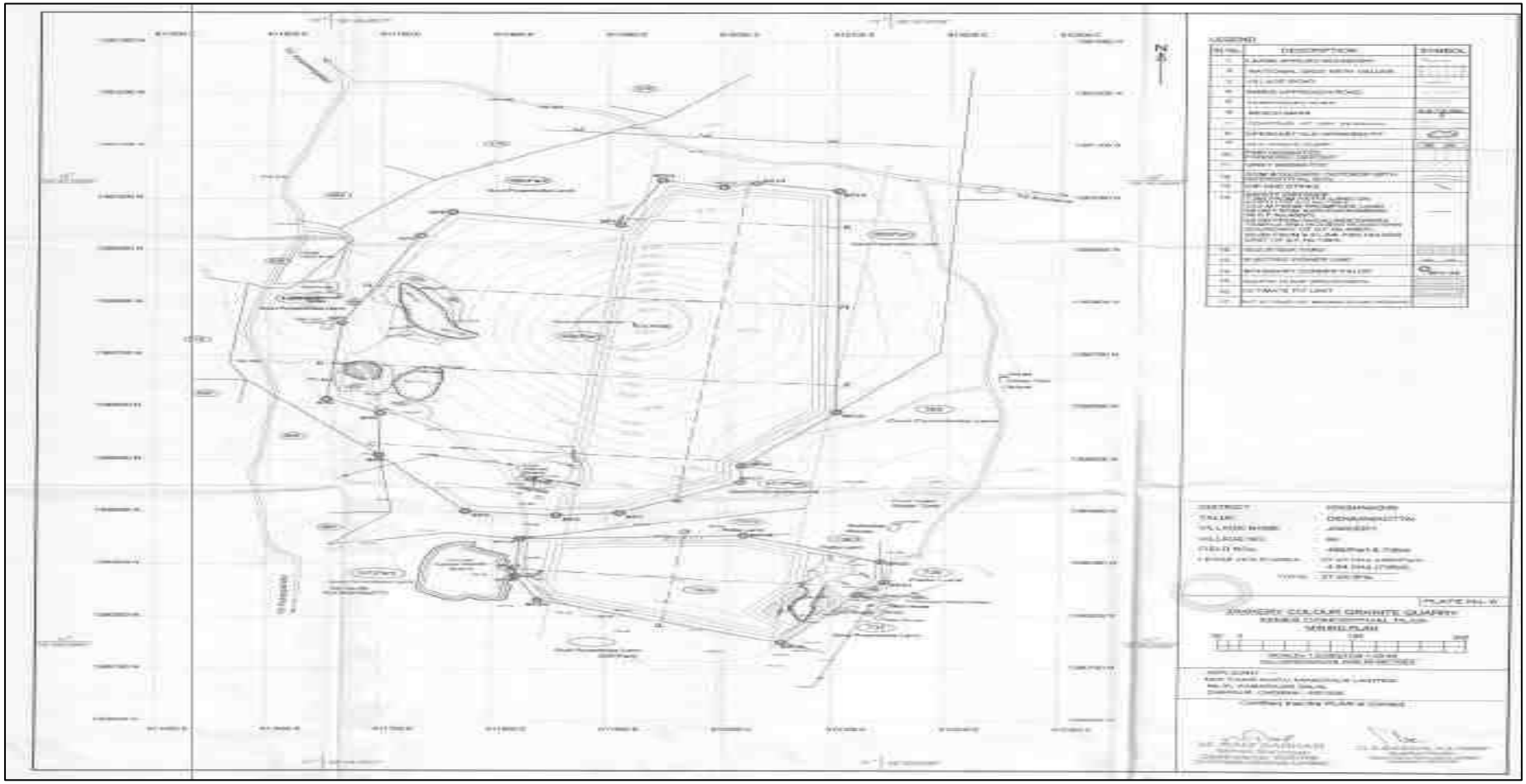

Figure 2-18 Mine Conceptual Plan

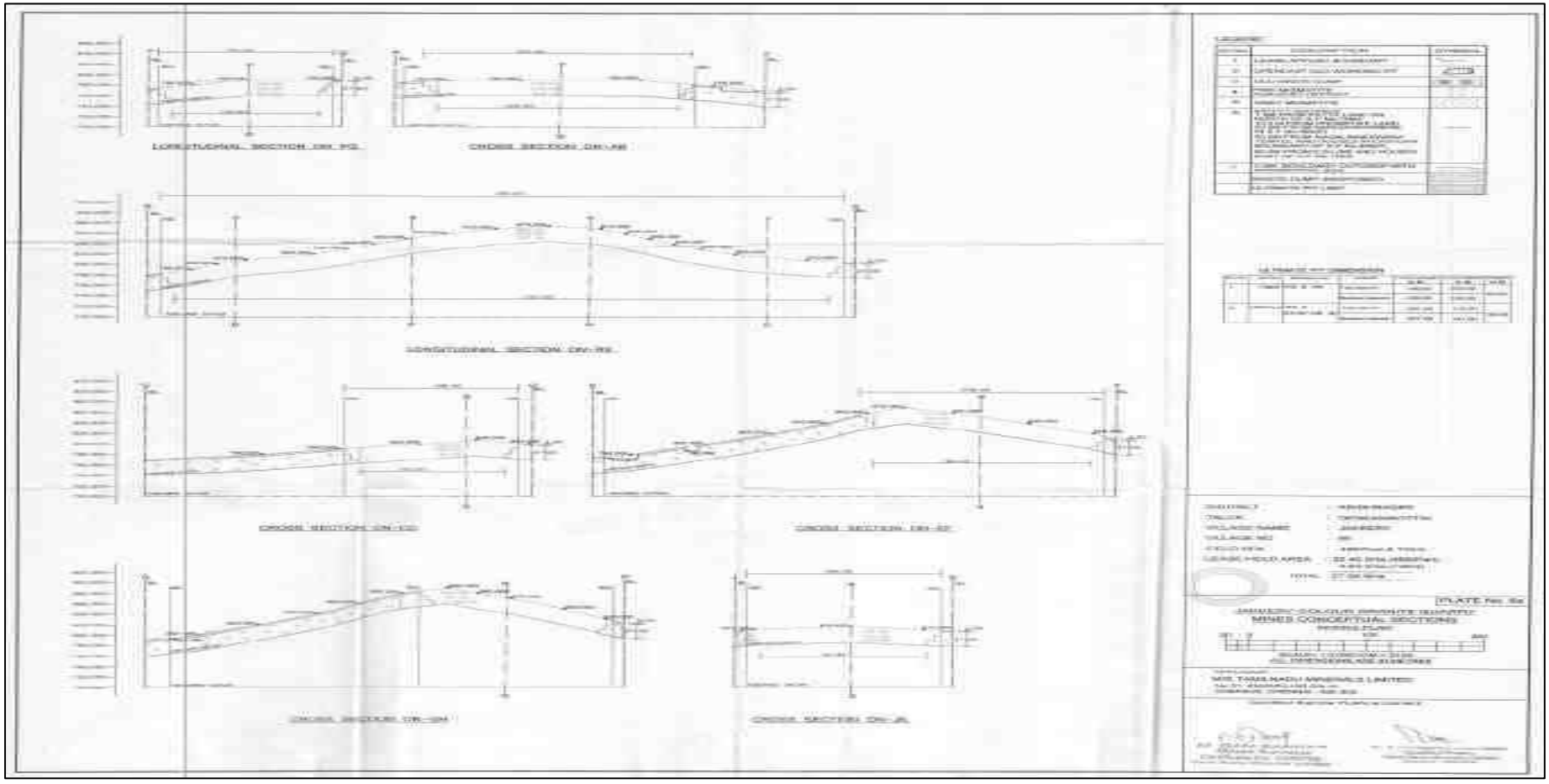

Figure 2-19 Mine Conceptual Section

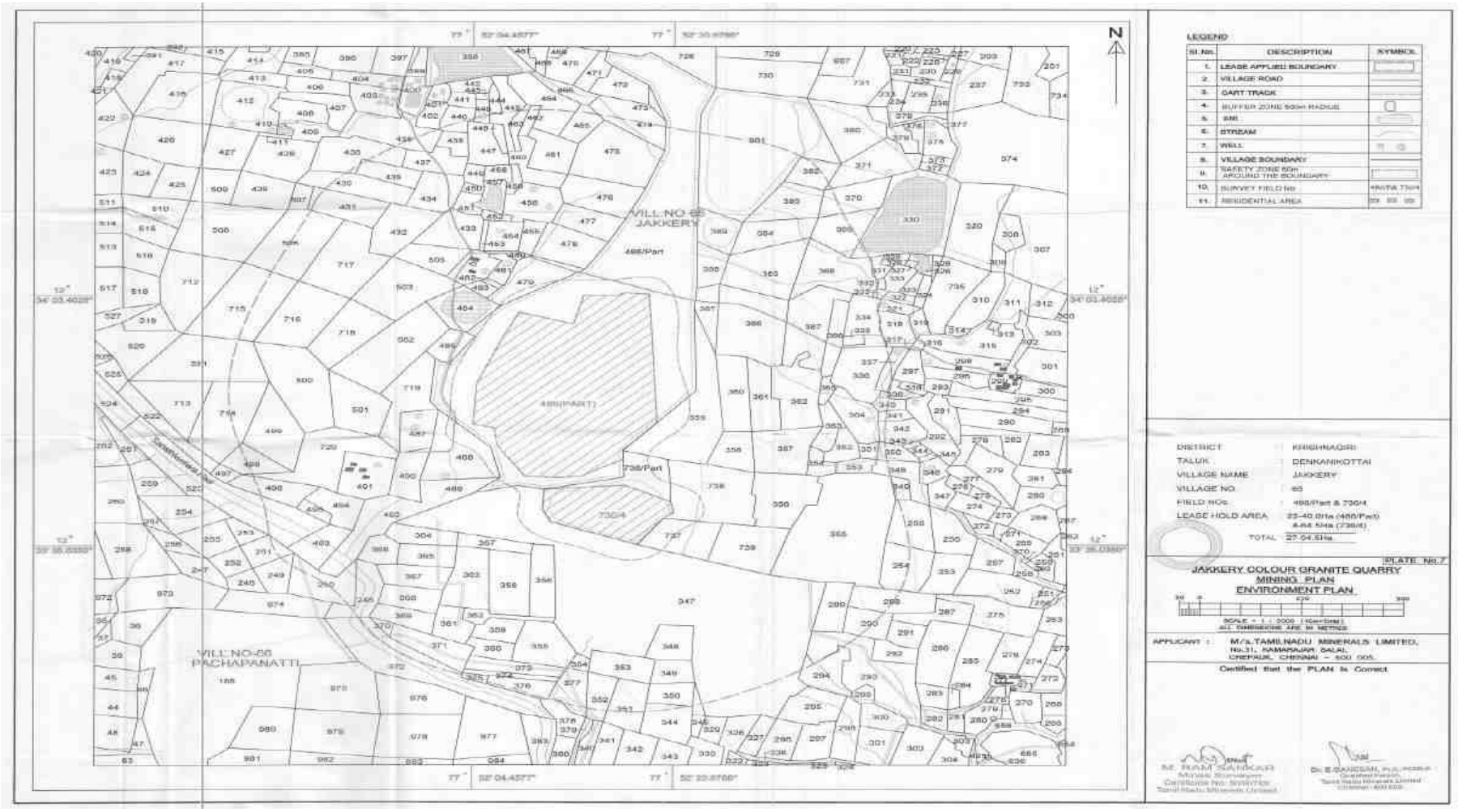

Figure 2-20 Environment Plan

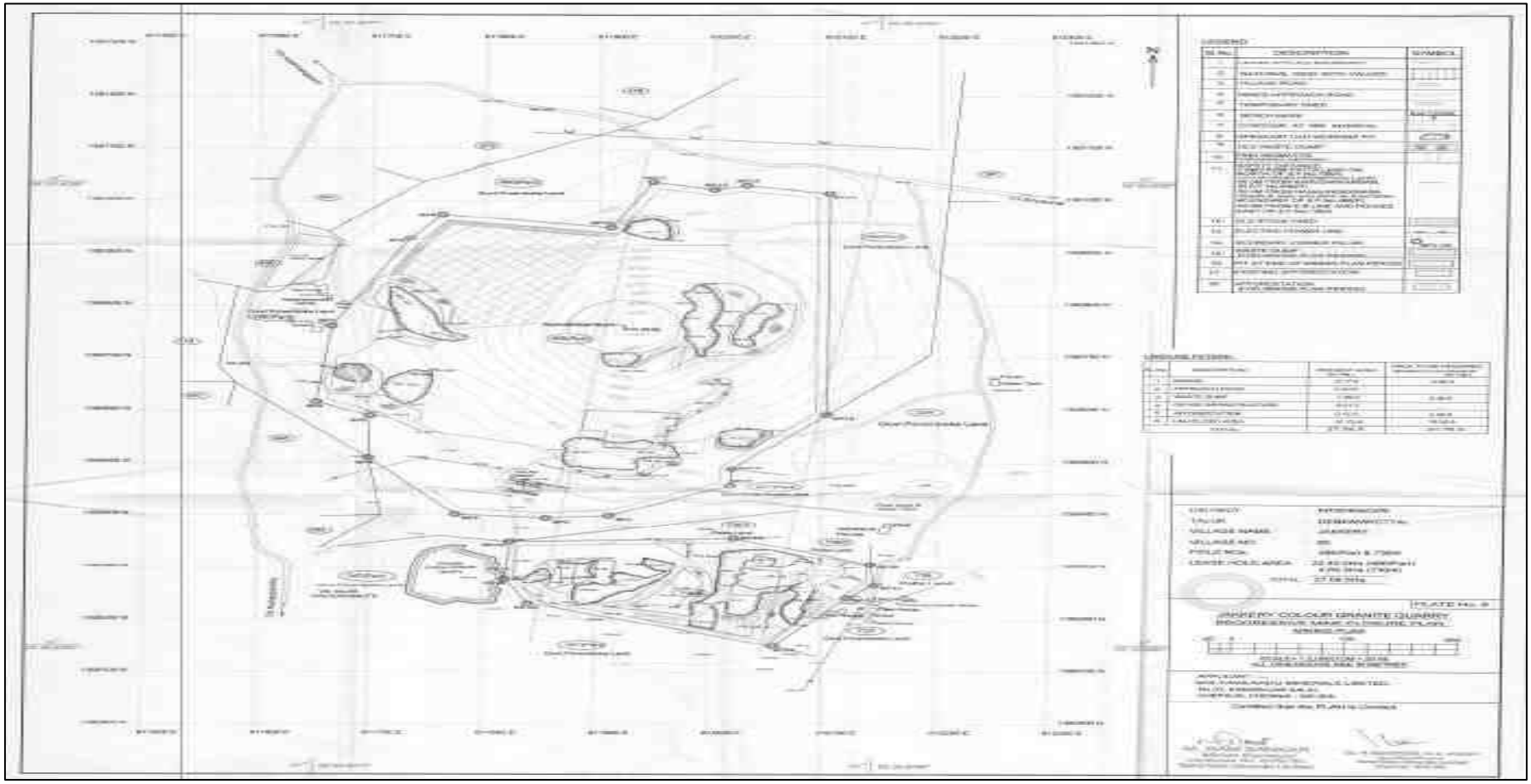

Figure 2-21 Progressive Quarry Closure Plan

2.8 Project Cost

The project cost is summarized in **Table 2-13.**

Table 2-13 Project cost

S. No	Description of the Cost	Amount in Rs.
A. Fixed Cost		
1	Land Cost	Nil. Because Govt. land
2	Labour shed	50,000/-
3	Sanitary facilities	50,000/-
4	Fencing Cost	1,25,000/-
Total		**2,25,000/-**
B. Operational Cost		
1	Jack Hammers	1,98,000/-
2	Compressor	19,82,000/-
3	Diamond wire saw	4,87,000/-
4	Diesel General	4,00,000/-
5	Excavators	6,00,000/-
6	Tippers	58,00,000/-
7	Drinking water facilities for the labours	50,000/-
8	Safety kits	50,000/-
Total Operational Cost		**95,67,000/-**
C. EMP Cost		
1	Afforestation	30,000/-
2	Water Sprinkling	50,000/-
3	Water Quality test	25,000/-
4	Air Quality test	25,000/-
5	Noise/Vibration test	25,000/-
6	CSR activities	50,000/-
Total EMP Cost		2,05,000/-
Total Cost of the Project (A+B+C)		**99,97,000/-**

2.9 Technology & Process Description

2.9.1 Technology

The primary step of mining of minerals is the removal of the deposits from the ground. Once the minerals / ore are removed, an additional preparation process is required to isolate the valuable minerals from their waste gangue minerals. There are two basic methods of mining of minerals opencast and underground mining. The choice of method depends on the geologic, hydrological, geo-technical, geographic, economic, technological, environmental, safety, Socio - political and financial considerations. Schematic Diagram of Mining Process is given in **Figure 2-22.**

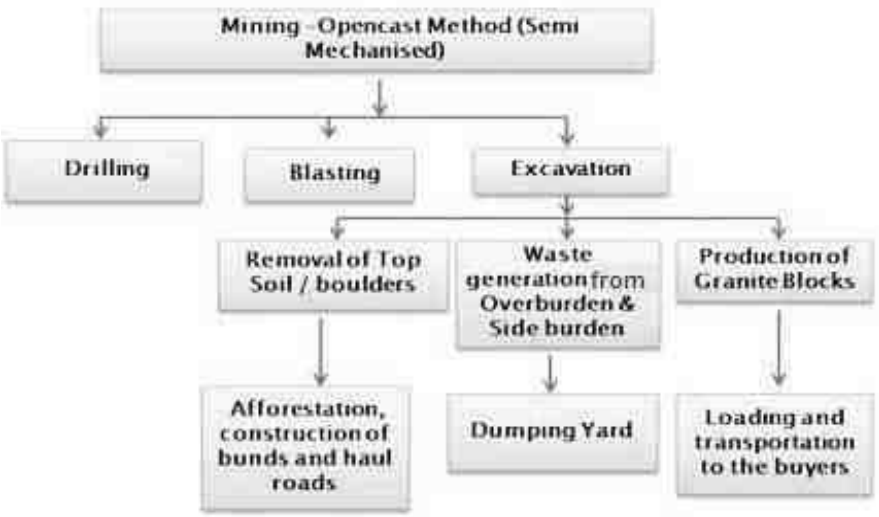

Figure 2-22 SchematicDiagramofMiningProcess

2.9.1.1 Method of mining-Open Cast Working

In accordance with the Regulation 106(2) (a) of the Metalliferous Mines Regulations 1961, in all open cast workings where the ore body forms hard rock, the working faces and sides should be adequately benched and sloped; A bench height not exceeding 6m and a bench width not less than the height must be maintained. The slope angle of such benches and sides should not exceed 60° from horizontal.

However, observance of these statutory provisions into in granite dimensional stone mining is seldom possible due to the field difficulties and technical reasons as given below:

1) Recovery of the granite mineral should be as undamaged rectangular dimensional blocks. In the attempt to form the benches and sides with the above statutory parameters haphazard blasting may be involved. In which case, the commercial granite body may get damaged due to generation of blasting cracks.

2) In the exercise of forming the benches with 60° slope within the granite deposit, the portion confined between vertical and 60° as well as its complimentary part in the extricated block will become mineral waste while shaping into rectangular blocks.

3) The granite industry needs blocks as huge as a few cubic meters in volume with measurements up to 3mx2mx2m. Production of such huge blocks with a moving bench of 6m height is not possible. Productions of such huge blocks in turn increase the recovery and reduce the mineral waste during dressing. Blocks of smaller size of certain varieties of granite are not marketable now-a-days.

4) Formation of too many benches with less height and the width equal to the height may lead to large volume of mineral locked up.

Hence to avoid mineral locked-up and to facilitate economical and convenient mining operations, it is proposed to obtain relaxation to the provisions of Regulation 106(2) (a) up to a bench parameter of 6m height and 6m width with vertical faces. Such a provision for relaxation of the Regulation has been provided within regulation 106(2). Further, it is to be noteworthy that opencast granite mining operations with the above proposed bench parameters may not be detrimental to Mines Safety, since the entire terrain is made up of hard rock, compact sheet and possess high stability on slope even at higher vertical angles.

It is proposed not to back fill the pit in as much as good quantities of reserves are underlining the pits. The stock yard for the granite blocks produced and the dressing yard where the manual dressing and shaping of the blocks are carried out are located near the working pit to minimize the lead from the pit to the dressing yard and stock yard. A mine office, storeroom, first-aid room and workers rest shelter will be provided within the lease area where mining is not proposed due to technical reasons and quality consideration.

2.10 Process Description

2.10.1 Mining

An open cast semi mechanized mining with a 6m vertical bench with a bench width of 6m has been proposed. The safety distance of 7.5m inner boundary of all along the boundaries of the lease area as well as the distance of 10m from the adjacent Government lands and Village Road and the distance of 50m from the Tar Road and well will be provided and maintained during the entire period of lease.

Under regulation 106(2) (a) of the Metalliferous Mines Regulations, 1961, in all open cast workings in hard ore body, the benches and sides should be properly benched and sloped. The bench height should not exceed 6m and the bench width should not be less than the bench height. The slope of the benches should not exceed 60° from horizontal.

As far as the mining of granite dimensional stones is concerned, observance of the provisions of the Regulation 106(2) (a) as above is seldom possible due to various inherent petrogenetic and mining difficulties.

Hence it is proposed to obtain relaxation to the provisions of the above regulation from the Chief Inspector of Mines, for which necessary provision is available within Regulation 106 (2) (a).

The production of Colour granite dimensional stone in this mine involves the following methods typical for granite stone mining, in contrast to any other major mineral mining.

1) Splitting of rock mass of considerable volume from the parent sheet rock carefully avoiding any kind of damage in the form of cracks adopting the following methods:

    a) Diamond wire cutting along the horizontal as well as two parallel to strike and dip direction and the third vertical face will be a free liberated by conventional serial blasting.
    b) Separation of the horizontal (bottom) and the vertical (length side) planes by serial blasting simultaneously along the above two planes by using 32mm dia. blast holes charged with mild explosive like gun powder or detonating. The process continued aiming at the liberation of huge volume of the granite body from the parent sheet rock is called 'Primary Cutting'.
2) The 'Secondary Splitting' into required size involves long hole drilling up to the bottom of the separated block along the required planes for which mostly rock breaking powder or expansion mortar is used for splitting. It is chemically called 'Calcium Hydroxide' $Ca(OH)_2$.
3) Removing the defective portions and dressing into the useful dimensional blocks are done manually using feather and wedges and chiseling respectively by the labourers who are skilled in this work.

The defect free rectangular shaped dimensional stones as acceptable consumers are produced by the method described above, which is constantly supervised by experienced Mining Geologist and Mining Engineer.

The waste materials generated during mining activity includes the rock fragments of different angularity formed during the removal of naturally defective and uneconomical portions of the deposits and the working waste formed during dressing of the extricated blocks. During the first five years of the Mining Plan period such waste materials are proposed to be dumped along the South side of the lease area where it comprises of country rock terrain.

2.10.2 Blasting

The blasting parameters in the mining of Granite dimensional stone are entirely different from that of industrial minerals since the basic purpose for the use of explosives in both the cases are entirely different. In industrial minerals, maximum fragmentation and crushing of the ore is essential, whereas in granite mining, the granite stones are to be extricated intact, without any damage to both the extricated part and the parent rock body.

The portion to be extricated from the parent rock body is freed in all planes by adopting different methods. Only mild explosives such as gun powder, detonating cord, ordinary detonators etc. will be used to produce granite blocks. The blast holes of 32mm dia. are

drilled up to the bottom of the horizontal plane all along the required vertical planes without deviation.

Conventional 32mm dia. blast holes are drilled perfectly parallel to each other at 20 to 25cm intervals without any hole deviations, all along the required plane of splitting. The holes are drilled up to a depth a few cm above the required horizontal plane. Sub-grade drilling is not necessary since the splitting will be affected up to a further distance of few cm from the drill hole on blasting. Since the splitting will be affected up to a further distance a few cm from the drill hole on blasting. Such sub grade drilling may affect the underlying granite deposit.

Heavy, explosives such as gelatin, delay detonators etc. may also be used occasionally at places further away from the granite deposit for certain development works such as forming approach roads to the working faces below ground level, for forming flat surfaces to be used as dumping yard etc. The explosives required for production and development of the Colour granite will be purchased from the authorized explosives dealer who has got a valid license to undertake blasting work to contract basis under License LE3 as Explosive Rules 2008. The blasting will be carried out under the direct supervision of our Statutory Mining Personal of TAMIN as approved by the DGMS under MMR, 1961.

The secondary splitting into required size involves long hole drilling up to the bottom of the separated block along the required planes for which mostly rock breaking powder is used for splitting. It is chemically called 'Calcium Hydroxide Ca $(OH)_2$.

Now-a- days the splitting within the sheet rock is affected by Diamond wire sawing, which largely reduces the use of explosives in granite mining. Many adverse effects of blasting are avoided and hence the recovery will be substantially increased by Diamond wire cutting. Hence, it is proposed to deploy one Diamond wire saw machine in this mine.

2.10.3 Loading & Transportation

The mode of transport of the granite blocks produced and marketed is by road to various consumer destinations and granite processing units located in different parts of the country. The blocks approved for export market are shipped through Chennai Harbor to various countries.

2.10.4 Exploration

Several valuable data for economical mining of the granite stone in this area have been known.

a) Occurrence of the Granite stone in economically viable quality and quantity has been established by geological mapping and visual examination by Mining Geologists experienced in granite mining which have been proved by actual mining practice.

b) The depth persistence of the granite stone is proved beyond the workable limits of 30 m from the petrogenetic character of the granite body as well as from the actual mining practice. Considering the deposit with sheet rock formation of 30m depth persistence from the surface level has been taken as 'economically workable' depth to include all the three categories of mineral reserves viz, proved, probable and possible reserves.

c) The recovery of the saleable granite stones has been established as 25% from the visual exploration and from the data available by actual mining practices during the past mining in TAMIN's nearby lease area.

d) If any drilling program is carried out in the granite formations, there are defects like cracks and fractures that will be generated and developed during drilling time. Hence, having established all the data necessary for economic exploitation in this area, no definite program for future exploration has been drawn up. The mining activities during the first five years with deep cuts may render additional data as may be required for future planning.

2.10.5 Storage of Explosives

The applicant will engage an authorized explosive agency to carry out the small amount of blasting as such no storage of explosives is envisaged for this proposal. The blasting will be supervised by DGMS authorized. Mines Foreman/Mines Manager certificate of competency.

2.10.6 Mine Drainage

The mine area is an elevated ground with gentle slope on both sides of the linear dyke. Hence there is a natural drainage system facilitating easy and comfortable drainage ofrain waters. However, as a precaution, catch drains has been formed all around theworking pit and it has been led to the natural drainage, so that the rainwater will not enterthe working areas.

2.10.7 Disposal of Waste

The waste generated during the mining operation is a side burden, granite rejects and the non-recoverable / un-sized boulders and rubbles etc and their accommodation are easier. The area for disposal of waste rock will be identified in South side of the lease area. The unsold blocks are kept within the boundary on the country rock area.

Total waste to be generated during the five years of Mining Plan period will be 31,204 m^3. The waste material will be dumped on western side of SF. No. 486(Part) of the lease applied boundary. The dumps will be maintained not exceeding 5m height and the angle of slope of dumps will be at 45° from horizontal.

2.10.8 Topsoil Management

Topsoil will be properly stacked at earmarked dump site with adequate measures. It will be used for growing plants along the fringes of the site roads and reclamation of external dump

and backfilled area. The topsoil stockpiles will be low height and will be grassed to retain fertility. Besides these topsoil stacks there will be temporary stacks near the excavation area and area to be reclaimed which will be made use of for concurrent lying without bringing the topsoil to the soil stack near the OB dump.

2.10.9 Stabilization of Dump

Total waste to be generated during the five years of Mining Plan period will be 31,204 m^3. The waste material will be dumped on the western side of SF. No. 486(Part) of the lease applied boundary. The dumps will be maintained not exceeding 5m height and the angle of slope of dumps will be at 45° from horizontal.

As the waste generation in the mine includes hard rock fragments of considerable size and irregular shape with varying angularity, the waste dump will be stable on its own even at higher slopes of the sides. However suitable variety of soil will be brought from outside, the same is spread out over and sides of the waste dumps and for tree sapling will be carried out for increasing the stability and to prevent erosion during the rainy season.

2.11 Requirements

2.11.1 Land Requirement and Land Use Planning

Quarry Land details are shown in **Table 2-14** and Land use pattern is provided in **Table 2-15.**

Table 2-14 Quarry Land details

District and State	Taluk	Village	S.F. No	Area (Ha)	Land Classification
Krishnagiri District, Tamil Nadu State	Denkanikottai	Jakkery	486(Part) & 736/4	27.04.5	Government Land

Table 2-15 Land Use Pattern of the lease area

S. No	Description	Present Area (Ha)	Area to be Required Mining Plan Period (Ha)
1	Mining	2.77.0	0.80.0
2	Approach Road	0.40.0	-
3	Waste Dump	1.99.0	2.36.0
4	Office Infrastructure	0.01.5	-
5	Afforestation	0.12.0	0.06.5
6	Unutilized Area	21.75.0	18.52.5
Total		**27.04.5**	**21.75.0**

2.11.2 Water Requirement

The total water requirement is 3.5 KLD. The total water requirement will be met from authorised vendors orlocal panchayat. The granite quarry will not produce toxic effluent in the form of solid, liquid or gas. No wastewater will be generated by quarry operation except domestic sewage. Domestic sewage will be disposed to septic tank followed by soak pit.

Septic tank will be cleaned periodically. The water requirement details aregiven in**Table 2-16.**

Table 2-16Water requirement breakup

S. No	Description	Water Requirement (KLD)
1	Drinking &Domestic purpose	0.7
2	Wire Saw Cutting	0.3
3	Dust suppression	1.5
4	Green Belt	1.0
Total		**3.5**

2.11.3 Power & Fuel Requirement

The Power and Fuel requirement details are given in **Table 2-17.**

Table 2-17 Power Requirements

S. No	Description	Power Required
1	Power requirement (kVA)	60
2	Power Backup (DG set)	1*125 kVA
3	Fuel requirements (Lts/Day)	200

2.11.4 List of Equipment

The list of Equipment is given in **Table 2-18.**

Table 2-18 ListsofMachineries

S. No	Purpose	Machinery	Numbers	Capacity	Make	Motive Power
1	Drilling	Jack Hammer (32mm dia)	6	1.2 to 6 m	Atlas Copco	Compressed Air
		Compressor	2	400 psi	Atlas Copco	Diesel Drive
		Tractor Mounted Air Compressor	1	-	-	Diesel Drive
		Diamond Wire Saw	1	30 m^3/day	Optima	Diesel Generator
		DG	1	125 KVA	Powerica	Diesel
2	Loading	Excavator	1	3000 LC	TATA Hitachi	Diesel Drive
3	Transport	Dumpers	2	25 Tons	Ashok Leyland	Diesel Drive

2.11.5 Manpower Requirement

Table 2-19 Manpower Details

S.No	Description	Noof Persons
Direct Manpower		
1	Manager (Second Class Manager certificate of competency Restricted)	1
2	Mine Foreman (Foreman Certificate of competency Restricted)	1
3	Operators & Drivers	7
4	Workers (Skilled, semiskilled & unskilled)	27

	Total	**30**
Indirect Manpower		**20**

2.11.6 Solid Waste Management

The municipal solid waste generation and management details are given in **Table 2-20.**

Table 2-20 Municipal Solid Waste generation & Management

S. No	Type	Quantity Kg/day	Disposal method
1	Organic	5.4	Municipal bin including food waste
2	Inorganic	8.1	TNPCB authorized recyclers
Total		**13.5**	

As per CPHEEO guidelines: MSW per capita/day=0.45

2.11.7 Hazardous waste Management

The type of hazardous waste and the quantity generated are detailed in **Table 2-21.**

Table 2-21 Hazardous Waste Management

Waste Category No	Description	Quantity (L/Year)	Mode of Disposal
5.1	Waste Oil	0.1	Will be Collected in leak proof containers and disposed to TNPCB Authorized Agencies for Reprocessing/Recycling

2.12 Infrastructure facilities

Mine office, storeroom, first-aid room etc, will be provided on semi- permanent structure within the lease area.

2.13 Resource optimization/recycling and reuse envisaged in the project.

No optimization/recycling and reuse envisaged in the colour granite quarry.

2.14 Availability of water its source, Energy/power requirement and source

This quarry project does not require huge water and quarry operation will be carried out during the general shift only. Limited Scale of activities entails only the negligible power requirement and the same is met from TNEB or from solar light.

2.15 Schematic Representations of the Feasibility Drawing which Give Information Important for EIA Purpose

A schematic representation of the overall feasibility and environmental assessment process is shown in**Figure 2-23.** The EIA process is composed of the following stages:

- Study of project information

- Screening & Scoping
- Environmental Pre-Feasibility study & application for approval of TOR
- Collection of detailed project management plan/report
- Baseline data collection
- Impact identification, Prediction & Evaluation
- Mitigation measures & delineation of EMP
- Risk Assessment and Safety & Disaster Management plan
- Review & finalization of EIA report based on the TOR requirements.
- Submission of EIA report for implementation of mitigation measures & EMP as well asnecessary clearances from relevant Authority.

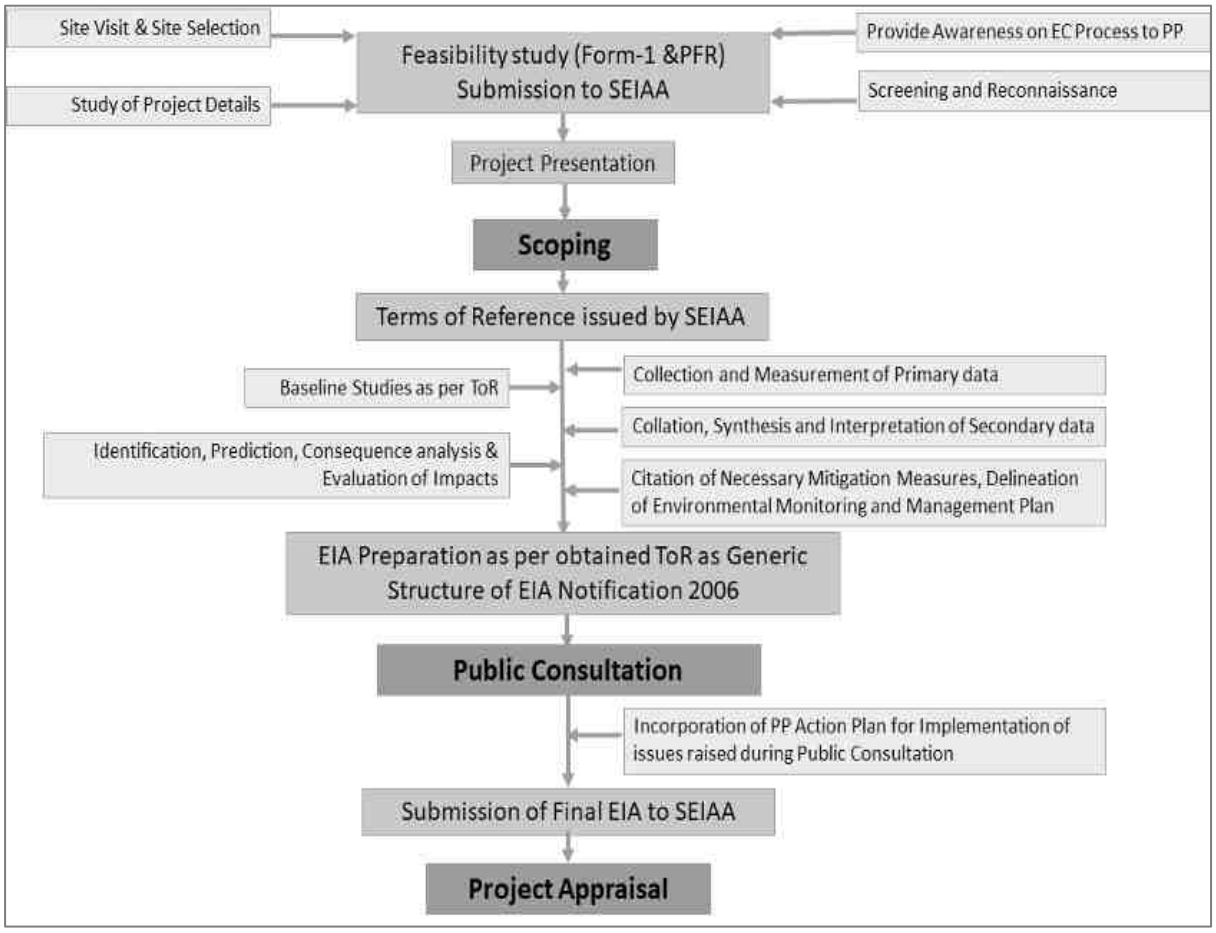

Figure 2-23 Feasibility & Environmental Assessment Process

2.16 Description of Mitigation Measures Incorporated into the Project to Meet the Environmental Standards

From an environmental perspective, this phase is of paramount significance due to its potential to invoke long-term impacts. The adverse effects that are likely to occur during

operational phase of the project are: Air Pollution (gaseous emissions), Effluent/Sewage generation, Noise generation, Solid waste generation etc.

2.16.1 Land Environment

The land use of the existing area is already for mining purpose. Hence there will be no change in land use pattern.

2.16.1.1 Discharges on Land-Impact

Domestic:

Domestic wastewater is being disposed into septic tank followed by soak pit.

Mitigation Measures

- The mine waste in the mine includes the topsoil/rockfragments and rubble generated as mineral rejects during production works and the country rock fragments generated during development works as approach road formation or dumping yard sites etc.
- The dumps may also be a source of air pollution due to wind erosion if they are not properly rehabilitated. Topsoil and overburden will be generated from the mining project which will be stacked separately at the designated areas.

2.16.1.2 Impacts- Soil Contamination

Potential impacts on land environment are envisaged due to hazardous and non- hazardous wastes generated due to various operations in the project site like municipal waste from domestic use and waste diesel oil from quarry machineries. Poor management of such materials/wastes from the operations is a potential risk of soil contamination.

Mitigation Measures

Good housekeeping and best practices of waste handling shall be adopted to eliminate/minimize the risks of soil contamination. The wastes generated will be stored in temporary storage facility and transferred to nearby municipal disposal bins. Waste oil is being generated from quarry machineries and the same is disposed through TNPCB Authorized dealers.

2.16.2 Air Environment

Mining operations contribute towards air pollution in two ways: addition of gaseous pollutants to the atmosphere and the dust particles. The gaseous pollutants include NOx, SO_2 and Hydrocarbons. The sources of pollutants from the mining activity include:

- Operation of Heavy Earth Moving Machinery (HEMM)whichmostlyrunondiesel.
- Loading/unloadingoperations.

- Transportation of mineral/overburden in dumpers
- Drilling and Blasting operations.

2.16.3 Sources of Air Pollution

2.16.3.1 Point Source/Single Source

These are stationary sources, which emit air pollutants into the atmosphere from a certain fixed point. In the existing quarry, the following sources, or activities from the point sources, which emit Suspended Particulate Matter (SPM).

2.16.3.2 Drilling

Drilling is an important activity of mining process. The secondary splitting in to required size involves drilling up to the bottom of the separated block. Air pollution in the form of SPM is envisaged from this activity.

Conventional 32mm dia blast holes are drilled perfectly parallel to each other at 20 to 25cm intervals without any hole deviations, all along the required plane of splitting. The holes are drilled up to depth few cm above the required horizontal planes. Sub grading drilling is not followed since the splitting will be affected up to a further distance of cm from the drill hole, because sub grade drilling may affect the underlaying granite deposit.

2.16.3.3 Loading

In the proposed project, the loading of side burden and granite rejects is proposed by Hydraulic excavators. This activity is likely to contribute air pollution in the form of SPM (dust) during discharge of material from bucket and gaseous pollutants like SO_2, NOx and Hydrocarbons due to combustion of fuel (diesel) in the loading machinery.

2.16.3.4 Unloading

The generated rejects and granite at mine face will be transported by dumpers and unloaded at the designated locations. During unloading operation of both the material, air pollution in the form of SPM (dust) is envisaged due to discharge of material from the dumper and gaseous pollutants like SO_2, NOx and Hydrocarbons due to consumption of fuel (diesel) by dumper while unloading the material.

2.16.3.5 LineSources

These are normally mobile sources, which emit atmospheric pollutants in the area through which they pass.

2.16.3.6 Transportation

The generated rejects and granite from site will be transported by haul road. Transportation also includes movement of service vehicles in the mine lease area. The traffic on the haul roads is likely to contribute towards an increase in dust and gaseous pollutants concentration

in the area. However, this is more of a localized phenomenon within the mining areas that have limited human exposure.

2.16.3.7 Area Sources/Multiple Sources

These constitute pollution from various sources and activities situated in the mine lease area. The total mine area with all its mining activities constitutes the area source. These include all the mining activities, operations of equipment/machinery (HEMM), wind erosion from active mine pits, and waste dump locations and haul road which contribute to the atmospheric pollution from the various units/activities.

2.16.3.8 Instantaneous Sources

The instantaneous sources consist of air pollution due to sudden/instantaneous activities like blasting in the mine area. The blasting process involves dislodgement of big blocks of hard strata/mineral from the mines. This operation generates maximum dust, which results in the increase of SPM concentration. It also contributes to emissions of certain gases (Oxides of Nitrogen and Ammonia) due to the use of explosives.

The size of the dust particles emitted into the atmosphere plays a major role in deciding the distance to which they may be transported. Particles of larger size fall rapidly and closer to their source, because of gravitational settling. However, the aerosols, because of their small size may be held in suspension for years in the atmosphere and may be transported on a global scale. Eventually, these smaller particles are collected in raindrops and fall on earth. The composition of these particles largely depends on the composition of the mineral being processed.

Mitigation Measures

- The increment in the fugitive emissions will be mainly due to transportation activity. Therefore, emissions due to mineral handling during mining operation are not much and restricted to the lease area only.
- Proper mitigation measures are practiced during mining activities to control air pollution load below the prescribed limits are as follows:
- Watering of haul roads and other roads at regular intervals
- Spraying of water on permanent transport roads at required frequencies.
- Provision of dust filters / mask to workers working at highly dust prone and affected areas.
- Provisionofgreenbeltbyvegetationfortrappingdust.
- Greenbelt development along the haul roads, dumps and along the boundaries of the lease area.
- The utmost carewillbetakentopreventspillageof sandandstonefromthetrucks.
- Coveredtarpaulinfortransportofmaterials.

2.16.4 Noise & Vibration Environment

The sound pressure level generated by noise source decreases with increasing distance from the source due to wave divergence. Themain sources of noise in the mine are as follows:

- Drilling and Blasting
- Excavation of the material
- Loading & unloading of minerals
- Transportation vehicles

2.16.4.1 Noise Levels

Heavy Earth Moving Machineries (HEMM) is deployed in mining operations. The noise levels of the major equipment are in the range of 88 to 90 dB (A). The noise levels are localized within the mining areas. Occupational hazard is envisaged if proper personal protective equipment is not provided to the operator and workers.

2.16.4.2 Vibration

The vibration due to blasting can cause damage to the nearby structures if appropriate technology and control measures are not adopted in the blasting operation. Fly rock is another possible damage causing outcome of blasting. There are many factors which influence fly rock during blasting. Most important of these factors are long explosive columns with little stemming column, improper burden, loose material or pebbles near the holes and long water column in the hole.

TAMIN will be followed shallow holes of 32mm dia are drilled and conventional low explosives such as gun powder, ordinary detonators etc are used for the splitting of hard rock mass. Hence, ground vibration and noise pollution will be minimal and restricted to within the mine workings. The blasting will be taken up at appointed times only and with sufficient caution to the public. By adopting controlled blasting, the problems will be greatly minimized, and the impacts will also be minimized by choosing proper detonating system, optimizing total charge and charge/delay.

Ground vibration, flying rock, air blast, noise, dust, and fumes are the deleterious effects of blasting on environment. The explosive energy sets up a seismic wave in the ground, whichcan cause significant damage to structures and disturbance to human occupants. Theimpact will be minimized by choosing proper detonating system and optimizing total chargeand charge/delay and by regular monitoring of magnitude of ground vibrations and air blast.

Impact

A noise generation source during operation phase is classified into two categories:

- Stationary sources due to operation of heavy-duty machinery at the project site like Compressors, DG sets, Quarry vehicles and drilling machineries etc.

Mitigation Measures

- The major noise generating equipment like Compressors, DG sets, Excavator, & Tippers etc, will be enclosed in an acoustic enclosure designed for an insertion loss of 25 dB (A) and silencers to other equipment etc.
- Drilling will be carried out with the help of sharp drill bits which will help in reducing noise.
- Secondary blasting will be totally avoided.
- Controlled blasting with proper spacing, burden, stemming and optimum charge/delay will be maintained.
- The blasting will be carried out during favorable atmospheric condition and less human activity timings i.e. during lunch interval or during change of shifts.
- Proper maintenance, oiling and greasing of machines at regular intervals will be done to reduce the generation of noise.
- Greenbelt and plantation will be developed around the mining activity area and long-haul roads. The plantation minimizes propagation of noise.
- Periodical monitoring of noise will be done.
- The occupational noise exposure to the workers in the form of eight hourly times weighted average will be maintained well within the prescribed Occupational Safety and Health Administration (OSHA) standard limits.
- Adequate PPE will be provided for the staff exposed to noise risks.
- Acoustic silencers will be provided in equipment wherever necessary.
- Use of personal protective Equipment's/devices such as earmuffs, ear plugs etc. will be strictly enforced for the workers engaged in high noise areas.
- Periodic maintenance of the equipment to be used in the developmental works will be carried out. Worn out parts will be replaced, and rotating parts will be lubricated to minimize noise emissions.
- Implementation of greenbelt for noise attenuation will be undertaken.
- Ambient noise levels will be monitored at regular intervals during the operational phase of the project.
- Low vibration generating machines/equipment will be selected to meet international standards and foundations will be designed to minimize vibrations and secure properly.
- Vibration generating sources and their platforms should be maintained properly to minimize vibrations and related impacts.
- Vibration dampers will be provided around the source of generation.

- Transportation Management Plan will be prepared, and the transportation of materials will be planned in line with the same.

2.16.5 Water Environment

Impact on Existing Water Resources

The total water requirement for a quarry is 3.5 KLD. The total water requirement is met from authorized vendors and local Panchayat; Domestic sewage is being disposed into Septic tank & no toxic/other effluent generation. Hence the impact due to the project is very minimal.

2.16.5.1 Impacts on Surface Water Bodies

The surface water and groundwater are the lifeline of the villages. All the ponds in the area are working as recharge sites for the under lying groundwater and hence the surface water and ground water systems are acting like a single unit and therefore cannot be seen in Isolation.

Any contamination in surface drainage due to operation of project could collapse the system and will have serious impacts to the water resources especially the availability of potable water in the PIA area. The impacts will be high in the core area, especially the 10 km radius area. Therefore, it is apparent thatthere will is negligible impact of mining on the surface water regime.

2.16.5.2 Impact on Ground Water

There will not be any ground water withdrawal, as the total water requirement is being met by private tank waters. As, the mine lease area is a Hilly area. Site elevated at 794to817 m height from the ground level. Hence, there will not be any ground water levelintersect as the planned depth of mining is 30 m from the top of the hill.

Mitigation Measures

The following measures are proposed as a part of development to improve the ground water scenario and to ensure that ground water is not contaminated. Strategic plans such as implementing the following structures for rainwater harvesting and groundwater recharging purposes in project site will be adhered.

- Rainwater storage ponds/tanks
- Storage cum recharge ponds
- Monitoring of water quality and groundwater level variations in the project site.

2.16.6 Biological Environment

Impact on migratory paths for wildlife and forest blocks

There are no identified migratory paths for major and minor wildlife in the project site and the study area. The identified fauna which are observed at the project site and in the study,

area are local migrants only. Therefore, the proposed project operations are not likely to have any adverse impact on the paths for avid fauna.

Mitigation Measures

- Discharge of waste into the water bodies during the quarry operation phase would not be allowed.
- Awareness will be given to workers about the importance and conservation of terrestrial ecology and biodiversity.

2.16.7 Solid Waste Management

2.16.7.1 Impact due to Solid Waste Generation

During quarry operations, Municipal solid waste and waste oil are likely to be generated which can be broadly categorized as Hazardous Waste and Non-hazardous Waste. Further, the generated solid waste generation may include Biodegradable, Recyclable and Inert compounds. The details of solid waste generation and its management proposed are discussed in **Chapter 2, Section 2.11.6 & 2.11.7**. If the solid waste generated is not properly managed and disposed of in an unauthorized manner, it will impact soil quality, groundwater, and air quality.

2.16.7.2 Solid Waste Management

Strict guidelines will be put in place to manage solid waste generation during the operational phase of the development. The main goals of the guidelines will be to ensure adopting recycling techniques and encouraging sorting of solid waste at source into organic and inorganic wastes. Waste management is given in

Figure 2-24**.**

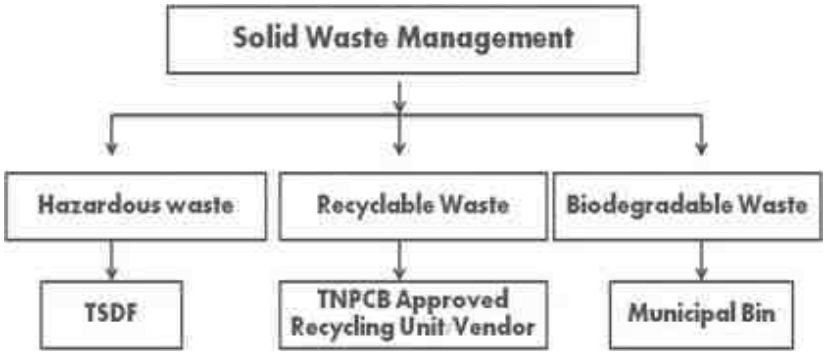

Figure 2-24 Waste Management Concepts

2.16.8 Afforestation

The safety distance along the eastern side of the lease area has been identified to be utilized for afforestation. Native species will be planted in phased manner as given in**Table 2-22.**

Table 2-22 Afforestation Plan details

Local Name of the Tree	Scientific Name of the Tree	Survival	No. of Species
Vaagai	Albizia Lebbeck	80 %	1200
Manjadi	AdenaantheraPavonina		
Aatru Poovarasu	Hibiscus Tiliaceous		
Panai	Borassus Flabellifer		
Yetti	StrychnosNuxvomica		
Purangai Naari, Pudanga Naari	Premna Tomentosa		
Magizha Maram	MimusopsElengi		
Puthranjivi	PuthranjivaRoxburghii		
Pisin Pattai	LitseaGlutinosa		
Sandhana Vembu	Toona Ciliate		
Eachai	Phoenix Sylvestre		

2.16.9 Assessment of New and untested technology for the risk of technological failure

The project is a Color Granite quarry project. The technology used for mining is made by TAMIN in house there would not be any changes in the Mining. The mining technology is a tried& tested method, and therefore there is no risk of technological failure. In addition to this, the TAMIN is being processed to take care of any technological failures.

3 DESCRIPTION OF ENVIRONMENT

3.1 Preamble

This chapter depicts the establishment of baseline for environmental components, as identified in and around the "Jakkery Colour Granite Quarry" in SF No. 486(Part) & 736/4, Jakkery Village, Denkanikottai Taluk, Krishnagiri District.The primary baseline data monitored covered three (3) months i.e., from **March - May 2024**, and secondary data was collected from Government and Semi-Government organizations. The primary baseline data has been conducted by M/s. Ekdant Enviro Services (P) Limited, Chennai, NABL approved Environmental Testing Laboratory for following Terrestrial environmental components.

S. No	Description of Section	Section	Parameters
1	Meteorology	Section 3.6.2	Temperature, Relative Humidity, Rainfall, Wind Speed & Direction
2	Ambient Air Quality	Section 3.6.4	As per NAAQS, 2009 and TVOC as per ToR
3	Ambient Noise Levels	Section 3.7	Day equivalent noise levels, Night equivalent noise levels (As per CPCB Standards)
4	Water Quality	Surface water – Section 3.8.2 Ground water – Section 3.8.3	Ground Water – IS 10500:2012 Surface Water – IS 2296 (Class – A)
5	Soil Quality	Section 3.9	ICAR (Indian Council of Agricultural research)
6	Ecology	Section 3.10	Flora and Fauna
7	Social Economic Status	Section 3.11	Socio Economic Profile of Study area (Population Profile, Employment and Livelihood, Education and Literacy, etc.,)

3.2 Description of Study Area

A 10 Km radial distance from the proposed project site boundary has been identified as the general study area for assessing the baseline environmental status. The core study area is the project area and its immediate surroundings to the tune of 1.0 Km radius from the boundary. Further the Project Impact/Influence Area (PIA) is 10Km from the boundary of the project. The PIA covers approximately 22 villages and 1 Township. The map showing the satellite image of the study area is given in **Figure 3-1** and Topo Map of the study area is given in **Figure 3-2.**

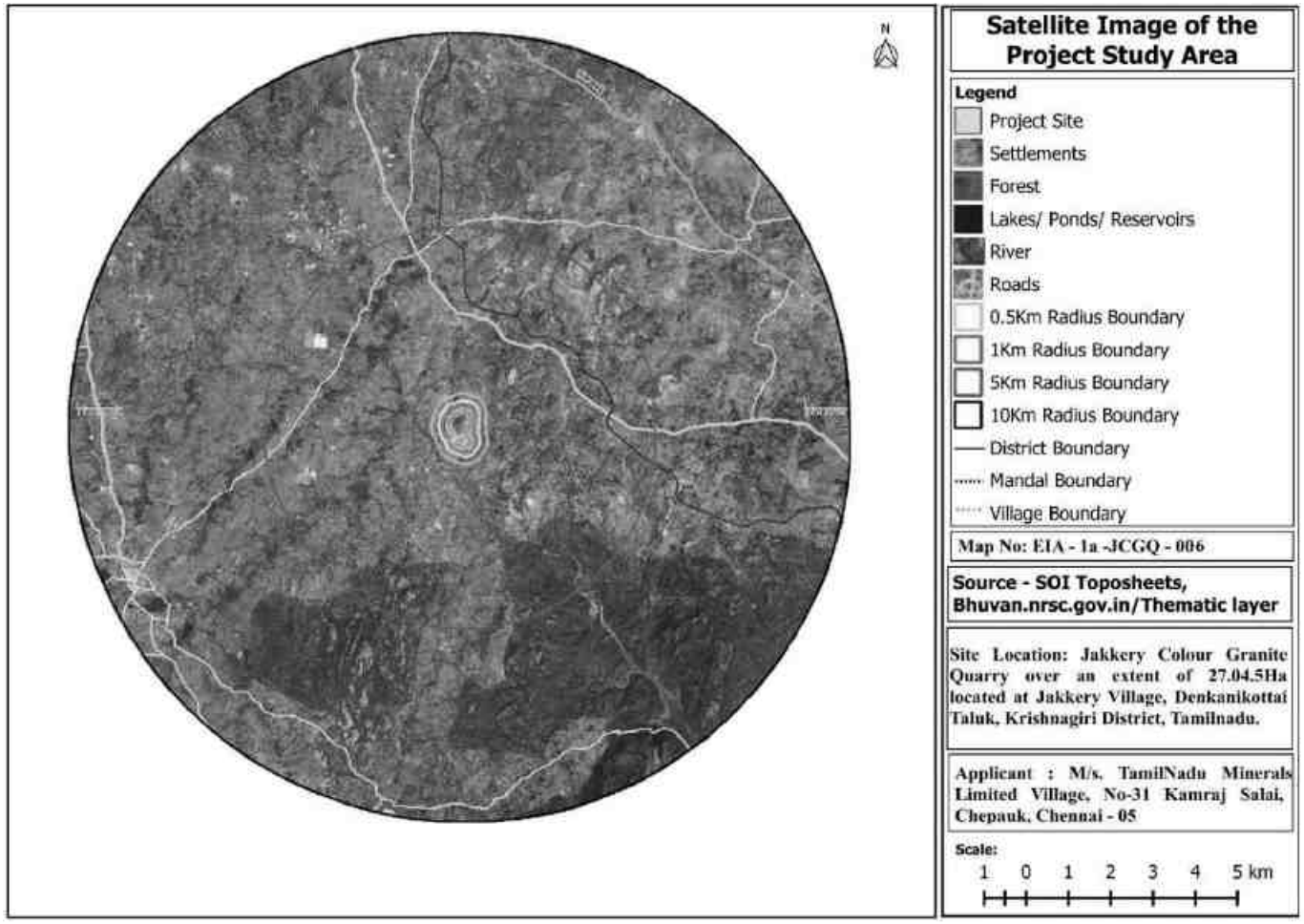

Figure 3-1 Satellite Image of the study area of Project

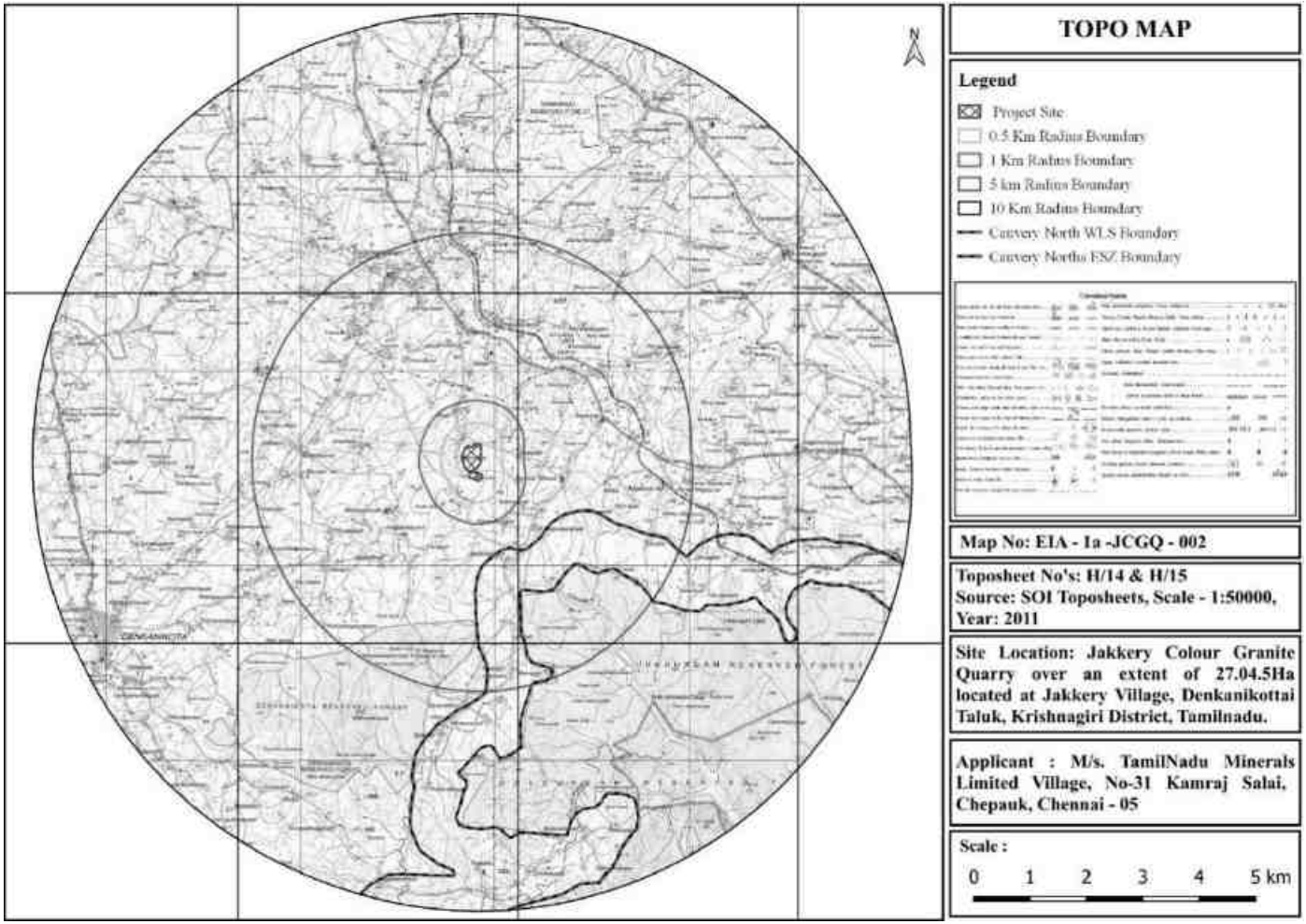

Figure 3-2 Topo Map of Study area

3.3 Environmentally/Ecologically Sensitive areas

The environmental sensitive areas covering an aerial distance of 15km from the project boundary is given in **Table 3-1** and Map showing Environmental sensitive areas within 15 km from project boundary is given in **Figure 3-3.**

Table 3-1 Environmentally Sensitive Areas within 15km from Project Boundary

S. No.	Areas	Distance & Direction from project boundary
1	List of Monuments and Heritages	Nil within the 15km radius.
2	List of Water Bodies	

S. No.	Location	Distance	Direction
1	Panchapalli Dam	9.24	SSE
2	Nagamangalam Lake	7.41	E
3	Lake near Narappanatti	5.17	S
4	Lake near Puvanapalli	2.61	WSW
5	Lake near Bitireddi	4.04	W
6	Lake near Varaganapalli	5.46	E
7	Lake near DoddeGaunapalli	3.58	NNW
8	Kelamangalam Lake	4.09	NNW
9	Lake near Gopasandram	4.09	NNW
10	Lake near Kelamangalam RS	5.33	N
11	Lake near D.Kottappalli	6.47	N
12	Lake near Tuppuganappalli	6.71	NE
13	Lake near Kommepalli	8.2	NNE
14	Lake near Jonbanda	12.27	N
15	Lake near Uddanapalli	8.43	ENE
16	Lake near Pillyakottur	13.97	NE
17	Lake near Kamandoddi	14.1	NNE
18	Lake near Eripanchapalli	14.34	SE
19	Lake near Timmasandiram	6.99	SW
20	Lake near Denkanikottai	8.77	WSW

3	List of Reserved Forests	

S. No.	Location	Distance	Direction
1	Udedurgam RF	2.99	SSE
2	Marandahalli Extension RF	8.65	SSE
3	Aiyur RF	10.48	SSE
4	Aiyur Extension RF	9.73	SSE
5	Denkanikotta RF	3.21	S
6	Nohanur RF	10.93	SW
7	Sanamavu RF	5.37	N

<table>
<tr><td></td><td></td><td><table><tr><td>8</td><td>RF</td><td>7.86</td><td>N</td></tr></table></td></tr>
<tr><td>4</td><td>Nearby Town, City and Head Quarters</td><td>Town: Hosur ~ 17.18 Km (NNW).
City: Bangalore ~ 36.30Km (NW)
District HQ: Krishnagiri ~ 33.78Km (E).</td></tr>
<tr><td>5</td><td>Nearest Airport, Port and Railway Stations</td><td>Railway Station: PeriyaNagathunai ~ 4.08Km (E)
Airport: Kempegowda Int. Airport ~69.75Km (N).</td></tr>
<tr><td>6</td><td>Nearest Densely Populated Habitations</td><td><table>
<tr><th>S. No.</th><th>Location</th><th>Distance (km)</th><th>Direction</th><th>Population</th></tr>
<tr><td>1</td><td>Kelamangalam</td><td>4.04</td><td>NNW</td><td>11052</td></tr>
<tr><td>2</td><td>Denkanikottai</td><td>8.62</td><td>WSW</td><td>24252</td></tr>
<tr><td>3</td><td>Uddandapalli</td><td>8.21</td><td>ENE</td><td>4691</td></tr>
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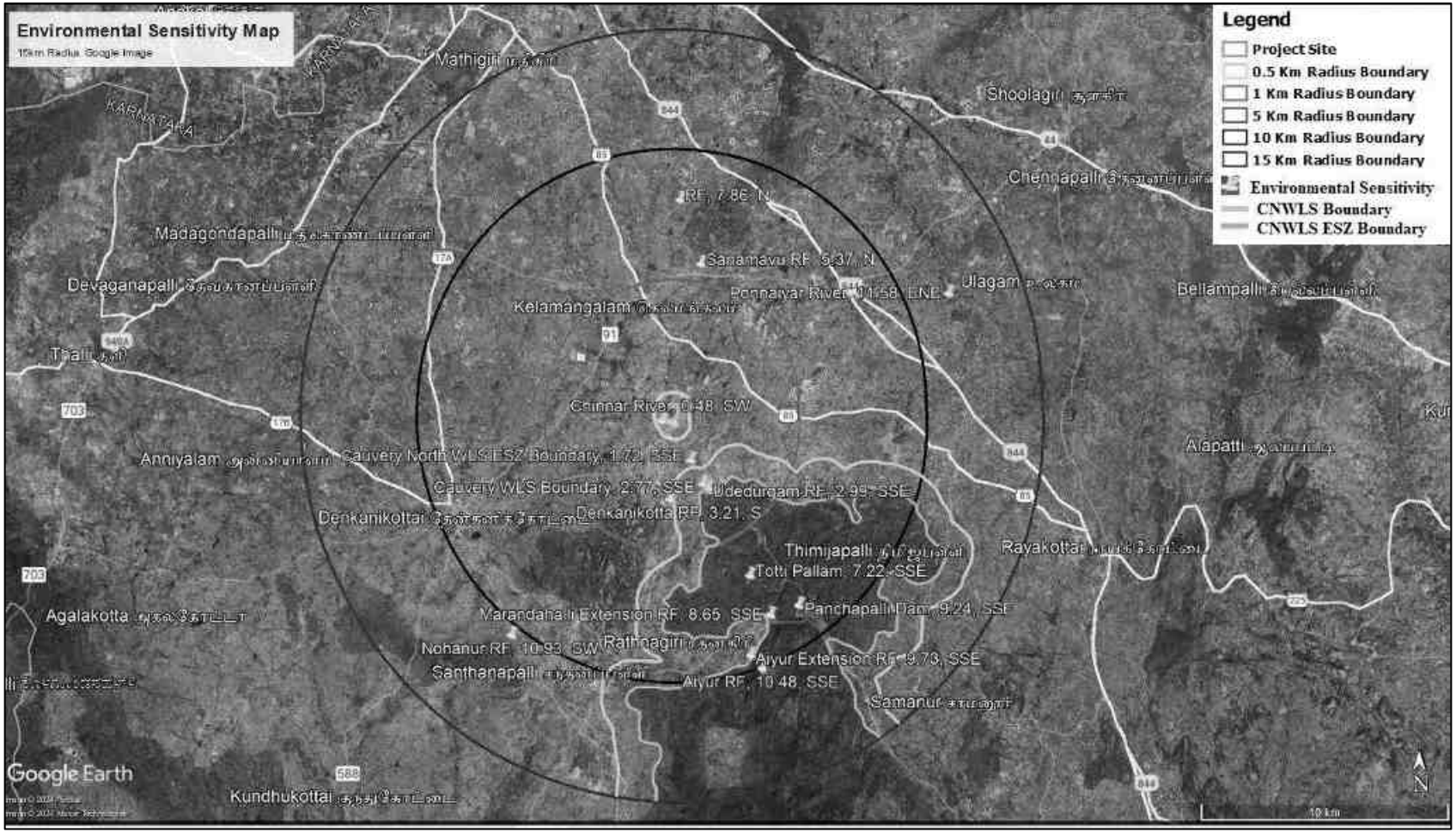


Figure 3-3Environmental sensitive areas within 15 km from project boundary

3.4 Physical Conditions of PIA district

In this section, the physical conditions of PIA district are discussed in general and wherever possible references to the conditions prevailing in the study area in particular are also provided.

3.4.1 PIA District Profile

Krishanagiri district had been formed 30th district of the Tamil Nadu by bifurcation of Dharmapuri district on 9th February 2004. It covers an area of 5143 Sq.km. Krishnagiri district is bounded by Vellore and Thiruvannamalai districts to the east, state of Karnataka to the west, the state of Andhra Pradesh to the north and Dharmapuri district to the south. This district is elevated from 300 m to 1400 m above the mean sea level. It is located between 11˚12' N and 12˚49' N latitude, 77˚27'E to 78˚38'E longitude.

Source : ***https://tnmines.tn.gov.in/pdf/dsr/25.pdf***

3.4.2 Climatic Conditions and Rainfall

The district receives rain under the influence of both Southwest and Northeast monsoons. July - November is Rainy Season and between December - February winter prevails. The annual rainfall over the district varies from about 750 mm to about 900 mm. It is the minimum around Hosur (767.7 mm) and Rayakottai (768 mm) in the northern and central parts of the district. It gradually increases towards west and east and is the maximum around Denkanikotai (910.7 mm) in the western part.

Source : ***https://tnmines.tn.gov.in/pdf/dsr/25.pdf***

3.5 Natural Resources of PIA District

3.5.1 Forest Resources of PIA district

Krishanagiri is one among the districts of Tamil Nadu, which with natural resources having 2,024 sq.kms. of forest cover is its unique feature. The hill ranges of this district are called by the name 'Melagiri'. The major type of forest seen here are Tropical, Deciduous forests, thorny shrubs and bamboo forest. Dense forest cover Denkanikottai region. The other region contains shrubs, hills and hillocks with bushes.

Source ***:*** ***https://tnmines.tn.gov.in/pdf/dsr/25.pdf***

3.5.2 Irrigation of PIA district

The irrigation sources of the district indicate that wells were the major source of irrigation

supplemented by tanks and canals. The tube wells formed an important source of irrigation for the Hosur and Denkanikottai taluks. Tube wells formed the major source of irrigation (66 percent) followed by tanks, (16 per cent) wells, (16 per cent) canal (2 per cent) and other sources in that order. The wells dug under private sector with pump sets were seen in most places and private tube wells were the next source in utilizing the ground water potential. The Public Works Department and Panchayat union-maintained tanks, ponds and supply channels also play an important role in the irrigation of Krishnagiri District. The major irrigated crops in the district are paddy, ragi, turmeric, sugarcane, banana, tomato, ground nut, cotton, coconut and flowers. The irrigated area is under vegetables, fruit and flowers. Farmers have adopted cultivation methods through judicious use of water with modern water management techniques and technology. The yield of those crops can be increased as there is market proximity and connectivity to Cities. The productivity of food crops like paddy, ragi and pulses can also be increased by proper water management practices.

Source :https://krishanagiri.nic.in/departments/agriculture/

3.5.3 Agricultural Resources of PIA district

Krishnagiri district is one of the potential districts for cultivation of agricultural and horticultural crops. Total cultivated area of 224767 Hectares, out of which 180902 Ha Net cultivated area against the 5,14,325 Ha. of total geographical area. The total normal area cultivated under all crops is 224767 Hectares out of which 73046 Ha is under irrigated and 151720 ha area under rainfed crops. The major agricultural crops in the district are Paddy, Ragi, Red gram, Cowpea, Maize, Cumber, Groundnut, Horse gram and minor millets. The major cultivated area of agricultural crops is occupied by rainfed agriculture. The total number of 2,81,733 farmers engaged in agriculture out of which 213023 are Marginal farmers (76%), 45970 are small farmers (16%), remaining 4615 farmers (8%) are medium and large farmers.

Source : https://krishanagiri.nic.in/departments/agriculture/

3.5.4 Mineral Resources of PIA district

The Geological formation consists of Biotite Hornblende gneisses, calegneisses and crystalline limestone intruded by younger granites. The granite gneiss and crystalline limestone represent ancient calcarious sediments which have suffered repeated metamorphism, inclusions by granite sand folding during Archaean age. The crystalline limestone deposits in the areas of the villages of samalpatti / Padavanur, Uthangarai Taluk of Krishanagiri District is fine grained and are mainly made up of aggregate of calcite with subordinate amount of quartz and silicate minerals. They occur as long, narrow band sand as veins within the gneissic country rocks. The limestone is generally white, pink and grey in colour. The main impurity in the limestone is silica. As far as the grade of the limestone is concerned it is of ‘Cement and Refractory Grade’. The calcium

carbonate is about 85%andtherestismainly made up of silica in the form of free silica or as silicate minerals such as wollastonite, feldspar.

Source :https://tnmines.tn.gov.in/pdf/dsr/25.pdf

3.5.5 Land Use & Land Cover of PIA district

Total geographic area of Krishnagiri district is **5026.01 Sq.Km**. Urban Built-up area is 67.23 Sq. Km and Rural Built-up area is 95.11Sq.Km. Details of land use/land cover statistics for Krishnagiri district were given in **Table 3-2.**Land Use pattern of Krishnagiri district is given in **Figure 3-4**.

Table 3-2 District land use/land cover statistics (2015-16) for Krishnagiri district

S. No	Division of Land Use/Land Cover	Area in Sq. km.	Area (%)
1	Agriculture, Crop land	2335.71	46.47
2	Agriculture, Fallow	353.58	7.04
3	Agriculture, Plantation	486.05	9.67
4	Barren/unculturable/wastelands, Barren rocky	44.05	0.88
5	Barren/unculturable/wastelands, scrub land	375.56	7.47
6	Barren/unculturable/wastelands, salt affected land	1	0.02
7	Built up, Mining	45.14	0.90
8	Built up, Rural	95.11	1.89
9	Built up, Urban	67.23	1.34
10	Forest, Deciduous	1076.93	21.43
11	Forest, Evergreen/semi-Evergreen	2.1	0.04
12	Forest, plantation	4.25	0.08
13	Grass/Grazing land	0.02	0.00
14	Wetlands/ Water bodies, Coastal wetland	0.04	0.00
15	Wetlands/ Water bodies, River/stream/canals	50.34	1.00
16	Wetlands/ Water bodies	88.9	1.77
Total		**5026.01**	**100.0**

Source :https://bhuvan-app1.nrsc.gov.in/thematic/thematic/index.php

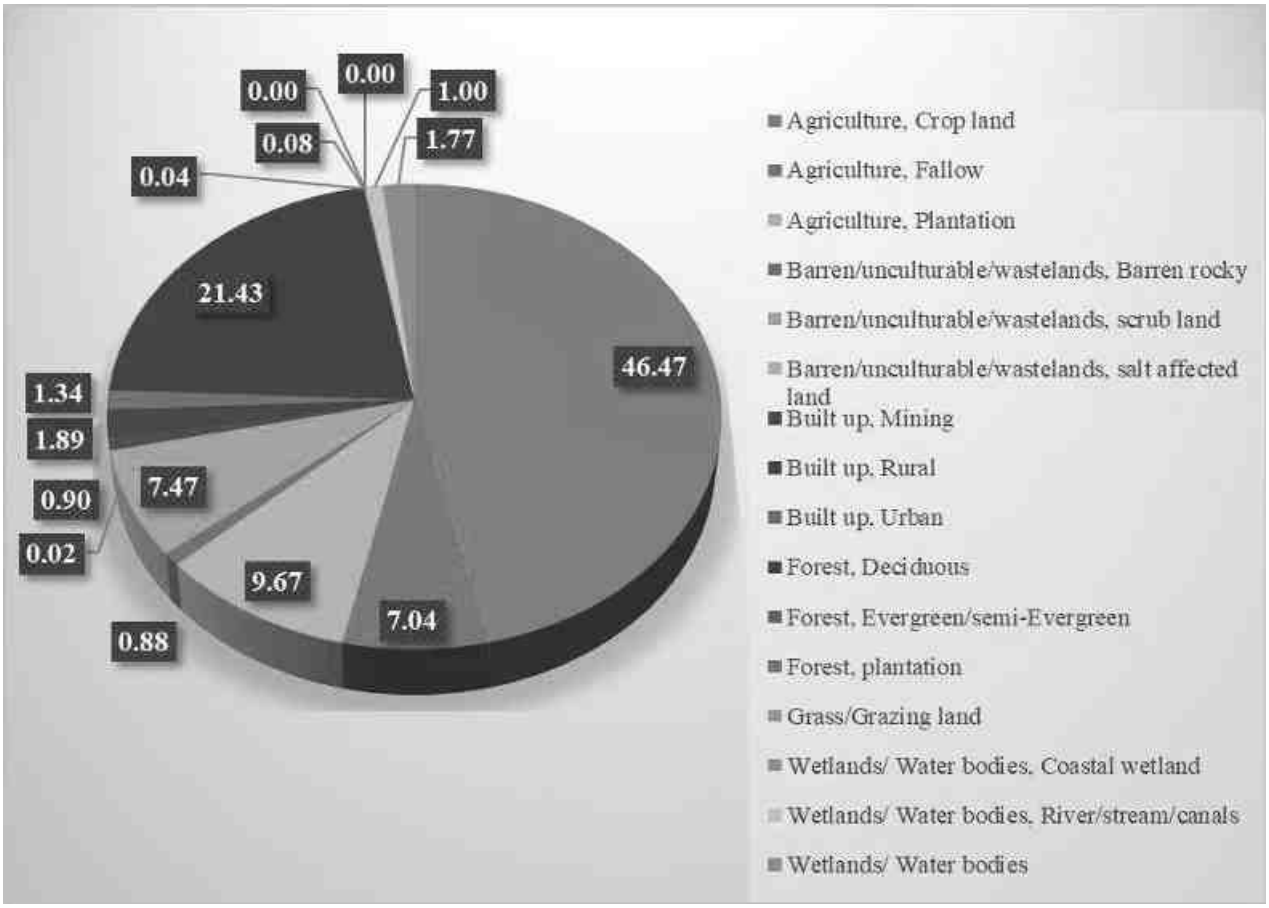


Figure 3-4 Land Use pattern of Krishnagiri district

3.5.5.1 Land Use and Land Cover of the Study Area

The total Project Study area is **336.52 Sq.km**. The Land Use Pattern is given in **Table 3-3.** The Land Use Pattern and Land Use Map of the Study area are given in **Figure 3-5** and **Figure 3-6** respectively.

Table 3-3 Land Use Pattern of the Study Area

S. No	Description	Area (Sq. Km)	Area (Acres)	Area (Hectares)	Percentage (%)
1	Barren rocky	5.52	1364.02	552	1.64
2	Crop land	185.6	45862.69	18560	55.15
3	Deciduous	57.81	14285.14	5781	17.18
4	Evergreen / Semi Evergreen	0.18	44.48	18	0.05
5	Fallow	25.78	6370.37	2578	7.66
6	Mining	5.28	1304.71	528	1.57
7	Plantation	21.32	5268.28	2132	6.34
8	River / Stream / Canals	2.36	583.17	236	0.70
9	Rural	6.22	1536.99	622	1.85
10	Scrub land	18.5	4571.44	1850	5.50
11	Urban	1.63	402.78	163	0.48
12	Waterbodies	6.32	1561.70	632	1.88
Total		**336.52**	**83155.77**	**33652**	**100**

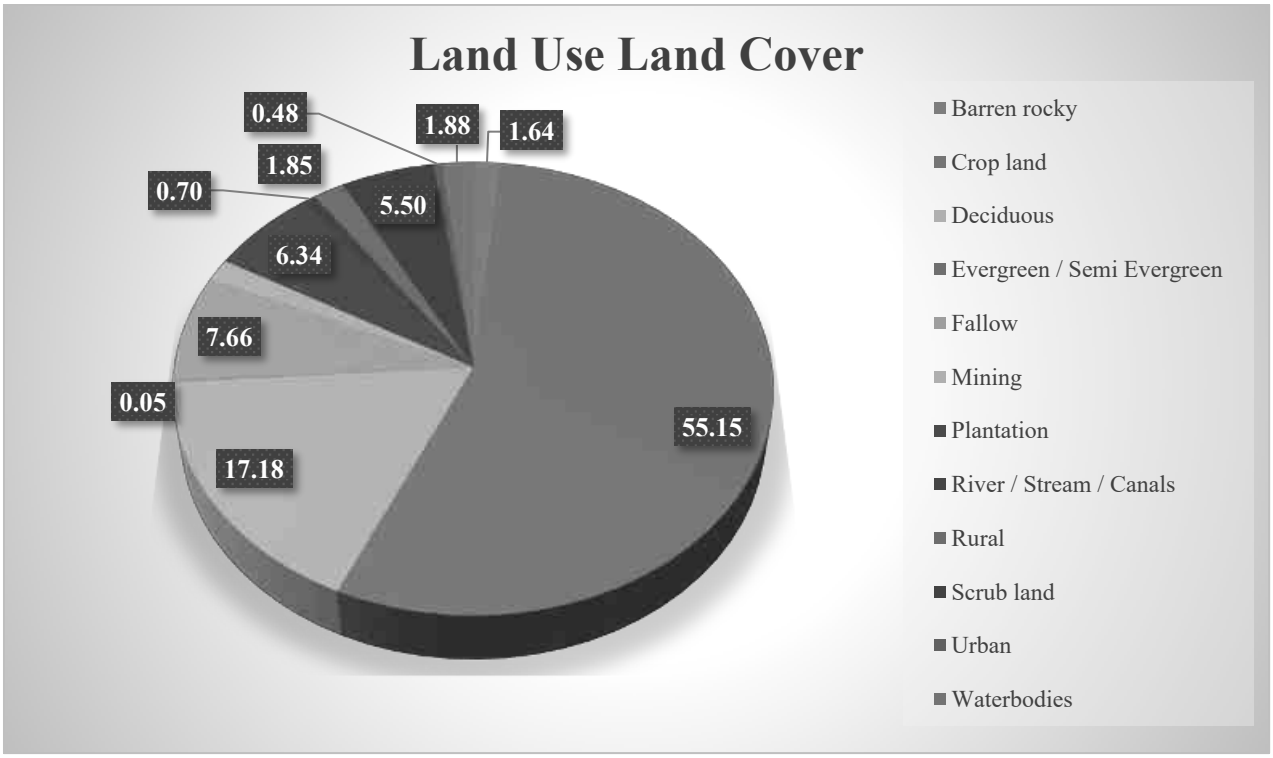


Figure 3-5 Land Use Pattern of the Study Area

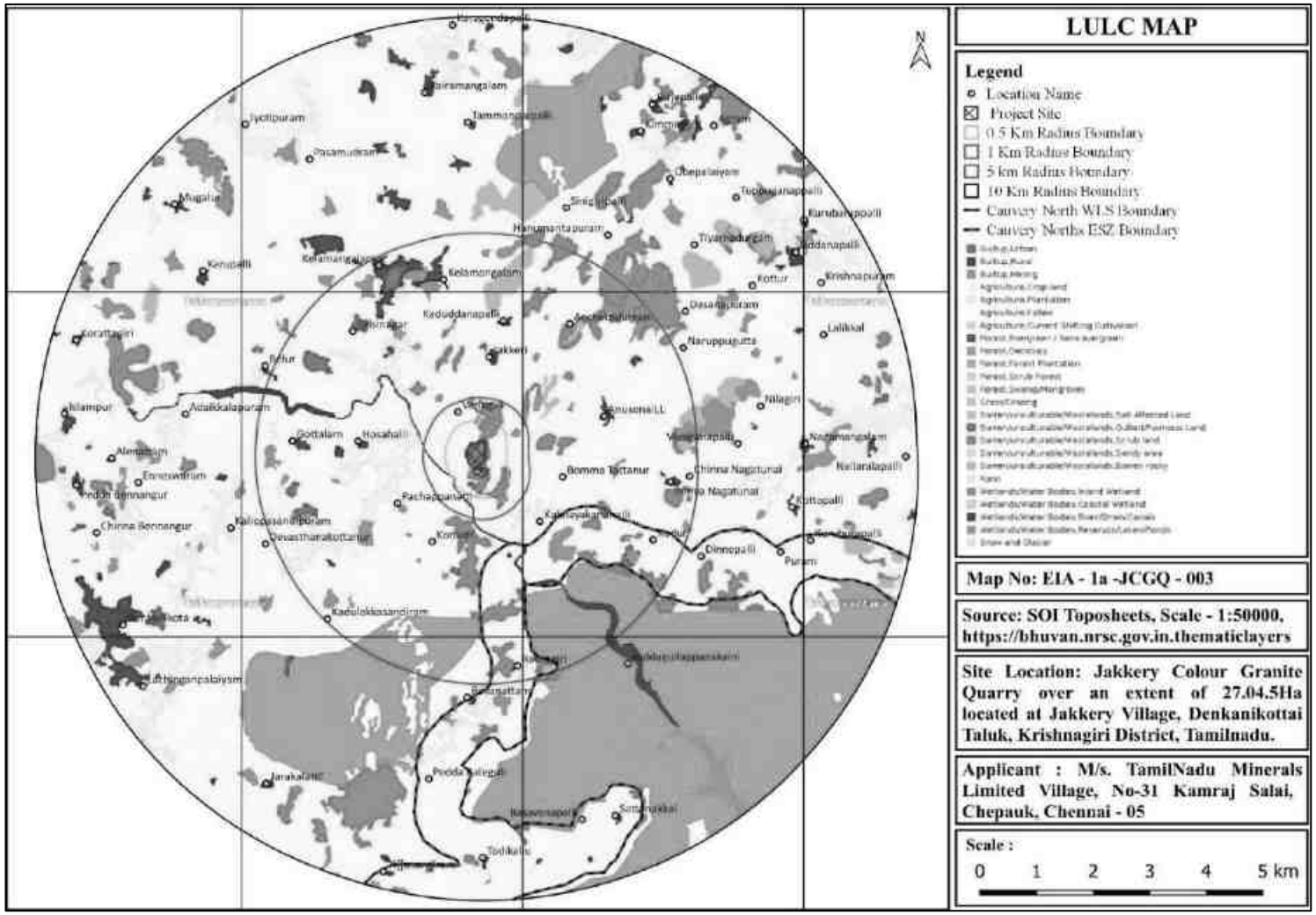


Figure 3-6 Land Use Land Cover map of the study area

3.5.6 Geology of PIA district

The geological formations of the district belong mainly to Archaean age along with rock of Proterozoic age. The former is represented by Khond alite Group of rocks, Charnockite Group of rocks, Migmatites Complex, Sathya Mangalam Group of rocks, while the latter is represented by Alkaline rocks. The Khond alite Group includes garnet sillimanite gneiss and quartzite which occur as small patches. The migmatite complex includes garnet ferous quartz of felspathic gneiss and hornblendes biotite gneiss, the former exposed on the western part of the district. The Sathya Mangalam Group includes fuchsite quartzite, sillimanite mica schist and amphibolite's. The Bhavani Group in this area includes fissile 13hornblende-biotite gneiss, granitoid gneiss and pink migmatite. Amphibolite's with barbed ferruginous quartzite and associated quartz of felspathic rocks (Champion Gneiss) represent the Kolar group and are found west and southwest of Veppanapalli. Following this there are basic in turions occurring as dykes. The Charnockite Group occupies a major part of the south-west portion of this district with small bands of Garnet ferrous quartz of felspathic gneiss, Granite gneiss and dolerite dykes. Contour map of the study area is given in**Figure 3-7.**

Source : ***https://tnmines.tn.gov.in/pdf/dsr/25.pdf***

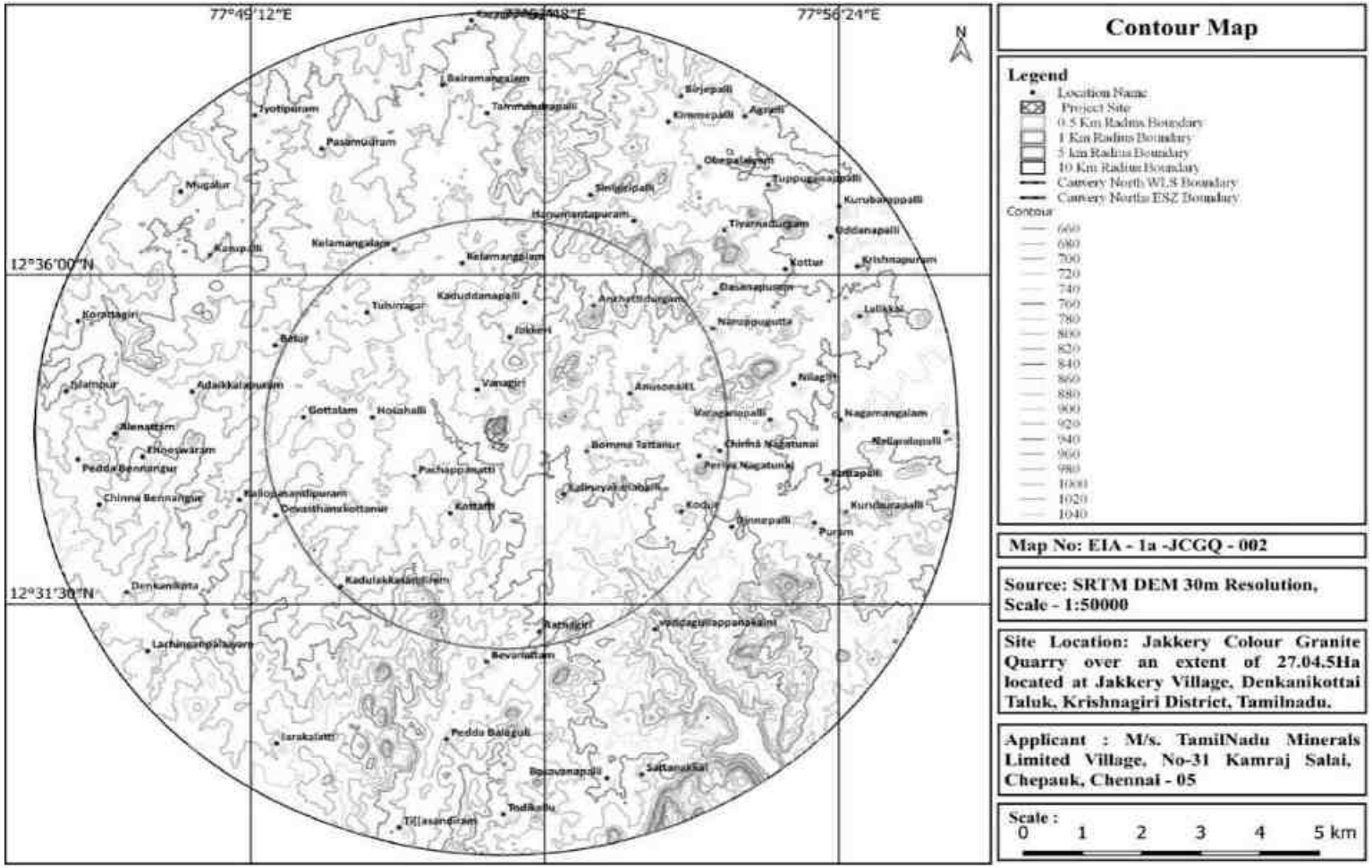


Figure 3-7 Contour map of study area

3.5.7 Geomorphology of PIA district

The prominent geomorphic units identified in the district through interpretation of satellite imagery are structural hills in the southwestern part of the district, denudational landforms like buried pediments in the plains and inselbergs and plateaus represented by conical hills aligned with major lineaments. Krishnagiri district forms part of the upland plateau region with many hill ranges and undulating plains. The western part of the district has hill ranges of Mysore plateau with a chain of undulating hills and deep valleys extending in NNE-SSW direction. The plains of the district have an average elevation of 488 m amsl. The plateau region along the western boundary and the northwestern part of the district has an average elevation of 914 m amsl. The Guthrayan Durg with an elevation of 1395 m amsl is the highest peak in the district.

Source :http://cgwb.gov.in/district_profile/tamilnadu/krishanagiri.pdf

3.5.8 Geomorphology of the Study Area

The total Geographical area of the study area is **336.52 Sq.Km**. The Geomorphology of the study area is given in **Table 3-4** and Geomorphology pattern and Geomorphology Map of the study area is given in **Figure 3-8** and **Figure 3-9** respectively.

Table 3-4 Geomorphology of the Study Area

S. No	Description	Area in Sq.km	Area in Acr	Area in Ha	Percentage
1	Structural Origin-Moderately Dissected Hills and Valleys	60.491	14947.63	6049.1	17.98
2	Structural Origin-Low Dissected Hills and Valleys	8.255	2039.85	825.5	2.45
3	Structural Origin-Moderately Dissected Upper Plateau	0.299	73.88	29.9	0.09
4	Denudational Origin-Low Dissected Hills and Valleys	2.924	722.54	292.4	0.87
5	Denudational Origin-Pediment-PediPlain Complex	255.202	63061.69	25520.2	75.84
6	Anthropogenic Origin-Anthropogenic Terrain	0.669	165.31	66.9	0.20
7	Waterbodies	8.68	2144.87	868	2.58
Total		**336.52**	**83155.77**	**33652**	**100.00**

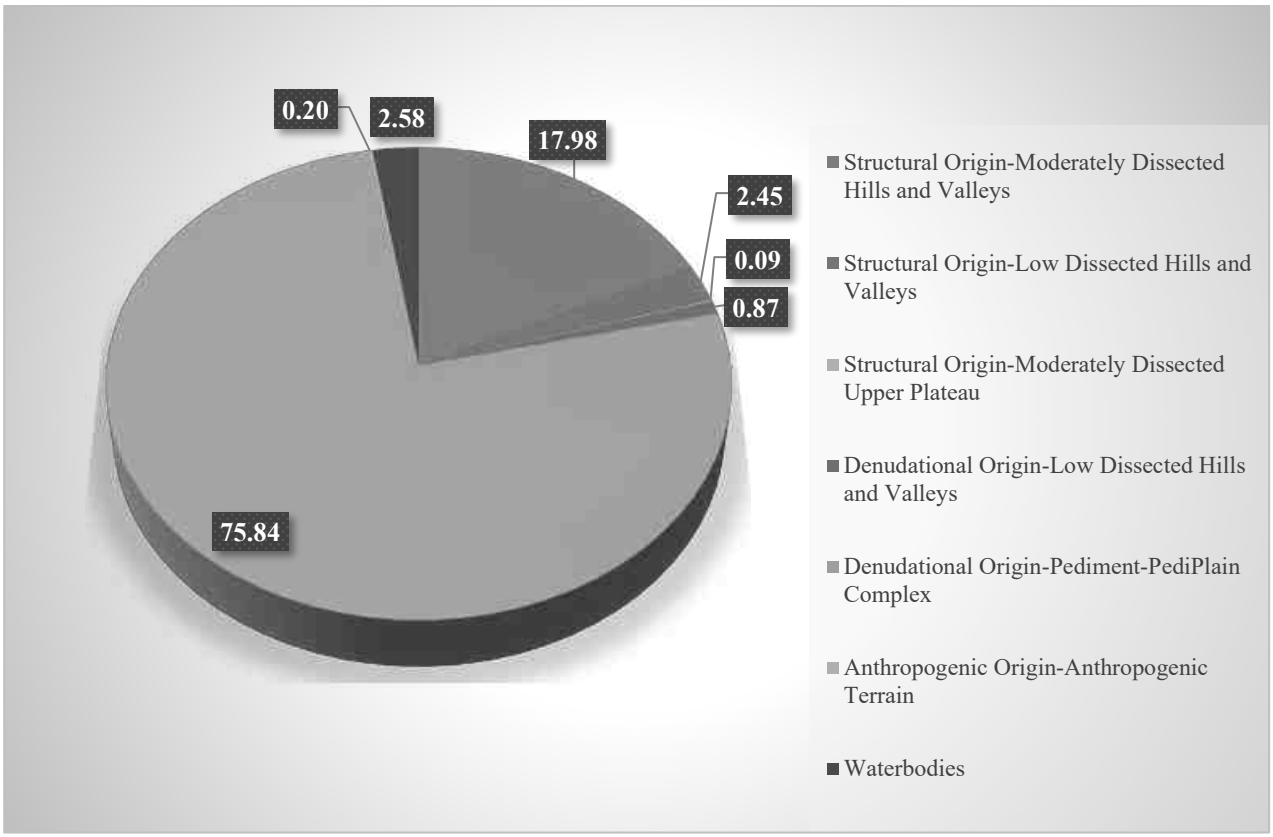


Figure 3-8 Geomorphology Pattern of the Study Area

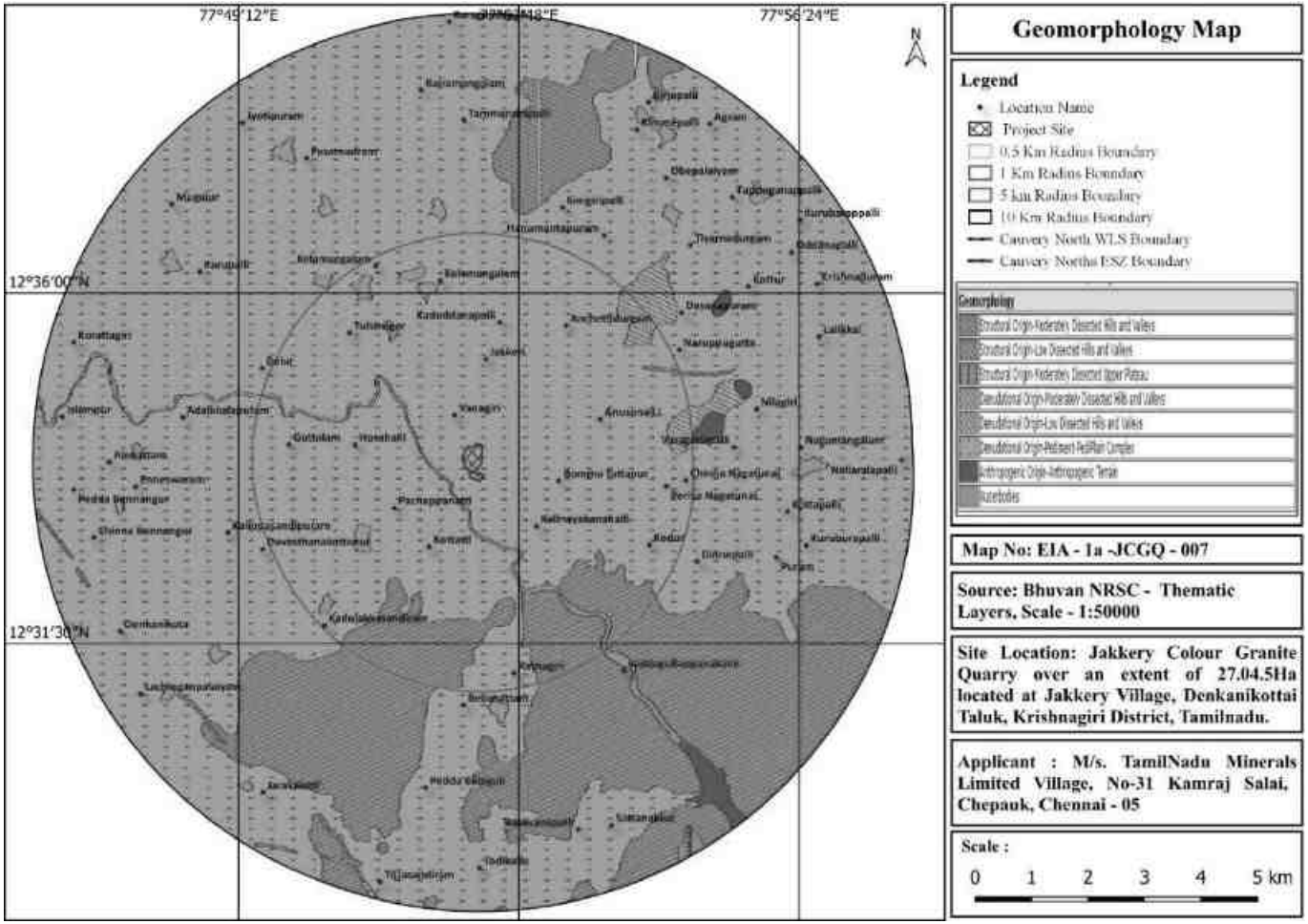


Figure 3-9 Geomorphology map of the study area

3.5.9 Hydrogeology of PIA district

Krishnagiri district is underlined by Archaean crystalline formations with Recent alluvial deposits of limited areal extent and thickness along the courses of major rivers. The occurrence and movement of ground water are controlled by various factors such as physiography, climate, geology and structural features. Weathered, and fractured crystalline rocks constitute the important aquifer systems in the district. Ground water generally occurs under phreatic conditions in the weathered mantle and under semi-confined conditions in the fractured zones at deeper levels.

Source :http://cgwb.gov.in/district_profile/tamilnadu/krishanagiri.pdf

3.5.10 Drainage Pattern of PIA district

Krishnagiri district basically has a mountainous terrain. The General regional slop is towards east. The various landforms occurring in the districts such as structural hills, erosional plains residual hills, rolling uplands of different facies belonging to the denudational and structural landforms. Cauvery River forms the southwestern boundary of the district. Pennaiyar is the major river draining the district and is ephemeral in nature. The major reservoirs are KRP dam, Kelavarapalli Dam and Barur Lake. The drainage map of the Study Area is given in **Figure 3-10.**

Source : https://tnmines.tn.gov.in/pdf/dsr/25.pdf

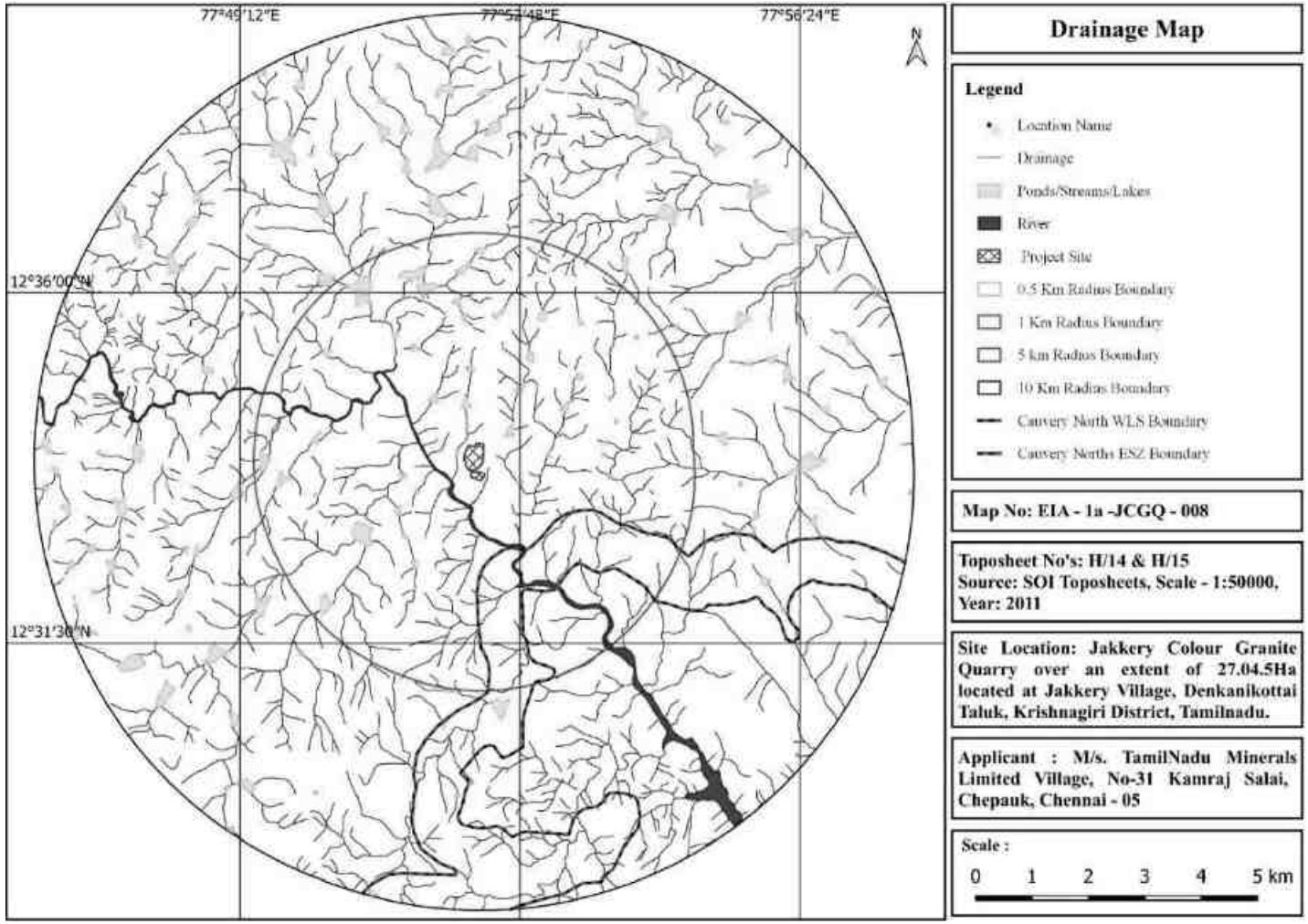


Figure 3-10 Drainage map of the study area

3.5.11 Seismicity

As per Seismicity Map of India, the project location/study area falls in Zone II, which is categorized as a Least Active Zone. The Seismicity Map of India is shown in **Figure 3-11.**

Figure 3-11 Seismicity map of India

3.5.12 Soils of PIA District

The soil in the district is quite loose and fresh with its color from red to dark brown. The soil has low nitrogen and phosphate content with marked variation between different taluks. Red soil is predominantly found in Hosur, Shoolagiri, Kelamangalam and Anchetty taluks and accounted

for 45.6 percent area of the total geographical area. Krishnagiri and Uthangarai taluk comprised of clay soil which occupied eight percent of area and nearly 40 percent of area in all the taluks was under forest and barren soil.

Source : ***https://tnrtp.org/wp-content/uploads/2020/07/KRISHANAGIRI-FINAL.pdf***

3.6 Air Environment

Baseline ambient air quality assessment gives the status in the vicinity of site and is an indispensable part of environmental impact assessment studies. The baseline status of air environment in the study area is assessed through a systematic air quality surveillance programme.

3.6.1 Meteorological Conditions

The regional air quality is influenced by the meteorology of that region. The principal weather parameters that influence the concentration of the air pollutants in the surroundings are wind speed, wind direction and temperature. Meteorological data is useful for proper interpretation of the baseline data. It is used as input for air quality dispersion models for predicting the post project environmental scenario i.e., ground level concentrations due to proposed utilities.

3.6.2 General Meteorological Scenario based on IMD Data

The nearest Indian Meteorological Department (IMD) station located to project site is Bangalore (A). The Climatological data of Bangalore (A), published by the IMD, based on daily observations at 08:30 and 17:30 hour IST for a 29-year period (1971-2000), is presented in the following sections on the meteorological conditions of the region. The monthly variations of the relevant meteorological parameters are reproduced in **Table 3-5.**

Table 3-5 Climatological Summary –Bangalore (A) (1971-2000)

Month	Temp (°C)		Rainfall		Mean Wind Speed (Kmph)	Predominant Wind Directions (From)	
	Daily Max.	Daily Min.	Total (mm)	No. of days		08:30	17:30
Jan	27.4	14.2	1.8	0.0	5.7	E	E
Feb	30.1	15.9	7.6	0.4	6.3	E	E
Mar	32.7	18.2	14.0	0.8	6.6	E	E
Apr	34.0	20.8	40.0	2.8	6.9	SW	E
May	33.1	20.9	94.4	6.0	9.8	W	W
Jun	29.8	19.8	80.5	5.0	16.9	W	W

Month	Temp (°C)		Rainfall		Mean Wind Speed (Kmph)	Predominant Wind Directions (From)	
	Daily Max.	Daily Min.	Total (mm)	No. of days		08:30	17:30
Jul	28.6	19.4	102.7	7.4	16.6	W	W
Aug	28.0	19.2	116.6	9.3	14.7	W	W
Sep	28.5	19.3	195.6	9.6	9.6	W	W
Oct	28.0	19.0	152.0	8.7	6.1	W	E
Nov	26.8	17.0	58.4	4.1	5.1	E	E
Dec	26.1	15.1	17.3	1.5	5.5	E	E
Max.	34	20.9	195.6	9.6	16.9	**The Predominant wind direction is West**	
Min.	26.1	14.2	1.8	0	5.1		
Annual Avg./Total.	**29.4**	**18.2**	**880.9**	**55.7**	**9.2**		

Source : IMD

3.6.3 Meteorological Scenario during Study Period

The meteorological scenario in and around the project site is an essential requirement during the study period for proper interpretation of baseline air quality status. Meteorological data was collected during the study period (**March 2024 –May 2024**) and is presented in**Table 3-6**. The wind rose for the study period is given in **Figure 3-12**.

Table 3-6 Meteorological Data for the Study Period (March 2024 –May 2024)

S. No	Parameter	Observation
1.	Temperature	Max Temperature: 40^0C Min Temperature: 21^0C Avg Temperature: 33.5^0C
2.	Average Relative Humidity	43.25 %
3.	Average Wind Speed	5.26 m/s
4.	Predominant Wind Direction during study period	South

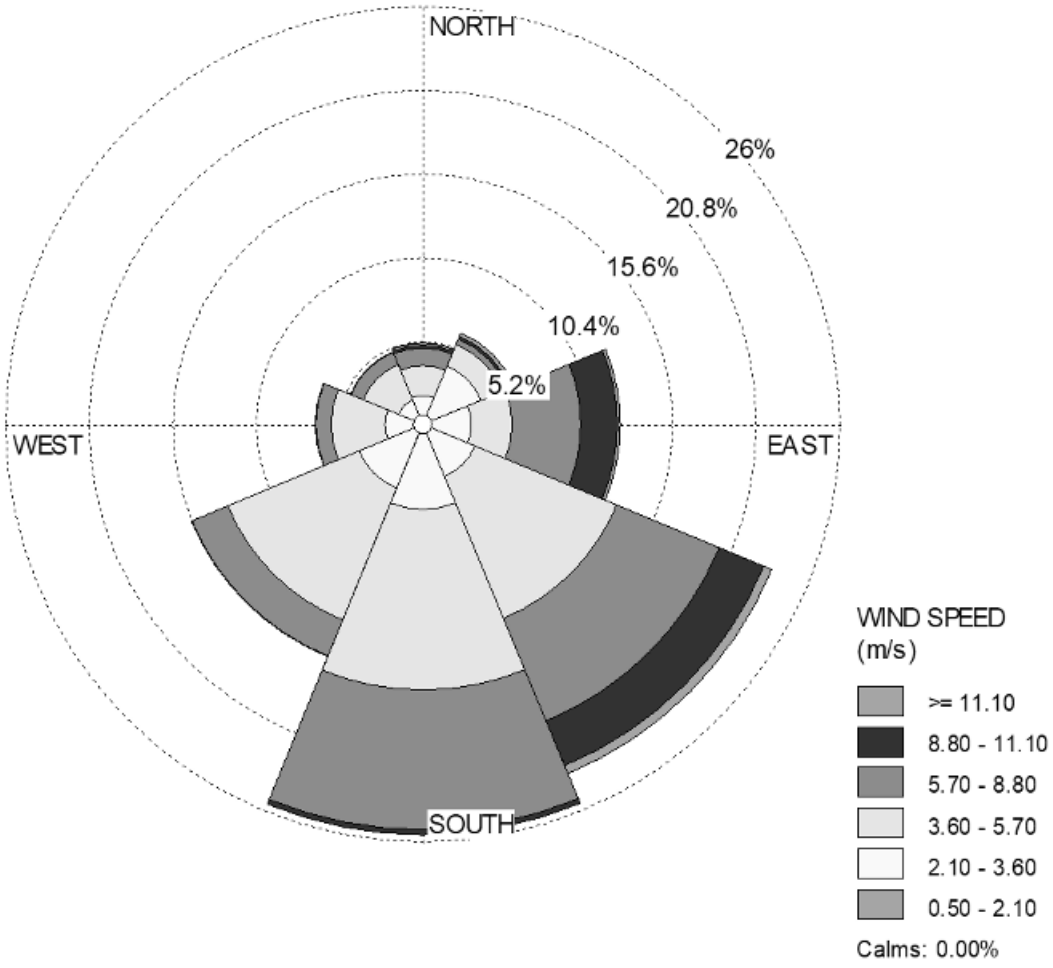


Figure 3-12 Wind rose for the study period

3.6.4 Ambient Air Quality

3.6.4.1 Ambient Air Quality Monitoring Stations

Eight (08) monitoring locations have been identified as per annual wind predominance of Bangalore (A) from IMD. AAQ monitoring locations are selected based on Annual wind predominance, map showing the Ambient Air Quality monitoring locations is given in **Figure 3-13** and the details of the locations are given in

Table 3-7.

Table 3-7 Details of Ambient Air Quality Monitoring Locations

Station Code	Location	Type of Wind	Longitude	Latitude	Distance (km) from Project boundary	Azimuth Directions
A1	Tiyarnadurgam	C/W	77.91588621	12.6109526	6.8	NE
A2	Irutalam	D/W	77.84751834	12.57310363	4	ENE
A3	Anusonai	D/W	77.89786015	12.573019	2.84	ENE
A4	Near Project Site	C/W	77.87273332	12.56157117	0.16	ESE
A5	Kudur	D/W	77.90780113	12.54712686	4.3	ESE
A6	Near Denkanikota	C/W	77.80167954	12.51707963	8.79	WSW
A7	Hosahalli	U/W	77.84449325	12.56727775	2.59	W
A8	Kelamangalam	C/W	77.85195034	12.60446697	4.53	NNW

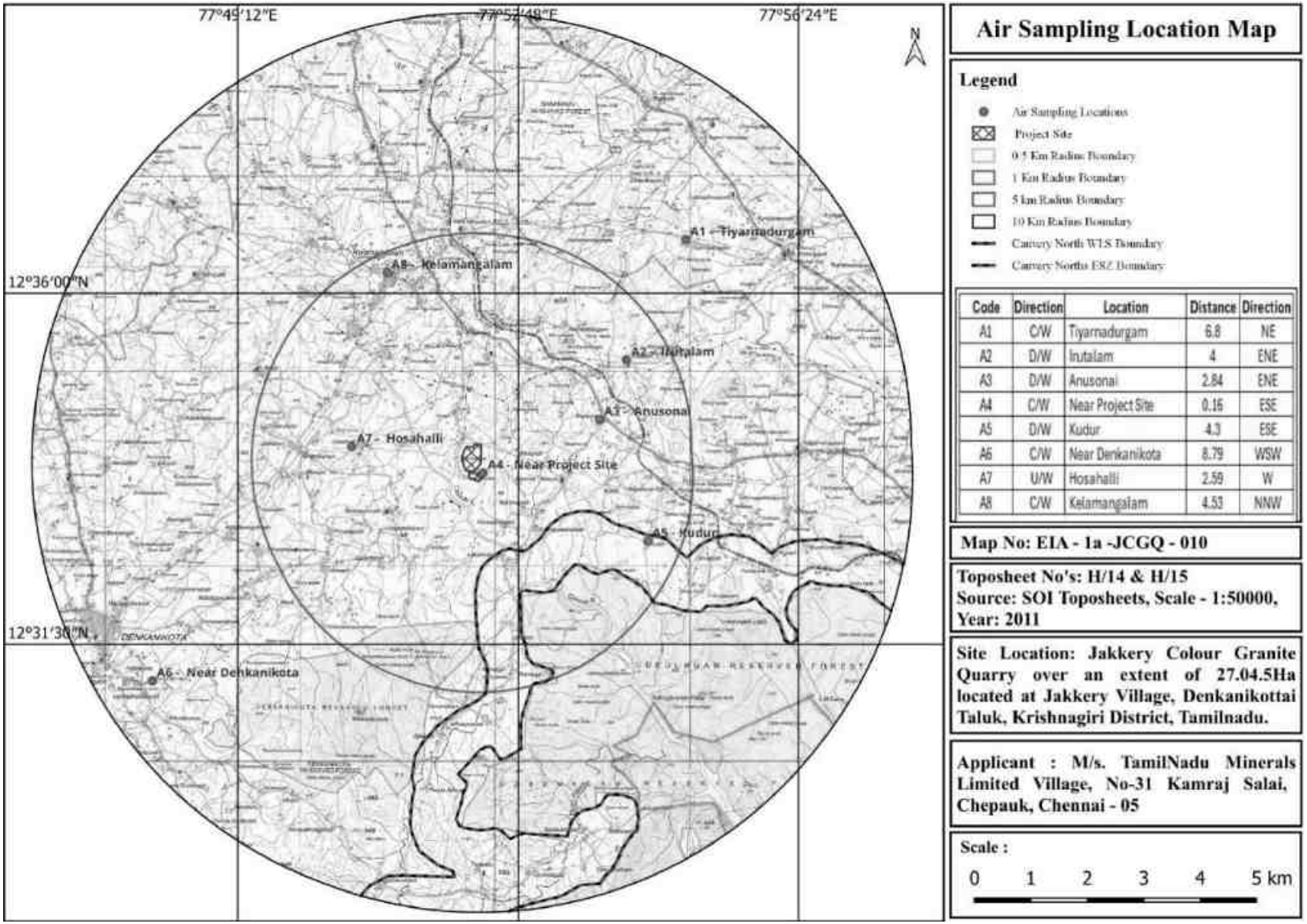


Figure 3-13 Ambient Air Quality monitoring locations

3.6.5 Ambient Air Quality Monitoring Techniques and Frequency

Ambient air quality was monitored twice a week for One (01) season (shall cover 12 weeks), i.e., 3 months (**March 2024 –May 2024**). PM_{10}, $PM_{2.5}$, SO_2, NO_x, Pb, NH_3, C_6H_6, $C_{20}H_{12}$, As, Ni and TVOC were monitored. Sampling was carried out as per Central Pollution Control Board (CPCB) monitoring guidelines at each location. Analytical methods used for analysis of parameters are given in**Table 3-8**and the Summary of the average baseline concentrations of pollutants is given in **Table 3-9.**

Table 3-8 Analytical Methods for Analysis of Ambient Air Quality Parameters

S. No	Parameters	Analytical method
1	Sulphur Dioxide (SO_2), µg/m^3	IS 5182(Part 2) : 2001 RA
2	Nitrogen Dioxide (NO_2), µg/m^3	IS 5182(Part 6) : 2006 RA
3	Particulate Matter ($PM_{2.5}$), µg/m^3	SOP – EA -001- In house validated method / Issue No/Date : 03 / 04.08.2014:
4	Particulate Matter (PM_{10}), µg/m^3	IS 5182(Part 23) : 2006 RA
5	CO mg/m^3	NIOSH- 6014
6	Pbµg/m^3	IS 5182(Part 22): 2004 RA
7	O_3, µg/m^3	IS 5182(Part 9): 1974 RA
8	NH_3, µg/m^3	SOP – EA -009 - In house validated method / Issue No/Date: 03/04.08.2014 (Based on CPCB Method)
9	Benzene, µg/m^3	IS 5182(Part 11): 2006 (RA 2012)
10	Benzo (a) pyrene, ng/m^3	IS 5182(Part 12) :2004 RA
11	Arsenic, ng/ m^3	SOP – EA -010 - In house validated method / Issue No/Date :03/04.08.2014 (Based on CPCB Method)
12	Nickel ng/ m^3	SOP – EA -011 - In house validated method / Issue No/Date :03/04.08.2014 (Based on CPCB Guideline)
13	TVOC	USEPA Method

Table 3-9 Summary of the average baseline concentrations of pollutants

Parameters	Conc.	NAAQ Standards	Locations							
			Tiyarnadurgam	Irutalam	Anusonai	Near Project Site	Kudur	Near Denkanikota	Hosa halli	Kelamangalam
			AAQ 1	AAQ 2	AAQ 3	AAQ 4	AAQ 5	AAQ 6	AAQ 7	AAQ 8
PM_{10} Conc. (µg/m³)	Min.	100 (24 Hours)	37.2	43.2	43.5	42.0	39.7	47.4	40.6	45.2
	Max		53.1	61.5	62.0	59.9	56.6	67.6	57.8	64.4
	Avg.		**44.7**	**51.8**	**52.2**	**50.4**	**47.7**	**56.9**	**48.7**	**54.2**
	98th 'tile		52.8	61.2	61.6	59.5	56.3	67.2	57.5	64.0
$PM_{2.5}$ Conc. (µg/m³)	Min.	60 (24 Hours)	20.5	23.7	23.9	23.1	21.9	26.1	22.3	24.8
	Max		29.2	33.8	34.1	32.9	31.2	37.2	31.8	35.4
	Avg.		**24.6**	**28.5**	**28.7**	**27.7**	**26.2**	**31.3**	**26.8**	**29.8**
	98th 'tile		29.0	33.6	33.9	32.7	31.0	37.0	31.6	35.2
SO_2 Conc. (µg/m³)	Min.	80 (24 Hours)	5.8	6.8	7.7	6.0	6.3	8.9	5.1	8.0
	Max		8.2	9.8	10.9	8.6	8.9	12.6	7.3	11.4
	Avg.		**6.9**	**8.2**	**9.2**	**7.2**	**7.5**	**10.6**	**6.1**	**9.6**
	98th 'tile		8.2	9.7	10.9	8.5	8.9	12.5	7.2	11.4
NO_2 Conc.(µg/m³)	Min.	80 (24 Hours)	15.8	18.9	19.3	16.4	14.6	21.7	19.9	20.5
	Max		30.2	26.9	27.5	23.3	20.8	30.9	28.3	29.3
	Avg.		**18.9**	**22.6**	**23.1**	**19.6**	**17.5**	**26.0**	**23.8**	**24.6**
	98th 'tile		22.4	26.7	27.3	23.2	20.7	30.8	28.2	29.1
CO (mg/m³)	Avg.	4 (1hour)	BDL	BDL	BDL	BDL	BDL	0.36	BDL	0.22

Parameters	Conc.	NAAQ Standards	Locations							
			Tiyarnadurgam	Irutalam	Anusonai	Near Project Site	Kudur	Near Denkanikota	Hosa halli	Kelamangalam
			AAQ 1	AAQ 2	AAQ 3	AAQ 4	AAQ 5	AAQ 6	AAQ 7	AAQ 8
Pb (µg/m^3)	Avg.	1 (24 hour)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O3 (µg/m^3)	Avg.	180 (1hour)	BDL	6.5	8.2	BDL	5.1	13.6	BDL	12.5
NH3 (µg/m^3)	Avg.	400 (24 hours)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene (µg/m^3)	Avg.	5 (Annual)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzo (a) pyrene, (ng/m^3)	Avg.	1 (Annual)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Arsenic (ng/ m^3)	Avg.	6 (Annual)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Nickel (ng/m^3)	Avg.	20 (Annual)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
TVOC (µg/m^3)	Avg.	-	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: BDL (Below detectable limit), DL (Detectable limit)

3.6.6 Interpretations of Results:

The monitoring results of ambient air quality were compared with the National Ambient Air Quality Standards (NAAQS) Prescribed by MoEFCC; GoI Notification dated 16.11.2009. The baseline levels of PM_{10} (37.2 – 67.6 µg/m³), $PM_{2.5}$ (20.5 – 37.2 µg/m³), SO_2(5.1 – 12.6 µg/m³), NO_2(14.6 – 30.9 µg/m³), While thus it was found that concentration of pollutants was within the limits of NAAQ standards.

All the results of ambient air quality parameters have been found within the limit as per NAAQS. Based on comparison study of results for tested parameters with NAAQS, it is interpreted that ambient air quality of studied locations is average. This interpretation narrates to the results found for corresponding locations and study period.

3.7 Noise Environment

The ambient noise level at a location varies continuously depending on the type of surrounding activities. Ambient noise levels have been established by monitoring noise levels at Eight (08) locations in and around 10Km distance from project area during the study period using precision noise level meter. Noise levels were recorded on an hourly basis for one complete day at each location using pre- calibrated noise levels. A map showing the noise monitoring locations is given in**Figure 3-14.**

3.7.1 Results and Discussions

Based on the recorded hourly noise levels at each monitoring location, the day equivalent (Ld) and night equivalent (Ln) were calculated.

- Ld: Average noise levels between 6:00 hours to 22.00 hours.
- Ln: Average noise levels between 22:00 hours to 6.00 hours.

The comparison of day equivalent noise levels (Ld) and night equivalent noise levels (Ln) with the respective CPCB stipulated noise standards for various land use categories are shown in the**Table 3-10**.

Table 3-10 Day and Night Equivalent Noise Levels

S. No	Location	Location Code	Distance (km) from Project boundary	Azimuth Direction	Noise level in dB(A) Leq		CPCB Standard		Environmental Setting
					Day	Night	Lday (Ld)	LNight (Ln)	
1	Tiyarnadurgam	N1	6.8	NE	49.6	40.3	55	45	Residential
2	Irutalam	N2	4	ENE	51.2	43.5	55	45	Residential
3	Anusonai	N3	2.84	ENE	52.5	41.5	55	45	Residential
4	Near Project Site	N4	0.16	ESE	51.5	42.8	75	70	Industrial
5	Kudur	N5	4.3	ESE	52.7	41.4	55	45	Residential
6	Near Denkanikota	N6	8.79	WSW	53.6	43.6	55	45	Residential
7	Hosahalli	N7	2.59	W	48.5	39.6	55	45	Residential
8	Kelamangalam	N8	4.53	NNW	54.0	44.2	55	45	Residential

3.7.2 Interpretations of Results:

The observations of day equivalent and night equivalent noise levels at all locations are given below

- In Industrial areas daytime noise levels were about 51.5 dB(A) and 42.8 dB(A) during nighttime, which is within prescribed limit by CPCB (75 dB(A) Day time & 70 dB(A) Nighttime).
- In residential areas daytime noise levels varied from 48.5 dB(A) to 54.0 dB(A) and nighttime noise levels varied from 39.6 dB(A) to 44.2 dB(A) across the sampling stations. The field observations during the study period indicate that the ambient noise levels are well within the prescribed limit by CPCB (55 dB(A) Day time & 45 dB(A) Nighttime).

The Noise levels recorded during the daytime (6:00 a.m to 10:00 p.m) and night-time (10:00 p.m to 6:00 a.m) at all stations are within the CPCB limits. The major source of noise in the study area is transportation and vehicular movement.

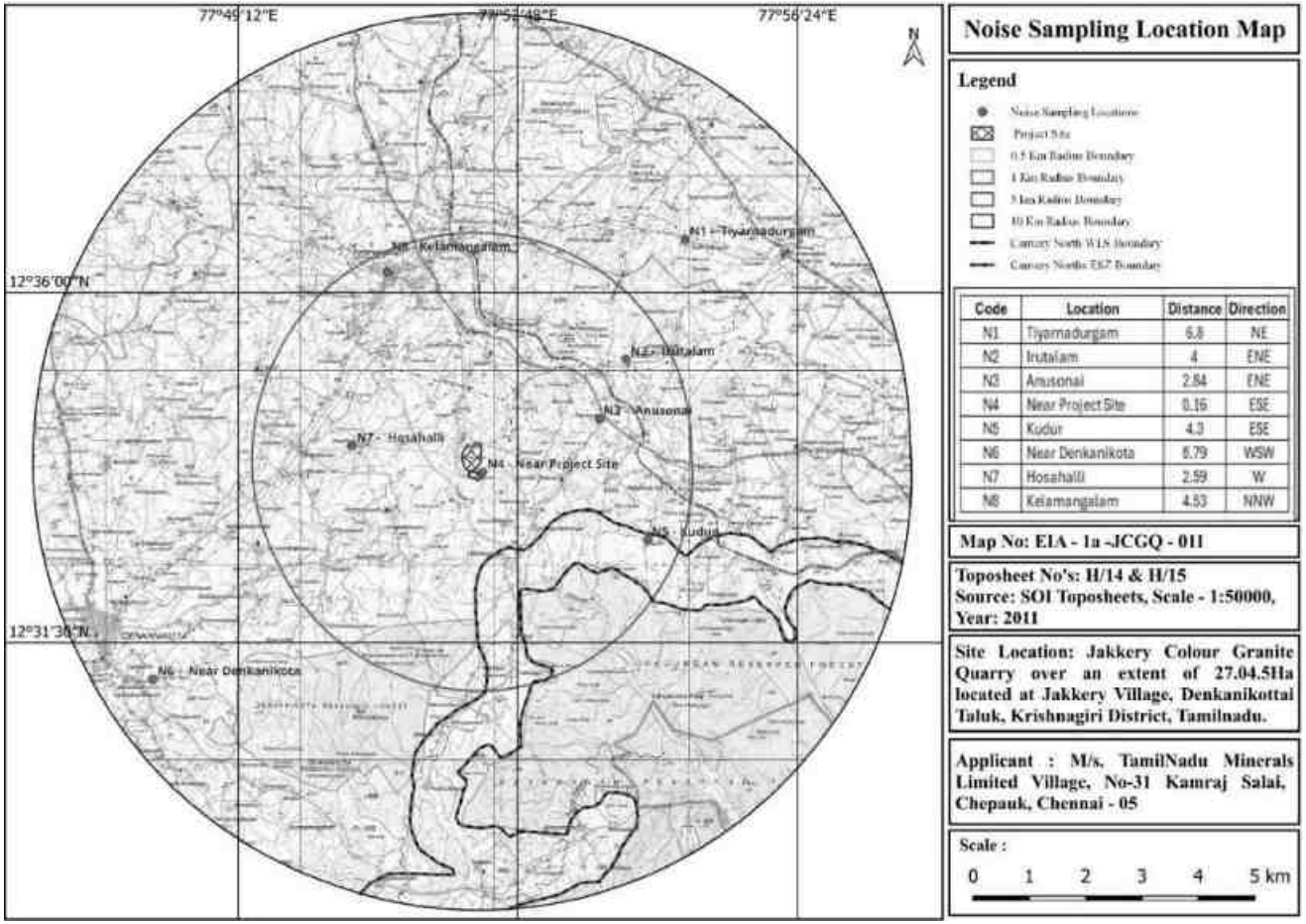


Figure 3-14Noise Monitoring locations

3.8 Water Environment

3.8.1 Surface Water Resources of PIA district

The chief irrigation sources in the district are dug wells, tanks, canals and bore wells. Dug well irrigation is highest in Uthangarai block followed by Kaveri Pattanam. Highest canal and tank irrigation are seen in Kaveripattinam and Krishnagiri respectively. Krishnagiri district forms parts of Cauvery and East Coast Minor Rivers basins. Cauvery River forms the southwestern boundary of the district. Dodda Halla is the most important tributary of Cauvery draining the rugged terrain in the northwestern part of the district. Ponnaiyar is the major river draining the district and is ephemeral in nature.

Source: ***http://cgwb.gov.in/district_profile/tamilnadu/krishanagiri.pdf***

3.8.2 Surface Water Quality Assessment

To establish the baseline status of water environment, the representative sampling locations for surface water within a radial distance of 10 Km from project site have been selected as per CPCB guidelines of Water Quality Monitoring through an adequate survey of the project area. Test methods used for the analysis of water quality parameters is given in **Table 3-11**.

Table 3-11 Test methods used for the analysis of water quality parameters

S. No	Parameter Measured	Test Method
1	Turbidity	APHA 23rd Edition 2017 /2130B/P 2-9 Nephelometric Method/ IS 3025(Part 10): 1984 RA
2	Color	APHA 23rd Edition 2017 2120B /P2-2 Visual Comparison Method / IS 3025(Part 4) : 1983 RA
3	pH	APHA 23rd Edition 2017 4500 H+ / P 4-90 Electrometric Method/IS 3025(Part 11): RA
4	Conductivity	APHA 23rd Edition 2017/ 2510 B /P 2 – 47 Electrometric Method/IS3025(Part 14): 2013 RA
5	Total Dissolve Solids	APHA (23rd Edition) 2017/ 2540 C / P 2-58 Gravimetric Method/IS 3025 (part 16) :1984 RA
6	Total Suspended Solids	APHA 23rd Edition 2017/ 2540 D /2 -58 / IS 3025(Part 17) : 1984 (RA 2012) Gravimetric Method
7	Alkalinity as $CaCO_3$	APHA 23rd Edition 2017/2320 B / P 2 – 27 Titrimetric Method/IS3025(Part 23) : 1986 RA
8	Total Hardness as $CaCo_3$	APHA 23rd Edition 2017 /2340 C / P 2 – 37 EDTA Titrimetric Method/IS 3025(Part 21) : 2009 RA
9	Sodium	APHA 23rd Edition 2017/ 3500 Na B / P 3-98 Flame Emission Photometric Method/IS 3025(Part 45): 1993 RA
10	Potassium	APHA 23rd Edition 2017/ 3500 K B / P 3-98 Flame Emission Photometric

S. No	Parameter Measured	Test Method
		Method/IS 3025(Part 45): 1993 RA
11	Calcium as Ca	APHA 23rd Edition 2017 3500 Ca B /P 3-65 Calculation Method /IS 3025(Part 40): 1991 RA
12	Magnesium as Mg	IS 3025(Part 46): RA /APHA 23rd Edition 2017 2340 C / P 3-84 Calculation Method
13	Chloride	IS 3025(Part 32): 1988 / APHA 23rd Edition 2017 4500 Cl- B / P 4-70 Argenometric Method
14	Sulphate SO_4	APHA 23rd Edition 2017 4500 SO42- E / P 4-188 Turbidity Method/IS 3025(Part 24) : 1986 RA
15	Nitrate as NO_3	APHA 23rd Edition 2017 4500 NO3 B Ultraviolet Spectro Photometric Screening Method
16	Phosphate	IS 3025 Part 31: 1988 Chapter 12
17	Fluorides as F	APHA23rd Edition F-D: 2017
18	Cyanide	APHA 23rd Edition 2017 4500- CN- E/ P 4-42 Calorimetric Method
19	Arsenic	APHA 23rd Edition 2017 3500- As / P 3-61 Silver Diethyldithiocarbamate Method
20	Boron	APHA 23rd Edition 2017 :4500 BB/P4-23
21	Cadmium	IS 3025 (Part - 41)1991
22	Chromium, total	IS 3025(Part 52) RA / APHA 23rd Edition 2017/3500 Cr / P 3- 67 1,5Diphenylcarbazide Method
23	Copper	APHA 23rd Edition 2017 3500 Cu B/P 3-72 Atomic Absorption Spectrometric Method / IS 3025(Part 42): 1992 RA
24	Iron	APHA 23rd Edition 2017 3500 Fe- B/ P 3-77 1,10 Phenanthroline Method /IS 3025(Part 53): 2003 RA
25	Lead	APHA 23rd Edition 2017 3500 Pb B / P 3 -80 Atomic Absorption Spectrometric Method / IS 3025(Part 47): 1994 RA
26	Manganese	IS 3025(Part 46): RA /APHA 23rd Edition 2017 2340 C / P 3-84Calculation Method
27	Mercury	IS 3025 (Part48):1994 RA 1999
28	Nickel	IS 3025:(Part-54):2003(Reaff 2009)
29	Selenium	IS 3025 Part (56)2003
30	Zinc	APHA 22rd Edition 2017/ 3500 Zn B / P 3 – 106 Atomic Absorption Spectrometric Method/IS 3025(Part 49) : 1994 RA
31	Dissolved Oxygen	IS:3025 (Part - 38)1989 (Reaff 2009)
32	BOD at 27Â°C for 3 days	IS:3025 (Part – 58): 2006
33	COD	IS:3025 (Part – 44): 1993

Classification of Surface Standard- IS 2296:

Class A – Drinking water without conventional treatment but after disinfection.

Class B – Water for outdoor bathing.
Class C – Drinking water with conventional treatment followed by disinfection.
Class D – Water for fish culture and wildlife propagation.
Class E – Water for irrigation, industrial cooling, and controlled waste disposal

The prevailing status of surface water quality has been assessed during the study period. Surface water sampling Locations and Its results are given in **Table 3-12** and **Table 3-13** respectively. A map showing the surface water monitoring locations is given in **Figure 3-15**.

Table 3-12 Details of Surface water sampling locations

S. No	Water bodies	Location code	Longitude	Latitude	Distance from project boundary (~Km)	Direction from project boundary
1	Lake near Kelamangalam	SW1	77.86484802	12.61626785	5.48	N
2	Lake near Vanagiri	SW2	77.86796847	12.57591541	1.04	N
3	Near Tiyarnaourgam	SW3	77.91370506	12.61754897	7.18	NE
4	Lake near Nagamangalam	SW4	77.94471265	12.56370358	7.89	E
5	Chinnar River d/s	SW5	77.8807168	12.54544716	1.86	SSE
6	Lake near Puvanpalli	SW6	77.84589915	12.55070243	2.85	WSW
7	Chinnar River u/s	SW7	77.85103749	12.58258664	2.61	NW
8	Lake near Kelamangalam	SW8	77.85918281	12.5984349	3.62	NNW

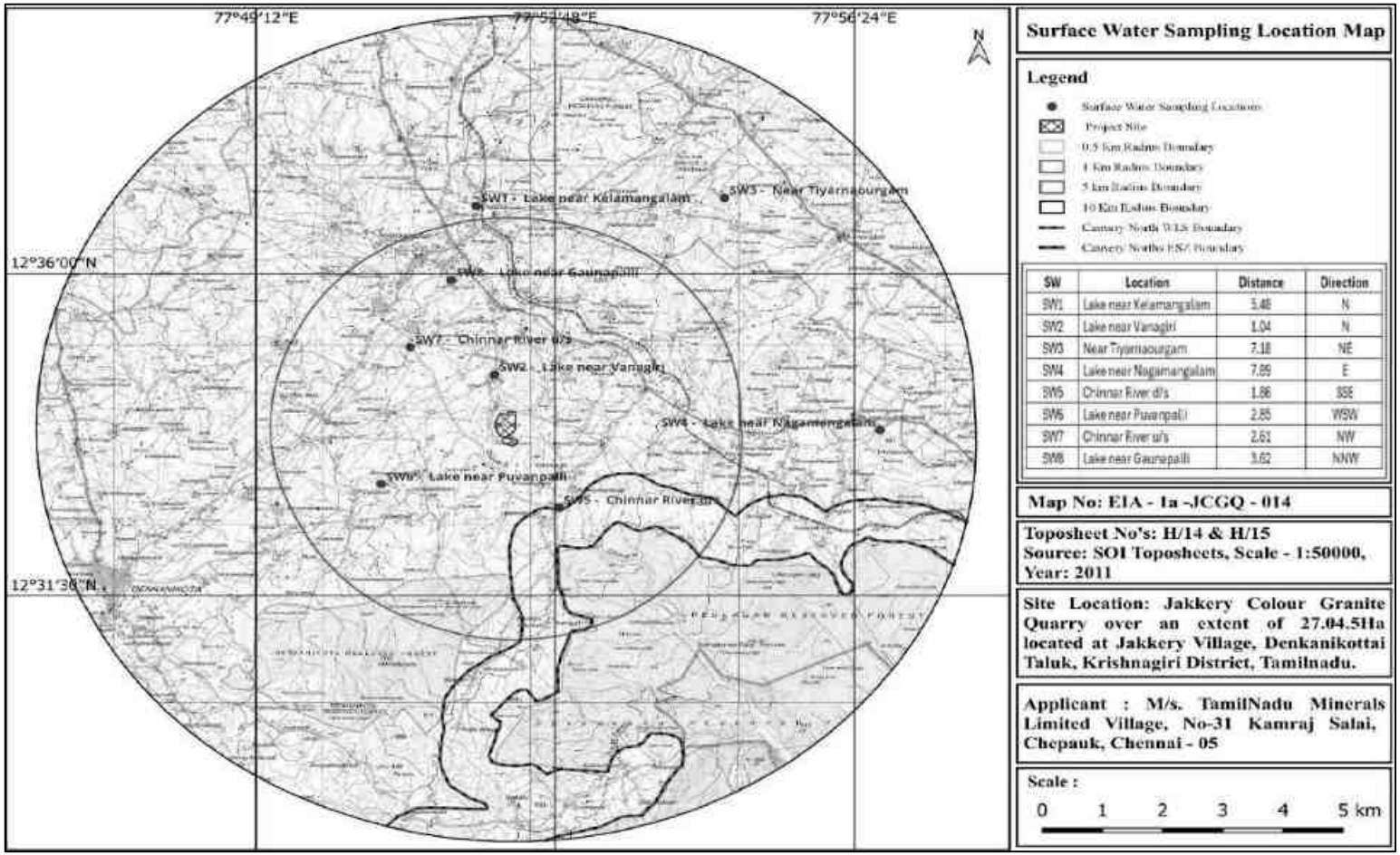


Figure 3-15 Surface water monitoring locations

Table 3-13 Surface water Monitoring Results

S. No	Parameter	Unit	Surface water standards (IS 2296 Class-A)	Lake near Kelamangalam	Lake near Vanagiri	Near Tiyarnaourgam	Lake near Nagamangalam	Chinnar River d/s	Lake near Puvanpalli	Chinnar River u/s	Lake near Gaunapalli
				SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW7	SW8
1	Turbidity	NTU	1	3.2	4.1	1.1	1.1	1.1	2.4	1.3	3.5
2	pH (at 25°C)	--	6.5-8.5	7.22	7.85	7.12	7.46	7.25	7.42	7.36	7.85
3	Electrical Conductivity	µS/cm	-	811	989	725	908	859	625	721	1100
4	Total Dissolved Solids	mg/l	500	519	621	465	586	554	403	456	710
5	Total Suspended Solids	mg/l	-	13.8	15.1	11.1	10.8	8.5	18.6	7.2	21.1
6	Total Alkalinity as $CaCO_3$	mg/l	-	197.2	236.0	176.9	222.6	210.5	153.0	173.4	269.6
7	Total Hardness as $CaCO_3$	mg/l	300	218.0	260.9	209.5	263.5	249.3	181.1	205.4	319.3
8	Sodium as Na	mg/l	-	77.0	92.2	69.1	93.1	94.0	59.7	59.3	114.4
9	Potassium as K	mg/l	-	19.3	23.0	17.3	23.3	23.5	14.9	14.8	28.6
10	Calcium as Ca	mg/l	-	44.9	60.9	44.9	56.1	51.3	40.1	44.9	72.1
11	Magnesium as Mg	mg/l	-	25.3	26.3	23.3	30.2	29.2	19.5	22.4	34.0
12	Chloride as Cl	mg/l	250	145	174	130	176	177	113	114	220
13	Sulphate as SO_4	mg/l	400	36.3	43.5	32.6	35.1	35.5	28.2	28.5	55.0
14	Nitrate as NO_3	mg/l	20	9.8	10.1	8.2	7.2	7.6	8.5	6.3	12.5
15	Phosphate as PO_4	mg/l	-	0.31	0.18	0.12	0.32	0.052	0.38	0.065	0.445
16	Fluorides as F	mg/l	1.5	0.55	0.15	0.32	0.36	0.55	0.31	0.43	0.41

17	Cyanide	mg/l	0.05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
18	Arsenic	mg/l	0.05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19	Boron as B	mg/l	-	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20	Cadmium as Cd	mg/l	0.01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21	Chromium, Total	mg/l	0.05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22	Copper as Cu	mg/l	1.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23	Iron as Fe	mg/l	0.3	0.26	0.18	0.045	0.25	0.065	0.21	0.051	0.28
24	Lead as Pb	mg/l	0.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
25	Manganese as Mn	mg/l	0.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26	Mercury	mg/l	0.001	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27	Nickel as Ni	mg/l	-	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28	Selenium as Se	mg/l	0.01	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29	Zinc	mg/l	15	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
30	Dissolved Oxygen	mg/l	6	5.7	5.7	6.1	5.8	6	5.9	6.2	5.5
31	Chemical Oxygen Demand as O_2	mg/l	-	32.5	36.1	24.6	36.8	28.5	28.6	24.6	40.5
32	BOD, 3 days @ 27°C as O_2	mg/l	2	3.5	4.1	1.1	2.8	3.8	2.1	3.5	4.5

Note: *BDL- Below Detectable Limit*

Interpretations of Results:

The surface water results were compared with IS 2296:1992 standard and in respect of CPCB water Quality Criteria for designated best use. Based on comparison study of test results with Surface water Quantity Standards (Is 2296 Class A), it is interpreted that water qualities of studied locations are classified under Class E, which can be used for irrigation industrial cooling, and controlled waste disposal.

- The pH value ranges from 7.12 to 7.85 and within the limits (6.5 – 8.5) of IS 2296:1992.
- The Electrical Conductivity (EC) of the collected surface water ranges from 625 µS/cm to 1100 µS/cm.
- The chloride content in the collected surface water ranges from 113 mg/l to 220 mg/l.
- The sulphate content in the collected surface water sample ranges from 28.2 mg/l to 55.0 mg/l.
- The Total hardness of the collected surface water sample ranges from 108.8 mg/l to 240.7 mg/l.
- COD of the collected surface water sample ranges from 24.6 mg/l to 40.5 mg/l.
- BOD of the collected surface water sample ranges from 1.1 mg/l to 4.5 mg/l.

3.8.3 Ground Water Quality

Total **Eight (08)** ground water monitoring locations were identified for assessment in different villages around the project site. The groundwater results are compared with the acceptable and permissible water quality standards as per IS: 10500 (2012) for drinking water. Groundwater quality monitoring locations and results are given in **Table 3-14** and **Table 3-15**respectively. A map showing the groundwater monitoring locations is given in**Figure 3-16**.

Table 3-14 Details of Groundwater Quality Monitoring Locations

Station Code	Location	Longitude	Latitude	Distance (~km) from Project boundary	Azimuth Directions
GW1	Tiyarnadurgam	77.91588621	12.6109526	6.8	NE
GW2	Irutalam	77.84751834	12.57310363	4	ENE
GW3	Anusonai	77.89786015	12.573019	2.84	ENE
GW4	Near Project Site	77.87273332	12.56157117	0.16	ESE
GW5	Kudur	77.90780113	12.54712686	4.3	ESE
GW6	Near Denkanikota	77.80167954	12.51707963	8.79	WSW
GW7	Hosahalli	77.84449325	12.56727775	2.59	W
GW8	Kelamangalam	77.85195034	12.60446697	4.53	NNW

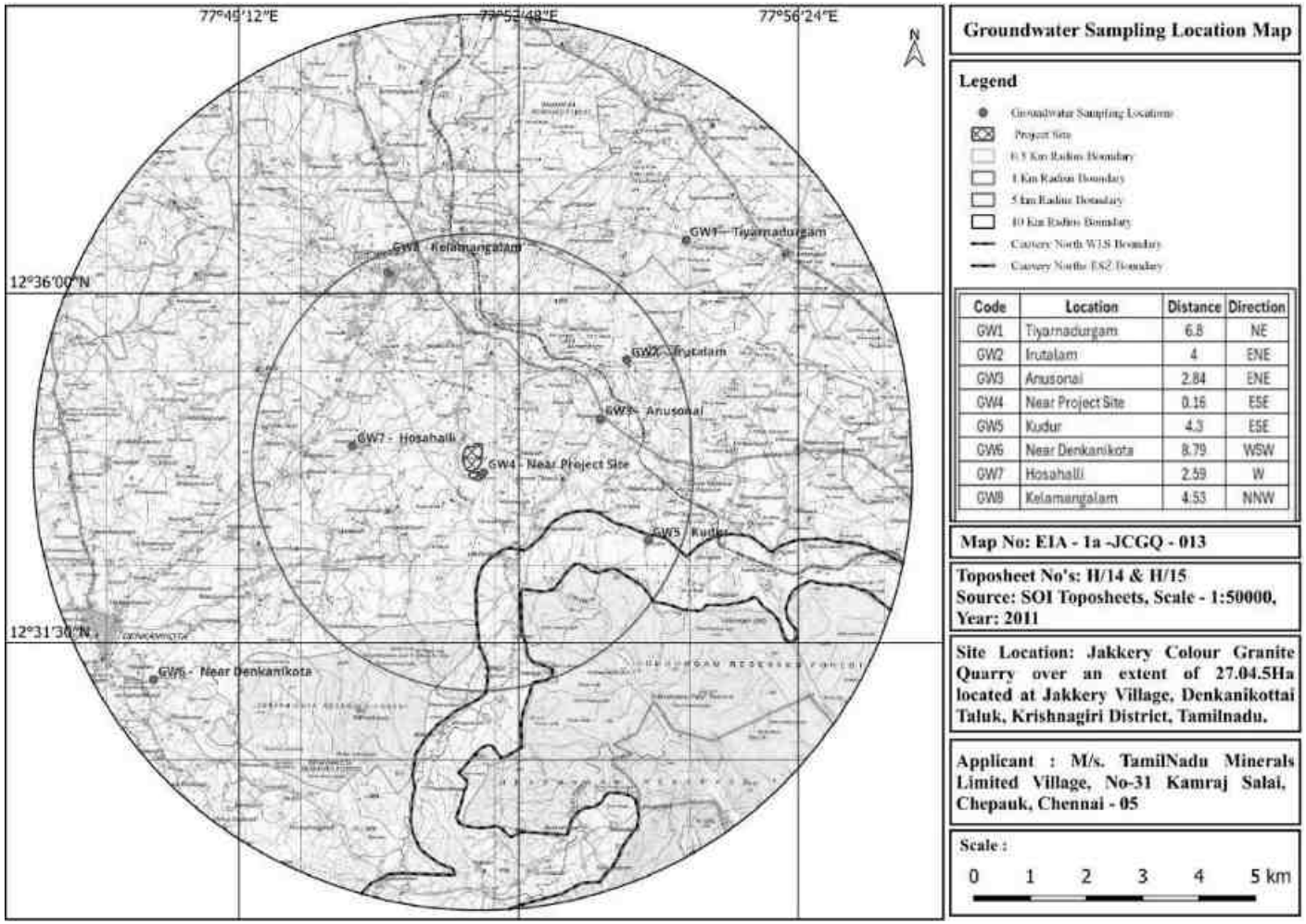


Figure 3-16 Groundwater monitoring locations

Table 3-15 Ground Water Monitoring Results

S. No	Parameters	Unit	Drinking water Standard (IS 10500: 2012) Acceptable Limit	Drinking water Standard (IS 10500: 2012) Permissible Limit	Tiyarnadurgam	Irutalam	Anusonai	Near Project Site	Kudur	Near Denkanikota	Hosahalli	Kelamangalam
					GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
1	Colour	Hazen	5	15	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2	Turbidity	NTU	1	5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
3	pH	--	6.5-8.5	NR	7.25	7.18	7.58	7.41	7.22	7.38	7.68	7.36
4	Conductivity	µS/cm	-	-	988	716	855	981	865	1025	848	1138
5	Total Dissolve Solids	mg/l	500	2000	625	439	532	628	528	651	553	728
6	Total Suspended Solids		-	-	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
7	Alkalinity as $CaCO_3$	mg/l	200	600	194	154	165	195	164	202	194	226
8	Total Hardness as $CaCO_3$	mg/l	200	600	238	228	239	239	201	247	232	277
9	Sodium as Na	mg/l	-	-	92.8	51.6	71.5	93.2	78.3	110.4	90.8	108.1
10	Potassium as K	mg/l	-	-	23.2	12.9	17.9	23.3	19.6	27.6	22.7	27.0
11	Calcium as Ca	mg/l	75	200	49.7	51.3	51.3	54.5	44.9	52.9	51.3	59.3
12	Magnesium as Mg	mg/l	30	100	27.2	24.3	27.2	25.3	21.4	28.2	25.3	31.1
13	Chloride as Cl	mg/l	250	1000	175	123	170	176	148	208	171	204
14	Sulphate SO_4	mg/l	200	400	43.8	30.7	42.5	43.9	36.9	52.1	42.8	51.0
15	Nitrate as NO_3	mg/l	45	NR	7.2	6.1	5.5	6.6	7.3	6.8	5.8	7.8

S. No	Parameters	Unit	Drinking water Standard (IS 10500: 2012) Acceptable Limit	Drinking water Standard (IS 10500: 2012) Permissible Limit	Tiyarnadurgam	Irutalam	Anusonai	Near Project Site	Kudur	Near Denkanikota	Hosahalli	Kelamangalam
					GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8
16	Phosphate PO4	mg/l	-	-	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17	Fluorides as F	mg/l	1	1.5	0.32	0.41	0.28	0.21	0.38	0.43	0.33	0.48
18	Cyanide	mg/l	0.05	NR	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
19	Arsenic as As	mg/l	0.01	0.05	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
20	Boron as B	mg/l	0.5	1.0	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
21	Cadmium as Cd	mg/l	0.003	NR	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
22	Chromium as Cr	mg/l	0.05	NR	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
23	Copper	mg/l	0.05	1.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
24	Iron	mg/l	0.3	NR	0.22	0.18	0.26	0.18	0.2	0.19	0.28	0.36
25	Lead	mg/l	0.01	NR	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26	Manganese as Mn	mg/l	0.1	0.3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
27	Mercury	mg/l	0.001	NR	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
28	Nickel as Ni	mg/l	0.02	NR	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
29	Selenium as Se	mg/l	0.01	NR	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
30	Zinc as Zn	mg/l	5		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Note: *BDL- Below Detectable Limit; NR-No Relaxation*

Interpretations of Results:

Physio-chemical characteristics of ground water samples collected from the selected villages. The Ground water results were compared with drinking water standards (IS 10500:2012).

- The ground water results of the study area indicate that the pH range varies between 7.18 and 7.68. It is observed that the pH range is within the limit of IS 10500:2012.
- The Total Dissolved Solids range varies between 439 mg/l – 728 mg/l for the ground water. All the samples are well within the permissible limit of IS 10500: 2012.
- The acceptable limit of the chloride content is 250 mg/l and permissible limit is 1000 mg/l. The chloride content in the ground water for study area ranges between 123 mg/l – 208 mg/l. It is observed that all are well within the Permissible Limit and Acceptable Limit of IS 10500:2012.
- The desirable limit of the sulphate content is 200 mg/l and permissible limit is 400 mg/l. The sulphate content of the ground water of the study area varies between 30.7 mg/l – 52.1 mg/l. It is observed that all the samples are within the Acceptable Limit and permissible limit of IS 10500: 2012.

Based on comparison study of test results with drinking water standard, it is interpreted that water qualities of studied locations meet with the drinking water standards as per IS 10500: 2012 Permissible Limit. These interpretations relate to the sample tested for location only. To prevent ground water contamination and improving the quality and Quantity, rainwater harvesting, and groundwater recharging may be helpful.

3.9 Soil quality

Eight locations in and around the proposed project were selected for soil sampling. At each location, soil samples were collected from three different depths viz. 30 cm, 60 cm and 90 cm below the surface. Soil analysis was carried out as per IS: 2720 methods. The methodology adopted for each parameter is described in. Soil quality monitoring locations & results are given in **Table 3-17** & **Table 3-18.** Map showing the soil monitoring locations is given in **Figure 3-17.**

Table 3-16 Test methods used for the analysis of Soil

S. No	Parameter Measured	Test Method
1	pH @ 25°C	IS 2720 (Part 26): 1987
2	Electrical Conductivity	IS 14767: 2000
3	Nitrogen as N	IS 14684: 1999 / FAO 2007 RA
4	Phosphorus	IS 14684: 1999 RA
5	Potassium	FAO-UN 2007 RA
6	Organic Carbon/ Organic Matter	IS 2720 (Part 22): 1972
7	Cation Exchange Capacity	SOP No. CB/CL/SOP/S- 9 by Calculation Method

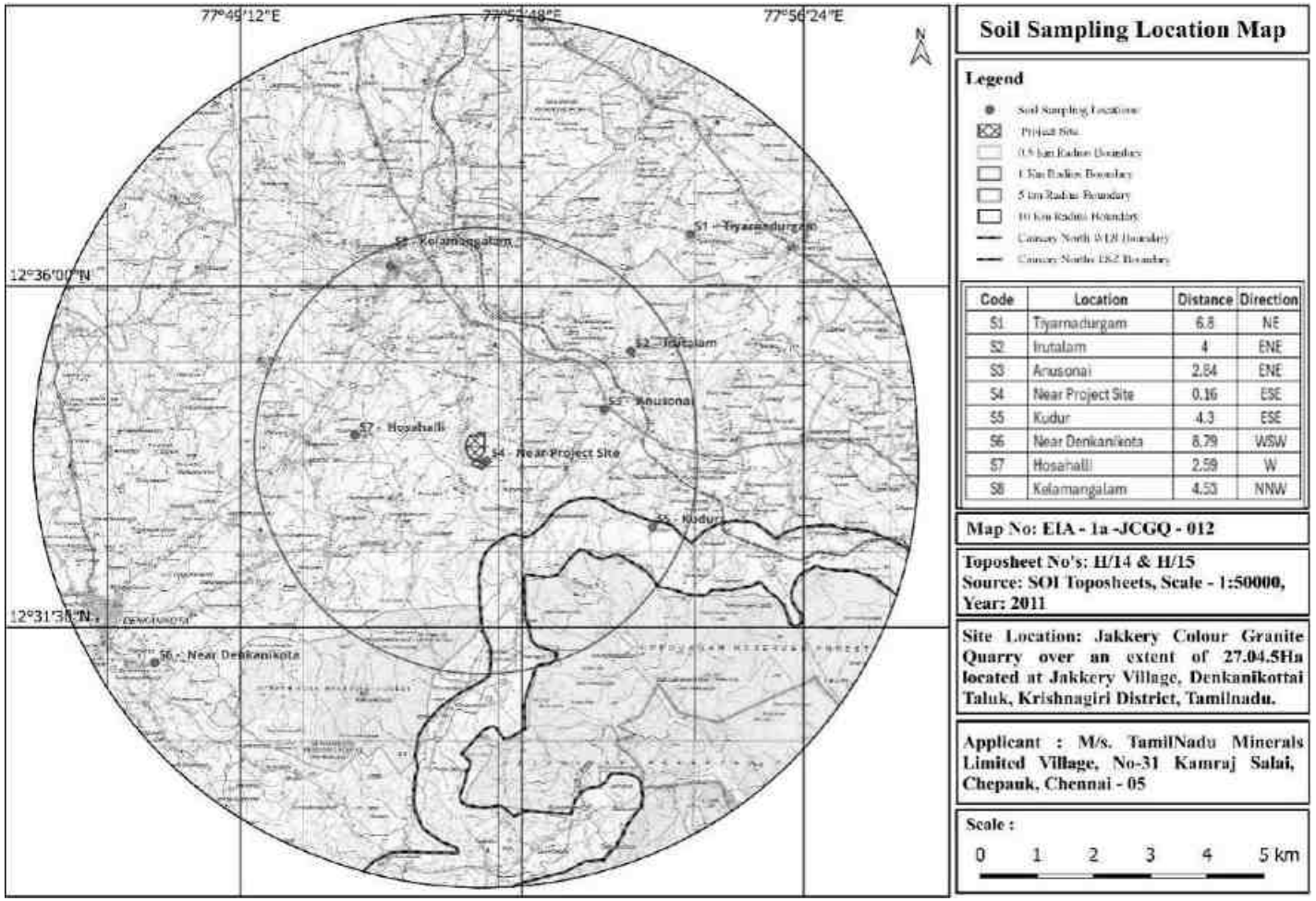


Figure 3-17 Soil monitoring locations

Table 3-17 Soil & Sediment Quality Monitoring Locations

Location Code	Location	Distance (Km) w.r.t project site	Longitude	Latitude	Direction w.r.t project site
S1	Tiyarnadurgam	6.80	77.91588621	12.6109526	NE
S2	Irutalam	4.00	77.84751834	12.57310363	ENE
S3	Anusonai	2.84	77.89786015	12.573019	ENE
S4	Near Project Site	0.16	77.87273332	12.56157117	ESE
S5	Kudur	4.30	77.90780113	12.54712686	ESE
S6	Near Denkanikota	8.79	77.80167954	12.51707963	WSW
S7	Hosahalli	2.59	77.84449325	12.56727775	W
S8	Kelamangalam	4.53	77.85195034	12.60446697	NNW

Table 3-18 Soil & Sediment Quality Monitoring Results

S. No	Parameters	Units	Tiyarnadurgam	Irutalam	Anusonai	Near Project Site	Kudur	Near Denkanikota	Hosahalli	Kelamangalam
			S1	S2	S3	S4	S5	S6	S7	S8
1	Sand	%	48.5	52.1	33.5	35.5	54.1	54.1	51.1	31.2
2	Silt	%	20.8	17.8	45.5	18.6	13.2	19.3	16.8	18.2
3	Clay	%	30.7	30.1	21.0	45.9	32.7	26.6	32.1	50.6
4	pH	-	7.54	7.45	7.77	6.99	7.22	7.55	7.15	7.15
5	Electrical conductivity	µmhos/cm	148	245	251	144	245	385	138	138
6	Nitrogen as N	Kg/ha	82	76	135	122	96	71	92	141
7	Phosphorus	Kg/ha	16	18	22	15	19	24	20	25
8	Potassium	Kg/ha	58	61	81	78	86	72	91	85
9	Cation Exchange Capacity	meq/100 gm	6.1	11.6	0.9	13.2	6.8	3.7	6.2	15.8
10	Organic Carbon	%	0.342	0.255	0.255	0.211	0.255	0.255	0.188	0.288
11	Organic matter	%	0.590	0.440	0.440	0.364	0.440	0.440	0.324	0.497

The soil characteristics are compared with ICAR (Indian Council of Agricultural research):

S. No	Parameters	Units	Tiyarna durgam	Irutalam	Anusonai	Near Project Site	Kudur	Near Denkanikota	Hosahalli	Kelamangalam
			S1	S2	S3	S4	S5	S6	S7	S8
1	pH	-	Slightly Alkaline	Slightly Alkaline	Slightly Alkaline	Neutral	Neutral	Slightly Alkaline	Neutral	Neutral
2	Electrical conductivity	µmhos /cm	Average	Average	Average	Average	Average	Average	Average	Average
3	Nitrogen as N	Kg/ha	Less	Less	Good	Good	Less	Less	Less	Good
4	Phosphorus	Kg/ha	Less	Less	Less	Very Less	Less	Less	Less	Less
5	Potassium	Kg/ha	Very Less	Very Less	Very Less	Very Less	Very Less	Very Less	Very Less	Very Less

Interpretations of Results:

Summary of analytical results

- The pH of the soil samples ranged from 6.99 to 7.77 Indicating that the soils are slightly acidic to moderately alkaline in nature.
- Conductivity of the soil samples ranged from 138 µmhos/cm to 385 µmhos/cm.
- Nitrogen content ranged from 71 kg/ha to 141 kg/ha.
- Phosphorous ranged from 15 kg/ha to 25 kg/ha.
- Potassium content ranges from 58 kg/ha to 91 kg/ha.

3.10 Biological Environment

3.10.1 Natural Resources

Krishnagiri is one among the districts of Tamil Nadu, which with natural resources having 2,024 Sq. Kms of forest cover is its unique feature. The hill ranges of this district are called by the name 'Melagiri'. The major type of forest seen here are Tropical, Deciduous forests, thorny shrubs and bamboo forest. Dense forest covers Denkanikottai region. The other region contains shrubs, hills and hillocks with bushes.

3.10.2 Flora and Fauna

The major wild animals include Elephants, Sambar, Spotted Deer, Gaur, Wild boar, Panther etc. The forest area of Denkanikottai Taluk forms the prime elephant habitat with lot of bamboos and this area constitutes the Cauvery elephant reserve, which is constituted over and area of about 450 Sq. Kms. The bird population is also attractive with beautiful birds like Paradise flycatcher. Big lakes in Anchetti and Hosur areas also attract large number of migratory birds like Painted storks, Teals etc. Apart from these birds and mammals, there are variety of butterflies, giant spiders etc. that are coming under endangered list. Kodakkarai shoal forest in Denkanikottai Taluk is known for large scale migratory butterflies during a particular season then one can observe thousands of migratory butterflies passing through this forest like a passing cloud.

The district is a paradise for natural lovers. The flora includes variety of timber trees like Rose wood, Teak, Sandal etc. Hundereds of medicinal herbs, minor forest plants like nelli, kadukkai, cheekai, pungam etc. The following trees are like 'Charakkonnai' ('Cassia histula'). Since pungam trees are found in abundance in this forest pungam oil is extracted from these seeds of this tress which is a non-pollutant Biofuel.

Source:*https://krishnagiri.nic.in/about-district/district-at-a-glance/*

Biodiversity is an ecological study of the ecosystem and is essential to understand the impact of industrialization and urbanization on existing flora and fauna of the study area. Studies on various aspects of ecosystem play an important role in identifying sensitive issues for undertaking appropriate action to mitigate the impact, if any. The biological study was undertaken as a part of the EIA study report to understand the present status of ecosystem prevailing in the study area, to compare it with past condition with the help of available data, to predict changes in the biological environment as a result of present activities and to suggest measures for maintaining its health. Secondary source information has been conducted to

study the flora & fauna in 10 km radius. Some of the information was gathered from the local habitants. The entire secondary data were classified to interpret the impact of pollution on the flora and fauna of that region. A Survey of the wild plants as well as cultivated crop plants was made, and all the available information was recorded.

During the collection of secondary information, following aspects were considered for ecological studies:

- Assessment of present status of flora and fauna.
- Identification of rare and endangered species of plants and animals (if any)
- Identification of ecologically sensitive areas within the study area.
- Assessment of migratory route of wildlife (if any) and
- Assessment of Aquatic Ecology with specific reference to aquatic birds and plankton resources.

Methodology

Terrestrial investigations for flora and fauna records were collected by secondary information like research articles, periodicals, flora and forest checklist.

3.10.3 Flora Assessment

To characterize vegetation of the study area, the primary data was collected and analyzed to describe the properties of vegetation with reference to species composition and structural attributes expressed. The identification of the flora in the radius of 10 km was done based on personal observations, management plan of Forest Division, authentic secondary literature, and in-depth exploration of the entire area. For secondary information based on a total 136 species under different family found in the study area. List of flora reported/observed during the study period are listed in

Table 3-19. There are no rare and endangered species identified in the study area. List of floras in Cauvery North Wildlife Sanctuary is given in the **Table 3-20.**

Table 3-19List of flora reported/observed in the study area

S. No.	Scientific Name	Common Name	Vernacular Name	Occurrence	IUCN Status
Trees					
1	*Albizia saman*	Rain tree	Amaivagai	Native	LC
2	*Areca catechu*	Betel palm	Ataikkay	Native	LC
3	*Artocarpus heterophyllus*	Jackfruit tree	Pala Maram	Native	LC
4	*Azadirachta indica*	Neem	Veppai	Native	LC
5	*Bauhinia purpurea*	Orchid tree	Nilattiruvatti	Native	LC

6	*Borassus flabellifer*	Palm tree	Panaimaram	Native	LC
7	*Callistemon speciosus*	Bottle brush	Palasu	Invasive	LC
8	*Carica papaya*	Papaya tree	Pappali	Native	LC
9	*Caryotaurens*	Fishtail palm	Kontalpanai	Native	LC
10	*Cassia auriculata*	Matura tea tree	Avaram	Native	LC
11	*Citrus limon*	Lemon	Eumichai	Native	LC
12	*Cocos nucifera*	Coconut tree	Tennai	Native	LC
13	*Cordia dichotoma*	Fragrant manjack	naruvili	Invasive	LC
14	*Cordia sebestena*	Geiger tree	Achinaruvili	Invasive	LC
15	*Cupressus macrocarpa*	Monterey cypress	-	Invasive	LC
16	*Delonix regia*	Flame of forest	Mayil kondrai	Native	LC
17	*Dracaena marginata*	Dragon tree	-	Native	LC
18	*Eucalyptus globulus*	Southern blue gum	Karpuramaram	Native	LC
19	*Ficus benghalensis*	Indian Banyan	Alamaram	Native	LC
20	*Ficus benjamina*	Indian fig	nintamaravakai	Native	LC
21	*Ficus elastica*	Rubber fig	-	Native	LC
22	*Ficus racemosa*	Cluster fig	Athi	Native	LC
23	*Lagerstroemia indica*	Common crape myrtle	Pavalakkurinji	Native	LC
24	*Leucaena leucocephala*	Whitelead tree	Periya-takarai	Native	LC
25	*Madhuca longifolia*	Butter tree	Iluppai	Native	LC
26	*Mangifera indica*	Mango	Maamaram	Native	LC
27	*Manilkara zapota*	Sapota	chimaiyiluppai	Native	LC
28	*Melia azedarach*	Indian lilac	Kattuvembhu	Native	LC
29	*Millingtonia hortensis*	Tree jasmine	Maramalli	Native	LC
30	*Mimusopselengi*	Medlar tree	Magizhamboo	Native	LC
31	*Morindapubescens*	Indian Mulberry	Mannanunai	Native	LC
32	*Moringa oleifera*	Drumstick tree	Murungai	Native	LC
33	*Muntingia calabura*	Singapore cherry	Ten pazham	Native	LC
34	*Peltophorumpterocarpum*	Copper pod	Perungkonrai	Native	LC
35	*Phoenix sylvestris*	Sugar date palm	icham	Native	LC
36	*Pithecellobium dulce*	Manila tamarind	Kodukkappuli	Native	LC
37	*Polyalthia longifolia*	False Asoka	Vansulam	Native	LC
38	*Pongamia pinnata*	Indian beech	Nattamalam	Native	LC
39	*Ptychosperma elegans*	Solitaire palm	-	Native	LC
40	*Ravenalamadagascariensis*	Traveller's palm	Visirivazhai	Native	LC
41	*Roystonea regia*	Cuban royal palm	-	Native	LC
42	*Saraca asoca*	Ashoka tree	Ashogamaram	Native	LC
43	*Sterculia foetida*	Java olive tree	Kutiraippitukku	Native	LC
44	*Stereospermumtetragonum*	Yellow snake tree	Punkali	Native	LC
45	*Syzygiumcumini*	Java plum	Nagai	Native	LC

46	*Terminalia cattappa*	Badam tree	Nattuvadumai	Native	LC
47	*Thespesia populnea*	Portia tree	Poovarasu	Native	LC
Shrubs					
48	*Allamanda cathartica*	Golden trumpet	Allamanda	Invasive	LC
49	*Alpinia galangal*	Galangal	Perarathai	Native	LC
50	*Bougainvillea spectabilis*	Great bougainvillea	Kaakitha poo	Native	LC
51	*Caesalpinia pulcherrima*	Peacock flower	Mayilkonrai	Native	LC
52	*Calotropis gigantea*	Calotrope	Erukku	Native	LC
53	*Cestrum diurnum*	Day jasmine	-	Native	LC
54	*Cestrum nocturnum*	Night blooming jasmine	Pavazhamalli	Native	LC
55	*Datura metel*	Devil's trumpet	Karu oomathai	Native	LC
56	*Durantaerecta*	Golden dew drop	Aagayapoo	Native	LC
57	*Ecliptaprostrata*	False daisy	Karisilanganni	Native	LC
58	*Euonymus japonicus*	Japanese spindle	-	Invasive	LC
59	*Euphorbia tithymaloides*	Redbird flower	Kannadikalli	Invasive	LC
60	*Ficus elastica*	Rubber fig	Seemaiaalai	Native	LC
61	*Hamelia patens*	Fire bush	Theepudhar	Native	LC
62	*Hibiscus Rosa sinensis*	Indian Hibiscus	Cembarutti	Native	LC
63	*Ixora coccinea*	Ixora	Vedchi	Native	LC
64	*Jasminum arborescens*	Navamallika	Kattumalligai	Native	LC
65	*Jasminum auriculatum*	Juhi	Uccimalligai	Native	LC
66	*Jasminum officinale*	Common jasmine	Jathi malli	Native	LC
67	*Jasminum polyanthum*	Pink Jasmine	Thalavam	Native	LC
68	*Jasminum sambac*	Arabian jasmine	Gundu malli	Native	LC
69	*Nerium oleander*	Nerium	Arali	Native	LC
70	*Piper longum*	Indian long pepper	Tippili	Native	LC
71	*Plectranthusamboinicus*	Indian borage	Karpuravalli	Native	LC
72	*Plumeria obtusa*	Singapore graveyard flower	Ponnalari	Native	LC
73	*Plumeria rubra*	Temple tree	Sampangi	Native	LC
74	*Pseuderanthemumcarruthersii*	Carruther's false face	-	Native	LC
75	*Punica granatum*	Pomegranate	Madulai	Native	LC
76	*Symphoricarpos orbiculatus*	Coral berry	-	Native	LC
77	*Tecoma capensis*	Cape honey suckle	Velai	Invasive	LC
78	*Tecoma stans*	Trumpet bush	Sonnapatti	Invasive	LC
79	*Valeriana officinalis*	Garden heliotrope	Catamaci	Invasive	LC
80	*Volkameriainermis*	The glory bower	Sangam	Invasive	LC
Herbs					
81	*Acalypha indica*	Indian Acalypha	Kolippuntu	Native	LC
82	*Acalypha wilkesiana*	Copper leaf	Kuppaimeni	Native	LC

83	*Achyranthes aspera*	Chaff flower	Nayuruvi	Native	LC
84	*Allmanianodiflora*	Node flower	Kumattikkirai	Native	LC
85	*Aloe vera*	Indian aloe	Kattralai	Native	LC
86	*Alternanthera sessilis*	Sessile joyweed	Ponnankanni	Native	LC
87	*Amaranthus viridis*	Green amaranth	Kuppaikeerai	Native	LC
88	*Andrographis paniculata*	Green chiretta	Nilavempu	Native	LC
89	*Apludamutica*	Mauritian grass	Moongilpillu	Native	LC
90	*Aristida setacea*	Broom grass	Thudappampillu	Native	LC
91	*Bambusa bamboo*	Bamboo	Moongil	Native	LC
92	*Basella alba*	Indian spinach	Vasalakkirai	Native	LC
93	*Calliandra tergemina*	Powder puff	-	Native	LC
94	*Canna indica*	Indian shot	Kattuvalai	Native	LC
95	*Catharanthus pusillus*	Tiny periwinkle	Chetthai	Native	LC
96	*Catharanthus roseus*	Pink periwinkle	Nithyakalyani	Native	LC
97	*Centella asiatica*	Indian pennywort	Matanti	Native	LC
98	*Chloris barbata*	Swollen finger grass	Cevvarakumpul	Native	LC
99	*Cleome viscosa*	Tick weed	Naikaduku	Native	LC
100	*Cyanodondactylon*	Bermuda grass	Arugam pillu	Native	LC
101	*Cyperus rotundus*	Nut grass	Korai pillu	Native	LC
102	*Dactylocteniumaegyptium*	Egyptian grass	Kavarapillu	Native	LC
103	*Euphorbia heterophylla*	Japanese poinsettia	Paal perukki	Invasive	LC
104	*Gardenia jasminoides*	Cape Jasmine	Parijatham	Native	LC
105	*Hemigraphiscolorata*	Red Ivy	Vadaikutti	Native	LC
106	*Heteropogoncontortus*	Spear grass	Oosipillu	Native	LC
107	*Hymenocallis littoralis*	Beach spider lily	-	Native	LC
108	*Kalanchoe pinnata*	Air plant	Runakkali	Native	LC
109	*Leucas aspera*	Common leucas	Thumbai	Native	LC
110	*Mimosa pudica*	Touch me not plant	Thottaccurungi	Native	LC
111	*Mollugo nudicaulis*	Naked stem carpet weed	Parpadagam	Native	LC
112	*Musa paradisiaca*	Banana	Vaazhai	Native	LC
113	*Ocimumgratissimum*	Clove basil	Vanatulasi	Native	LC
114	*Ocimumtenuiflorum*	Tulsi	Karuntulasi	Native	LC
115	*Phyllanthus amarus*	Gale of the wind	Kilhkainelli	Native	LC
116	*Phyllanthus virgatus*	Seed under leaf	Patar nelli	Native	LC
117	*Portulaca grandiflora*	Moss rose	Pattu rose	Native	LC
118	*Solanum nigrum*	Black nightshade	Manathakkali	Native	LC
119	*Solanum trilobatum*	Pea Eggplant	Thuthuvalai	Native	LC
120	*Sphagneticolatrilobata*	Chinese wedelia	Manjalkarilamkanni	Native	LC
121	*Stylosantheshamata*	Caribbean stylo	-	Native	LC
122	*Tephrosia purpurea*	Wild indico	Kavali	Native	LC

123	*Tradescantia spathacea*	Boat lily	-	Native	LC
124	*Trichodesma indicum*	Indian borage	Kavizhthumbai	Native	LC
Climbers/Creepers					
125	*Asparagus racemosus*	*Satamuli*	*Shatavari*	*Native*	*LC*
126	*Cardiospermum halicacabum*	Balloon plant	Mudakithan	Native	LC
127	*Cayratiapedata*	Birdfoot Grape vine	Panni kodi	Native	LC
128	*Cissus quandrangularis*	Veld grape	Pirandai	Native	LC
129	*Cissus vitiginea*	South indiantreebine	Mutainari	Native	LC
130	*Coccinia grandis*	Ivy gourd	Kovai	Native	LC
131	*Cucumis melo*	Muskmelon	Thumattikai	Native	LC
132	*Dioscorea tomentosa*	Five leaf yam	Noora kizhangu	Native	LC
133	*Evolvolusalsinoides*	Dwarf morning glory	-	Native	LC
134	*Hemidesmus indicus*	Indian sarsaparilla	Nannari	Native	LC
135	*Passiflora foetida*	Bush passion fruit	Siruppunaikkali	Invasive	LC
136	*Tylophora indica*	Indian Ipecac	Avaci	Native	LC

*(**Note:**LC-Least Concern, DD-Data deficient, CR-Critically Endangered, VU-Vulnerable, NA-Not yet assessed, EN-Endangered, NT-Near Threatened, EW- Extinct in the Wild)*

Source:

- Gamble, J.S. and C.E.C. Fischer. 1915-1935. Flora of Presidency of Madras, Adlard and Son, London. pp. 1-3.
- Nair, N.C. and A.N. Henry. 1983. Flora of Tamil Nadu, India.Series 1, Vol. 1, Botanical Survey of India, Southern Circle, Coimbatore. 1-184.
- Henry, A.N., Kumari, G.R. and Chitra, V. (1987) Flora of Tamil Nadu India. Series 1: Analysis. Vol. 2, Botanical Survey of India, Coimbatore.
- Hooker J.D. 1872-1897. Flora of British India. (Vol. 1-7), Ashford: Reeve and Company. 5568 p.
- Henry, A.N., Chithra, V.N. and Balakrishnan, P. (1989) Flora of Tamil Nadu India. Series 1: Analysis. Vol. III. Botanical Survey of India, Coimbatore

Table 3-20List of floras in Cauvery North Wildlife Sanctuary

S. No.	Scientific Name	Common Name	Vernacular Name	Occurrence	IUCN Status
1	*Albizzia amara*	Oil cake tree	Wunja	Native	LC
2	*Acacia leucophloea*	White Bark Acacia	Akamamaram	Native	LC
3	*Zizyphus species*	Jackal Jujube	Suraimullu	Native	LC
4	*Choroxylon swietenia*	Ceylon Satinwood	Varimaram	Native	LC
5	*Azadirachta indica*	Neem	Veppai	Native	LC
6	*Tamarindus indica*	Tamarind	Puli	Native	LC
7	*Vitex altissima*	Peacock Chaste Tree	Mayilai-nocci	Native	LC

8	*Emblica officinalis*	Indian gooseberry	Nelli	Native	LC
9	*Acacia sundre*	Auri	karuvel	Native	LC
10	*Anogeissus latifolia*	Axle Wood Tree	vel-naga-maram	Native	LC
11	*Sapindusemarginatus*	Notched Leaf Soapnut	Ponnankottai	Native	LC
12	*Wrightia tinctoria*	Sweet Indrajao	Paalai	Native	LC
13	*Terminalia chebula*	Chebulic Myrobalan	kaDukkaay	Native	LC
14	*Ziziphus nummularia*	Jhar Beri	Korgodi	Native	LC
15	*Zizyphusxylopyrus*	Kath Ber	Kottai-elandai	Native	LC
16	*Opuntia delleni,*	prickly pear	Chappathikalli	Invasive	LC
17	*Diospyrusmelonoxylon*	Coromandel Ebony	Karai	Native	LC
18	*Cassia auriculata*	Tanner's Cassia	Avaram	Native	LC
19	*Phoenix acaulis*	dwarf date palm	Eechamaram	Native	LC
20	*Dodoneaviscosa*	Hop Bush	Virali	Native	LC
21	*Atractocarpussessilis*	wild jasmine	kaattumalli	Native	LC
22	*Carissa caranda*	Karanda	Kalakkai	Native	LC
23	*Acacia pendata*	Rusty mimosa	Seengai	Native	LC
24	*Solonumpubessens*	Thornless Turkey Berry	Kaattusundaikaai	Native	LC

Source:

- Management of Cauvery Wildlife Sanctuary, Part 1.

https://aranya.gov.in/downloads/CauveryWLS_MgmtPlan.pdf

3.10.4 Fauna Diversity

This area hosts common animals. Indian Dogs, Jungle and Domestic cat, Rhesus macaque, Domestic Cows, Buffaloes, Bullocks, and Goat etc. are found amongst mammals. Indian cobra, bande Kraits and other common snakes, and lizards like garden lizards are commonly found amongst reptiles. Fauna diversity was collected from secondary information and cross check with relevant literatures (Smith 1933-43, Ali and Ripley 1983, Daniel 1983, Prater 1993, Murthy and Chandrasekhar 1988).

3.10.4.1 Bird's species

A total of 59 species belonging to different families have been identified from the Agricultural area. A comparative chart of the total number of bird species belonging to different families along with their feeding preference and abundance are provided in Table 3-21**.**

Table 3-21List of Birds in the study area

S. No	Scientific name	Common name	IUCN status	Nativity	WPA 1972
1	*Acridotheres tristis*	Common myna	LC	Native	-
2	*Aerodramus unicolor*	Indian Swiftlet	LC	Native	-
3	*Alcedo atthis*	Common Kingfisher	LC	Native	-
4	*Amaurornisphoenicurus*	white-breasted waterhen	LC	Native	-
5	*Anastomusoscitans*	Asian openbill stork	LC	Native	-
6	*Ardeolagrayii*	Pond Heron	LC	Native	-
7	*Athene brama*	Spotted owlet	LC	Native	-
8	*Bubo bengalensis*	Indian eagle-owl	LC	Native	-
9	*Bubulcus ibis*	Cattle Egret	LC	Native	-
10	*Caprimulgus indicus*	Jungle Nightjar	LC	Native	-
11	*Centropus sinensis*	Greater coucal	LC	Native	-
12	*Cerylerudis*	Pied kingfisher	LC	Native	-
13	*Charadrius hiaticula*	Common ringed plover	LC	Native	-
14	*Chrysommasinense*	Yellow-Eyed Babbler	LC	Native	-
15	*Cinnyris asiaticus*	Purple sunbird	LC	Native	-
16	*Clamatorcoromandus*	Red-Winged	LC	Native	-
17	*Clamatorjacobinus*	Pied Cuckoo	LC	Native	-
18	*Columba elphinstonii*	Nilgiri Wood Pigeon	LC	Native	-
19	*Columba livia*	Blue rock pigeon	LC	Native	Sch - IV
20	*Copsychussaularis*	Magpie-robin	LC	Native	-
21	*Corvus splendens*	Hose crow	LC	Native	-
22	*Cuculuscanorus*	Common cuckoo	LC	Native	-
23	*Cuculusmicropterus*	Indian Cuckoo	LC	Native	-
24	*Dendrocittavagabunda*	rufous treepie	LC	Native	-
25	*Dicrurusmacrocercus*	Black drongo	LC	Native	-
26	*Duculaaenea*	Green Imperial Pigeon	NT	Native	-
27	*Egrettagarzetta*	Little Egret	LC	Native	-
28	*Eudynamysscolopaceus*	Koel	LC	Native	-
29	*Falco tinnunculus*	Common Kestral	LC	Native	-
30	*Francolinuspondicerianus*	Grey francolin	LC	Native	-
31	*Fulicaarta*	Common coot	LC	Native	-
32	*Gallicrex cinerea*	Watercock	LC	Native	-
33	*Glareolapratincola*	Collared Pratincole	LC	Native	-
34	*Haliasturindus*	Brahminy kite	LC	Native	-
35	*Leptocomazeylonica*	Sunbird	LC	Native	-
36	*Lonchura Malacca*	Black headed munia	LC	Native	-
37	*Lonchurapunctulata*	Scaly breasted munia	LC	Native	-

38	*Lonchura striata*	White rumped munia	LC	Native	-
39	*Megalaimahaemacephala*	Copper smith barbet	LC	Native	-
40	*Megalaimazeylanica*	Brown headed barbet	LC	Native	-
41	*Meropsorientalis*	Green bee eater	LC	Native	-
42	*Meropsphilippinus*	Blue-tailed bee-eater	LC	Native	-
43	*Microcarboniger*	Little Cormorant	NA	Native	-
44	*Milvus migrans*	Black kite	LC	Native	-
45	*Orthotomussutorius*	Common tailorbird	LC	Native	-
46	*Pavo cristatus*	Indian peafowl	LC	Native	Sch I (Part III)
47	*Phaethon lepturus*	White-Tailed Tropicbird	LC	Native	-
48	*Phalacrocorax carbo*	Great Cormorant	NA	Native	-
49	*Phalacrocorax fuscicollis*	Indian Cormorant	LC	Native	-
50	*Phalacrocorax niger*	Little cormorant	LC	Native	
51	*Podiceps nigricollis*	Eared grebe	LC	Native	
52	*Porphyriopoliocephalus*	Grey-Headed Swamphen	LC	Native	-
53	*Psittaculakrameri*	Rose ringed parakeet	LC	Native	-
54	*Rallinaeurizonoides*	Slaty-Legged Crake	NA	Native	-
55	*Sturniapagodarum*	Brahminy starling	LC	Native	-
56	*Tachybaptus ruficollis*	Dabchick	LC	Native	-
57	*Turdoidesaffinis*	Yellow-billed Babbler	LC	Native	
58	*Turnixtanki*	Yellow-Legged Buttonquail	LC	Native	-
59	*Vanellus indicus*	Red wattled lapwing	LC	Native	-

(Note: LC- Least Concern, NT- Near Threatened, EN- Endangered, NE-Not Evaluated, DD -Data Deficient, VU-Vulnerable, IUCN- International Union for Conservation of Nature, WPA-1972 (wildlife Protection Act - 1972).

3.10.4.2 Mammals

The presence of mammals in the project influence area are documented based on secondary information. List of Mammals recorded from the secondary Survey in the Study area and their Conservation Status is given in the

Table 3-22and Major fauna recorded from the secondary Survey in the Cauvery Wildlife Sanctuary is given in the **Table 3-23.**

Table 3-22List of Mammals recorded from the secondary Survey in the Study area and their Conservation Status

S. No	Species name	Family	Common name	IUCN Conservation Status	Schedule WPA1972

1	Canis aureus	Canidae	Naree	LC	-
2	*Felis chaus*	Felidae	Kaattupoonai	LC	-
3	*Funambulus pennanti*	Sciuridae	Anil	LC	-
4	*Bandicotabenghalensis*	Muridae	Varappu Eli	LC	-
5	*Cynopterus sphinx*	Pteropodidae	Nari mookuVavval	LC	-
6	*Macaca radiata*	Cercopithecidae	kurangu	LC	-
7	*Herpetesedwardsi*	Herpestidae	Keeri Pillai	LC	-

LC- Least Concern, NT- Near Threatened, EN- Endangered, NE-Not Evaluated, DD -Data Deficient, VU- Vulnerable, IUCN- International Union for Conservation of Nature. WPA-1972 (wildlife Protection Act - 1972).

Table 3-23 Major fauna recorded from the secondary Survey in the Cauvery Wildlife Sanctuary

S. No	Scientific name	Common name	Vernacular Name	IUCN Status	WPA 1972
1	*Panthera pardus fusca*	Indian leopard	Siruthai	VU	Sch I (Part I)
2	*Elephas maximus*	Asian elephant	Yaanai	EN	Sch I (Part I)
3	*Melursus ursinus*	Indian bear	Karadi	VU	Sch I (Part I)
4	*Bos gaurus*	Indian bison	KaatuErumai	VU	Sch I (Part I)
5	*Albino gaur*	White bison	-	VU	Sch I (Part I)
6	*Sus scrofa*	Wild boar	KaatuPandri	LC	Sch III
7	*Macaca silenus*	Lion-tailed macaque	SingavalKurangu	EN	Sch I (Part I)
8	*Semnopithecus johnii*	Nilgiri langur	Karunkurangu	VU	Sch I (Part I)
9	*Semnopithecus entellus*	Gray langurs	SaambalKurangu	VU	Sch I (Part I)
10	*Macaca radiata*	Bonnet macaque	Kurangu	VU	Sch I (Part I)
11	*Tetracerus quadricornis*	Four-horned antelope	Sarugu Maan	VU	Sch I (Part I)
12	*Cuon alpinus*	Dhole	Sennai	EN	Sch I (Part I)
13	*Mellivora capensis*	Honey badger	Ratel	LC	Sch I (Part I)
14	*Scandentia*	Tree Shrew	Mara Anil	EN	Sch I (Part I)
15	*Rusa unicolor*	Sambar	Saabal Maan	VU	Sch I (Part I)
16	*Chevrotains*	Mouse-deer	Sarugu Maan	VU	Sch I (Part I)
17	*Muntiacus muntjak*	Southern red muntjac	common muntjac	LC	Sch III
18	*Felis chaus*	Reed cat	Kaatu Poonai	LC	Sch II (Part I)
19	*Viverricula indica*	Small Indian civet	Punugu Poonai	LC	Sch II (Part I)
20	*Paradoxurus hermaphroditus*	Asian palm civet	Punugu Poonai	LC	Sch II (Part I)
21	*Ratufa macroura*	Grizzled giant squirrel	Kaatu Anil	NT	Sch I (Part I)

LC- Least Concern, NT- Near Threatened, EN- Endangered, NE-Not Evaluated, DD -Data Deficient, VU-Vulnerable, IUCN- International Union for Conservation of Nature. WPA-1972 (wildlife Protection Act - 1972).

3.10.4.3 Reptiles & Amphibians

Reptiles and amphibian species were prepared with secondary information sourced from publications. List of Reptiles & Amphibians recorded from the Primary Survey in the Study area and their Conservation Status is given in the **Table 3-24.**

Table 3-24 List ofReptiles & Amphibians recorded from the Primary Survey in the Study area and their Conservation Status

S. No	Scientific name	Common name	IUCN Status	WPA 1972
Reptiles				
1	*Hemidactylus sp.*	House lizard	LC	-
2	*Eutropismacularia*	Common skink	LC	-
3	*Ophisopsleschenault*	Snake-eyed lizard	LC	-
4	*Calotesversicolar*	Garden lizard	LC	-
5	*Naja naja*	Nalla Pambu	LC	Sch II (Part II)
6	*Ptyas mucosa*	SaaraiPambu	LC	-
Amphibians				
1	*Rana tigrina*	Common yellow frog	LC	-
2	*Rana hexadactyla*	Indian Green frog	LC	-
4	*Oziotelphusaravi*	Field Crab	LC	-
5	*Nerodiasipedon*	ThanniPambu	LC	

3.10.4.4 Butterfly Species

Butterflies can also serve as useful indicators of habitat biodiversity. They are responsible for a large part of the complex interconnections that characterize natural ecosystems. The butterfly communities that are present in forests help to maintain crucial ecological processes and preserve biodiversity as a whole. They participate in most of the ecological processes that sustain ecosystems. A total of 35 species belonging to five families of butterflies were recorded. List of Occurrence of butterfly species in buffer zone is given in the **Table 3-25.**

Table 3-25 List of Occurrence of butterfly species in buffer zone

S. No	Scientific Name	Family	Common Name
1	*Ariadne merione*	Nymphalidae	Common Caster
2	*Atrophaneuraaristolochiae*	Paplionidae	Common Rose
3	*Acraea terpsicore*	Nymphalidae	Tawny coster
4	*Anthenelycaenina*	Polyommatinae	Pointed Ciliate Blue
5	*Athymaperius*	Nymphalidae	Common Sergeant
6	*Belenoisaurota*	Pieridae	Pioneer
7	*Euremaandersonii*	Pieridae	One-spotgrass yellow
8	*Ceporanerissadapha*	Pieridae	Common gull
9	*Catopsiliapomona*	Pieridae	Common Emigrant
10	*Catopsiliapyranthe*	Pieridae	Mottled Emigrant
11	*Cupithapurreea*	Hesperiidae	Wax Dart
12	*Colotisetrida*	Pieridae	Small Orange Tip
13	*Curetis spp*	Curetinae	Indian Sunbeam
14	*Danaus chrysippus*	Nymphalidae	Plain Tiger
15	*Danaus genutia*	Nymphalidae	Striped Tiger
16	*Deudorixepijarbas*	Theclinae	Cornelian
17	*Euremahecabe*	Pieridae	Common Grass Yellow
18	*Graphiumteredon*	Papilionidae	Southern Bluebottle
19	*Graphiumdoson*	Papilionidae	Narrow-banded Bluebottle
20	*Hypolimnasbolina*	Nymphalidae	Great Egg Fly
21	*Hypolimnasmisippus*	Nymphalidae	Danaid Egg Fly
22	*Junoniaalmana*	Nymphalidae	Peacock Pansy
23	*Junoniahierta*	Nymphalidae	Yellow Pansy
24	*Junonialemonias*	Nymphalidae	Lemon Pansy
25	*Junoniaorithya*	Nymphalidae	Blue Pansy
26	*Leptosianina*	Pieridae	Psyche
27	*Mycalesisperseus*	Nymphalidae	Common Bush Brown
28	*Neptishylas*	Nymphalidae	Common Sailer
29	*Neptis nata hampsoni*	Nymphalidae	Sullied Sailer
30	*Phalantaphalantha*	Nymphalidae	Common Leopard
31	*Pachlioptaaristolochiae*	Papilionidae	Common Rose
32	*Pachlioptapandiyana*	Papilionidae	Malabar Rose

33	*Sarangesapurendra Moore*	Pyrginae	Spotted Small Flat
34	*Troidesminos*	Papilionidae	Southern Birdwing
35	*Ypthimaasterope*	Nymphalidae	Common Three-ring

Source:

- List of Birds: Ali, S. (2002). The Book of Indian Birds (13th Revised Edition). Oxford University Press, New Delhi, 326pp.
- List of Butterflies: Kehimkar I. The Book of Indian Butterflies. Bombay Natural History Society, 2008, 497.
- Evans WH. Identification of Indian butterflies. The Bombay Natural History Society, Bombay, 1927, 32.
- List of Mammals: Kamalakannan, M.& P.O.Nameer (2019). A checklist of mammals of Tamil Nadu, India. Journal of Threatened Taxa 11(8):13992–14009; https://doi.org/10.11609/jott.4705.11.8.13992–14009.
- List of Reptiles: Aengals, R., Sathish Kumar, V.M., Palot, M.J. & Ganesh, S.R. (2018). A Checklist of Reptiles of India. 35 pp. Version 3.0. Online publication is available at www.zsi.gov.in (Last update: May 2018).
- S. S. Mishra, Laishram Kosygin, P. T. Rajan and K. C. Gopi, Zoological Survey of India in Venkataraman, K., Chattopadhyay, A. and Subramanian, K.A. (editors). 2013. Endemic Animals of India (vertebrates): 1–235+26 Plates. (Published by the director, Zoological Survey of India, Kolkata).

3.10.4.5 Fish Diversity presence

The study area transverse agricultural land, open shrub land, rivers etc. that support the presence of fish diversity. Fish in the area and their presence were reported with the help of secondary sources and from the literature available. List of Occurrence of fish in buffer zone is given in the

Table 3-26.

Table 3-26 List of Occurrence of fish in buffer zone

S. No	Scientific name	Family	Common name	Occurrence	IUCN status
1	*Oreochromis niloticus*	Cichlidae	Jilappi	Native	LC
2	*Labeo boga*	Cyprinidae	Kendai	Native	LC
3	*Tamarixmacrochir*	Cichlidae	Greenhead tilapia	Native	LC
4	*Channa marulius*	Channidae	Giant snakehead	Native	LC
5	*Oreochromis mossambicus*	Cichlidae	Tilapia	Native	LC
6	*ChanosChanos*	Cichlidae	Madavai	Native	LC

7	*Cirrhinamrigala*	Cyprinidae	Kendai	Native	LC
8	*Catlacatla*	Cyprinidae	katla	Native	LC
9	*Labeo rohita*	Cyprinidae	Roghu	Native	LC
10	Hypselobarbusperiyarensis	Cyprinidae	Periyar Barb	Native	LC
11	Hypselobarbuspulchellus	Cyprinidae	Jerdon's carp	Endamic	CR
12	Karalla dussumieri	Leiognathidae	Vari Kare	Native	LC
13	Arius maculatus	Ariidae	keluthi	Native	LC
14	Barbodescarnaticus	Cyprinidae	Cauvery kendai	Native	LC
15	Chanda nama	Ambassidae	Kakkachee	Native	LC
16	Channa marulius	Channidae	Iru viral	native	LC
17	Channa striata	Channidae	Viral wrahl	Native	LC
18	Cirrhinuscirrhosus	Cyprinidae	Ven Kendai	Native	LC
19	Ctenopharyngodonidella	Xenocyprididae	Pullukendai	Native	LC

LC- Least Concern, NT- Near Threatened, EN- Endangered, NE-Not Evaluated, DD -Data Deficient, VU- Vulnerable, IUCN- International Union for Conservation of Nature. WPA-1972 (wildlife Protection Act - 1972).

Source:

- S. S. Mishra, Laishram Kosygin, P. T. Rajan and K. C. Gopi, Zoological Survey of India in Venkataraman, K., Chattopadhyay, A. and Subramanian, K.A. (editors). 2013. Endemic Animals of India(vertebrates): 1–235+26 Plates. (Published by the director, Zoological Survey of india, Kolkata)
- Talwar, P.K. and A.G. Jhingran 1991 Inland fishes of India and adjacent countries. vol 1. A.A. Balkema, Rotterdam. 541 p.

3.11 Socio Economic Profile

3.11.1 Demographic details

In 2011, Krishnagiri had population of 1,879,809 of which male and female were 960,232 and 919,577 respectively. In 2001 census, Krishnagiri had a population of 1,561,118 of which males were 803,077 and remaining 758,041 were females.

Source: ***https://www.census2011.co.in/census/district/25-krishanagiri.html***

3.11.2 Population Density

Out of the total Krishnagiri population for 2011 census, 22.79 percent lives in urban regions of district. In total 428,363 people lives in urban areas of which males are 217,788 and females are 210,575. Sex Ratio in urban region of Krishnagiri district is 967 as per 2011 census data.

Source: ***https://www.census2011.co.in/census/district/25-krishanagiri.html***

3.11.3 Sex Ratio

With regards to Sex Ratio in Krishnagiri, it stood at 958 per 1000 male compared to 2001 census figure of 944. The average national sex ratio in India is 940 as per latest reports of Census 2011 Directorate. In 2011 census, child sex ratio is 926 girls per 1000 boys compared to figure of 869 girls per 1000 boys of 2001 census data.

Source: ***https://www.census2011.co.in/census/district/25-krishanagiri.html***

3.11.4 Scheduled Castes and Scheduled Tribes

As per the Census India 2011, Krishnagiri Taluk has 141113 households, population of 597071 of which 300821 are males and 296250 are females. The population of children between age 0-6 is 67555 which is 11.31% of total population. Out of total population, 77.75% of population lives in Urban area and 22.25% lives in Rural area. There are 12.08% Scheduled Caste (SC) and 0.74% Scheduled Tribe (ST) of total population in Krishnagiri Taluk.

Source : ***https://www.censusindia2011.com/tamil-nadu/krishanagiri/krishanagiri-population.html***

3.11.5 Socio Economic Aspects

A socio-economic study was undertaken in assessing aspects which are dealing with social and cultural conditions, and economic status in the study area. The study provides information such as demographic structure, population dynamics, infrastructure resources, and the status of human health and economic attributes like employment, per-capita income, agriculture, trade, and industrial development in the study area. The study of these characteristics helps in identification, prediction and evaluation of impacts on socio-economic and parameters of human interest due to proposed project developments. Socio economic Indicators of Krishnagiri District is given in

Table 3-27**.**

Table 3-27Social Indicators of Krishnagiri District

S. No	Social Indicators	Krishnagiri District
1	Decadal variation %	20.7
2	Urban population %	22.8
3	Population density (Persons per square Km)	370
4	Scheduled caste population %	14.2
5	Scheduled tribe population %	1.2

6	Literacy rate %	72.41

Source :District_Report_Cards-2016-17-Vol-II.pdf

3.11.6 Education & Literacy

The literacy rate of the district according to the 2011 Census is 72.41. Among the blocks, 14 Hosur had the highest literacy rate (82.86) followed by Krishnagiri (77.73). In 2011, the lowest literacy rate was observed in Thally block (61.93).

Source : https://spc.tn.gov.in/Exe_Summary_DHDR/Krishanagiri.pdf

The educational infrastructure in the Krishnagiri district is given in **Table 3-28.**

Table 3-28 Education Infrastructures in theKrishnagiri District

Type of school	Total schools
Primary school	1281
Primary school with Upper Primary school	323
Primary school with Upper Primary school & Secondary and Higher Secondary school	81
Upper Primary school	4
Upper Primary school & Secondary and Higher Secondary school	108
Primary school with Upper Primary school & Secondary school	56
Upper Primary school & Secondary school	170

Source:District_Report_Cards-2016-17-Vol-II.pdf

3.11.7 Social Economic Profile of the study area

Table 3-29 provides the details on population profile within study area. **Table 3-30**show the socio-economic indicator within the study area.

Table 3-29Population profile within study area

Name	Household	Population	Male	Female	Children below 6	Scheduled Caste	Scheduled Tribe
0-5 km							
Hosapalli	627	2619	1355	1264	334	184	6
Pachapanatti	863	3895	1959	1936	446	380	231
Jakkeri	914	3957	1989	1968	383	844	127
Rathnagiri	505	2342	1221	1121	305	369	127
Kelamangalam (TP)	3098	13321	6684	6637	1542	1782	27
Kottapatti	831	3392	1733	1659	394	493	0
Doddagounipalli	202	940	484	456	172	102	240
Bithireddi	693	3076	1585	1491	327	419	96
Thavarakarai	541	2382	1247	1135	229	173	0
Kottur	637	2712	1415	1297	252	458	6
Total	**8911**	**38636**	**19672**	**18964**	**4384**	**5204**	**860**
5-10 km							
Puram	140	589	318	271	60	264	0
Alnatham	71	327	170	157	28	77	0
Karupalli	73	332	181	151	27	41	0
Thuppuganapalli	989	4281	2192	2089	501	1201	0
Mugalur	609	2593	1352	1241	273	1023	0
Uddanapalli	1091	4691	2387	2304	555	648	58
Singiripalli	112	558	299	259	51	38	0
Kurubarapalli	1171	5354	2760	2594	742	502	0
Agaram	1452	5697	2856	2841	642	624	20
Balekuli	1772	7025	3623	3402	693	194	0
Bairamangalam	1207	4932	2569	2363	520	1213	11
Nagamangalam	1115	4948	2502	2446	577	650	57
Hanumanthapuram	1125	5241	2712	2529	705	652	739
Total	**10927**	**85204**	**43593**	**41611**	**9758**	**12331**	**1745**
Grand Total	**19838**	**123840**	**63265**	**60575**	**14142**	**17535**	**2605**

(***Source:*** *Census 2011*)

Table 3-30 Summary of Socioeconomic indicators within the study area

S. No	Particulars	Study Area	Unit
1	Number of villages in the Study Area	22	Nos.
2	Number of Towns/Municipality in study area	1	Nos.
3	Total Households	19838	Nos.
4	Total Population	123840	Nos.
5	Children Population (<6 Years Old)	14142	Nos.
6	SC Population	17535	Nos.
7	ST Population	2605	Nos.
8	Total Working Population	59388	Nos.
9	Main Workers	49677	Nos.
10	Marginal Workers	9711	Nos.
11	Literates	72514	Nos.

*(**Source:** Census 2011)*

3.11.8 Employment and livelihood

Table 3-31 shows the classification of workers within the study area. Details of Literacy population in the study area is given in **Table 3-32.**

Table 3-31Classification of workers within study area

Name	Total Workers	Main Workers	Marginal Workers	Agriculture Workers				Main		Marginal	
				Main		Marginal					
				Cultivators	Agri.	Cultivators	Agri.	Household	Others	Household	Others
0-5 km											
Hosapalli	1341	667	674	137	375	157	188	4	151	8	321
Pachapanatti	1772	935	837	470	277	183	588	16	172	6	60
Jakkeri	2088	1735	353	467	814	7	284	28	426	5	57
Rathnagiri	1321	840	481	584	232	183	262	3	21	7	29
Kelamangalam (TP)	5522	5242	280	393	854	35	34	357	3638	22	189
Kottapatti	1511	1260	251	191	685	4	136	10	374	5	106
Doddagounipalli	532	527	5	183	295	0	4	12	37	0	1
Bithireddi	1655	1586	69	822	627	2	26	55	82	40	1
Thavarakarai	1309	1293	16	796	328	1	13	6	163	0	2
Kottur	1194	862	332	593	122	39	233	0	147	3	57
Total	**18245**	**14947**	**3298**	**4636**	**4609**	**611**	**1768**	**491**	**5211**	**96**	**823**
5-10 km											
Puram	213	118	95	16	24	11	65	23	55	8	11
Alnatham	91	69	22	62	0	0	15	0	7	0	7
Karupalli	135	132	3	98	15	1	0	3	16	1	1
Thuppuganapalli	2395	2322	73	445	1563	17	23	24	290	3	30
Mugalur	1072	1039	33	530	361	2	18	1	147	2	11
Uddanapalli	2306	1820	486	1049	81	51	198	71	619	50	187
Singiripalli	341	332	9	235	68	2	6	0	29	0	1
Kurubarapalli	2235	1524	711	253	236	64	55	27	1008	113	479
Agaram	2556	2421	135	515	1203	12	74	34	669	4	45
Balekuli	3624	3263	361	2368	513	134	181	1	381	4	42
Bairamangalam	2330	1723	607	725	282	98	406	26	690	2	101
Nagamangalam	2617	2326	291	1151	734	73	97	53	388	45	76

Hanumanthapuram	2983	2694	289	1011	1367	217	65	17	299	1	6
Total	**41143**	**34730**	**6413**	**13094**	**11056**	**1293**	**2971**	**771**	**9809**	**329**	**1820**
Grand Total	**59388**	**49677**	**9711**	**17730**	**15665**	**1904**	**4739**	**1262**	**15020**	**425**	**2643**

*(**Source:** Census 2011)*

Table 3-32 Details of Literacy population in the study area

Name	Literates Population	Male Literates	Female Literates	Literates %
0-5 km				
Hosapalli	1406	831	575	1.94
Pachapanatti	2098	1183	915	2.89
Jakkeri	2347	1337	1010	3.24
Rathnagiri	1316	766	550	1.81
Kelamangalam (TP)	8861	4822	4039	12.22
Kottapatti	2109	1197	912	2.91
Doddagounipalli	347	206	141	0.48
Bithireddi	1574	914	660	2.17
Thavarakarai	1309	779	530	1.81
Kottur	1534	904	630	2.12
Total	**22901**	**12939**	**9962**	**31.58**
5-10 km				
Puram	399	245	154	0.55
Alnatham	176	118	58	0.24
Karupalli	181	113	68	0.25
Thuppuganapalli	2328	1340	988	3.21
Mugalur	1471	862	609	2.03
Uddanapalli	2779	1563	1216	3.83
Singiripalli	347	216	131	0.48
Kurubarapalli	3100	1766	1334	4.28
Agaram	3297	1903	1394	4.55
Balekuli	3916	2311	1605	5.40
Bairamangalam	3376	1940	1436	4.66
Nagamangalam	2675	1559	1116	3.69

Hanumanthapuram	2667	1578	1089	3.68
Total	**49613**	**28453**	**21160**	**68.42**
Grand Total	**72514**	**41392**	**31122**	**100.00**

*(**Source:** Census 2011)*

Interpretation of Results:

59.3% of Literacy and 52.8% of Non-Workers in 0-5km zone and 58.2% of Literacy and 51.7% of Non-Workers in 5-10km zone. The literacy rate of the study region is 58.6%. The study area has more than 50% non-workers. There is a need to establish more industries so that the maximum number of employments can be generated.

S. No	Impact Zone	Number of villages	Total Population	Male %	Female %	SC population%	ST population%	Total Workers%	Main Workers %	Marginal Workers%	Literacy%	Non-Workers%
1	0-5km	10	38636	50.9	49.1	13.5	2.2	47.2	38.7	8.5	59.3	52.8
2	5-10km	13	85204	51.2	48.8	14.5	2.0	48.3	40.8	7.5	58.2	51.7
Total		**23**	**123840**	**51.1**	**48.9**	**14.2**	**2.1**	**48.0**	**40.1**	**7.8**	**58.6**	**52.0**

3.12 Summary:

Ambient Air Quality Monitoring						
S. No	**Criteria Pollutants**	**Unit**	**Maximum value**	**Minimum Value**	**98th Percentile Value**	**Prescribed Standard**
1	PM_{10}	µg/m³	67.6	37.2	66.0	100
2	$PM_{2.5}$	µg/m³	37.2	20.5	36.3	60
3	SO_2	µg/m³	12.6	5.1	12.3	80
4	NO_x	µg/m³	30.9	14.6	30.2	80
All the results of ambient air quality parameters have been found within the limit as per NAAQS. Based on comparison study of results for tested parameters with NAAQS, it is interpreted that ambient air quality of studied locations is good. This interpretation relates to the results found for corresponding locations and study period.						
Noise Monitoring						
S. No	**Parameters**	**Unit**	**Maximum Value**	**Minimum value**	**Prescribed standard (residential areas)**	
1	Leq (day)-residential areas)	dB(a)	54	48.5	55	
2	Leq(Night)residential areas)	dB(a)	44.2	36.9	45	
In Industrial areas daytime noise levels were about 51.5 dB(A) and 42.8 dB(A) during nighttime, which is within prescribed limit by CPCB (75 dB(A) Day time & 70 dB(A) Nighttime). The field observations during the study period indicate that the ambient noise levels are well within the prescribed limit by CPCB (55 dB(A) Day time & 45 dB(A) Nighttime).						
Surface Water						
S. No	**Parameters**	**Unit**	**Maximum Value**	**Minimum Value**	**IS 2296 Class A**	
1	pH	-	7.85	7.12	6.5-8.5	
2	TDS	mg/l	710	403	500	
3	DO	mg/l	6.2	5.5	6	
4	COD	mg/l	40.5	24.6	-	
5	BOD	mg/l	4.5	1.1	2	
The surface water results were compared with IS 2296:1192 standard and in respect of CPCB water Quality Criteria for designated best use. Based on comparison study of test results with Surface water Quantity Standards (Is 2296 Class A), it is interpreted that water qualities of studied locations are classified under Class E, which can be used for irrigation industrial cooling, and controlled waste disposal.						
Ground Water						
S. No	**Parameters**	**Unit**	**Maximum Value**	**Minimum Value**	**Acceptable Limit**	**Permissible Limit**
1	pH	-	7.68	7.18	6.5-8.5	-
2	Total Hardness	mg/l	277	201	200	600
3	Chloride	mg/l	208	123	250	1000
4	Fluoride	mg/l	0.48	0.21	1.0	1.5
5	Sulphate	mg/l	52.1	30.7	400	200

Based on comparison study of test results with drinking water standard, it is interpreted that water qualities of studied locations meet with the drinking water standards as per IS 10500: 2012 Permissible Limit. These interpretations relate to the sample tested for location only. To prevent ground water contamination and improving the quality and Quantity, rainwater harvesting, and groundwater recharging may be helpful.

Soil Quality

S. No	Parameters	Unit	Maximum Value	Minimum Value
1	pH	-	7.77	6.99
2	EC	µmhos/cm	385	138
3	Nitrogen	kg/ha	141	71
4	Phosphorus	kg/ha	25	15
5	Potassium	kg/ha	91	58

As per the Indian Council of Agricultural research characterization all locations soils are having PH, Neutral to Slightly Alkaline range, Electrical conductivity is Average, potassium rage is very less,Nitrogen as N is Less to good range and Phosphorus range from very less to less range.

Ecology and Biodiversity

This area hosts common animals. Indian Dogs, Jungle and Domestic cat, Rhesus macaque, Domestic Cows, Buffaloes, Bullocks, and Goat etc. are found amongst mammals. There are some Schedule species like *Columba livia* (Blue rock pigeon) – Sch – IV, *Pavo cristatus* (Indian peafowl) - Sch I (Part III), *Sus scrofa (*Wild boar*)*- Sch III, *Mellivora capensis (*Honey badger*)*- Sch I (Part I), *Muntiacus muntjak (*Southern red muntjac*)*- Sch III, *Felis chaus (*Reed cat*)* - Sch II (Part I), *Viverricula indica* (Small Indian civet) - Sch II (Part I), *Paradoxurus hermaphroditus* (Asian palm civet) - Sch II (Part I), *Ratufa macroura* (Grizzled giant squirrel) - Sch I (Part I) &*Naja naja* (Nalla Pambu) - Sch II (Part II) and some vulnerable species like *Panthera pardus fusca* (Indian leopard)- Sch I (Part I), *Melursus ursinus* (Indian bear) - Sch I (Part I), *Bos gaurus* (Indian bison) - Sch I (Part I), *Albino gaur* (White bison)- Sch I (Part I), *Semnopithecus johnii (*Nilgiri langur*)* - Sch I (Part I), *Semnopithecus entellus* (Gray langurs) - Sch I (Part I), *Macaca radiata* (Bonnet macaque) - Sch I (Part I), *Tetracerus quadricornis* (Four-horned antelope) - Sch I (Part I), *Rusa unicolor* (Sambar) - Sch I (Part I) and *Chevrotains* (Mouse-deer) - Sch I (Part I). There are few endangered species like *Elephas maximus* (Asian elephant) - Sch I (Part I), *Macaca Silenus (*Lion-tailed macaque*)* - Sch I (Part I), *Cuon alpinus* (Dhole) - Sch I (Part I), *Scandentia*(Tree Shrew) - Sch I (Part I) identified in the buffer zone of the study area. There are no rare species identified in the study area.

Socio-Economic

The literacy rate of the study region is 58.6%. The study area has more than 50% non-workers. There is a need to establish more industries so that the maximum number of employments can be generated.

4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The impacts due to mining operation and its mitigation measures adopted are detailed in this chapter. In general, the opencast mining operations cause environmental problems such as degradation of land, deteriorating air, water, and soil quality, affecting the biological and socio-economic environment of the area, if adequate control measures are not taken to prevent/mitigate the adverse environmental impacts, these operations may cause irreversible damage to the eco-system.

The opencast mining operations involve development of benches, approach roads, haul roads, Drilling, excavation, and handling & transportation of materials. If adequate control measures are not taken to prevent/mitigate the adverse environmental impacts, these operations may cause environmental degradation and lead to irreversible damage to the ecosystem. Various environmental impacts, which have been identified due to the mining operations proposed project, are discussed in the following sections. The environmental parameters most affected by mining activities are:

- Air quality including Climate.
- Noise levels and ground vibrations
- Water resources and quality
- Land use Pattern.
- Soil quality
- Flora and Fauna
- Socio-Economic conditions
- Occupational Health

Objective of this chapter is to:

- Identify project activities that could beneficially or adversely impact the environment.
- Predict and assess the environmental aspects and impacts of such activities.
- Examine each environmental aspect-impact relationship in detail and identify its degree of significance.
- Identify possible mitigation measures for these project activities and select the most appropriate mitigation measure, based on the reduction in significance achieved and practicality in implementation.

This methodology is used in this chapter for preparing impacts and their listing evaluation. Mitigation measures are formulated based on the significance of the impact as discussed in Methodology; environmental impacts have been identified based on an assessment of environmental aspects associated with the project. The symbol 'a-Ve' indicates an adverse (negative) impact, and 'b+Ve' indicates a beneficial (positive) impact. Identified environmental impacts have been listed in **Table 4-1.**

Table 4-1Impact Identification from proposed project

S. No	Project activities/Aspects	Potential Environmental attributes									Summary of Indication
		Land use/ Landcover (LU/LC)	Air Quality (AQ)	Noise and Vibration (NV)	Surface Water (SW)	Ground Water (GW)	Soil (S)	Ecology & Biodiversity (EB)	Socio-Economic (SE)	Occupational Health, Community Health & Safety (OH / CH&S)	
1	Site selection-Land Acquisition	*a-Ve*	-	-	-	-	-	-	*b +Ve*	-	LU/LC (-): Potential change in land cover SE (+): Economic development and Employment to local
2	Preparation of site-Clearance of vegetation at site	*a-Ve*	-	-	-	-	*a-Ve*	*a-Ve*	-	-	LC (-): Change in land cover from vegetation cover to barren (since land use change will be long term /permanent being development operations) EB (-): Possible loss of vegetation cover SE (+): short time employment
3	Excavation	*a-Ve*	*a-Ve*	*a-Ve*	*a-Ve*	*a-Ve*	*a-Ve*	*a-Ve*	*b +Ve*		LU (-) Creation of pit and some area will be converted to the reservoir. AQ (-) Dust emission due to mining activities, use of rock breaker, vehicular movement, and use of dewatering pump NV (-) Due to mining activities, use of compressor and use of machineries for mining

											SW, GW (-) use of water for dust suppression, domestic purpose and Greenbelt development EB (-) dust emission, Removal of vegetation and generation of noise SE (+) generation of employment
4	Stacking of Mineral Reject and Handling	-	*a-Ve*	*a-Ve*	-	-	-	*a-Ve*	-	-	AQ (-) generation of dust NV (-) generation of noise EB (-) generation of noise and dust emission
5	Transportation of mining material	-	*a-Ve*	*a-Ve*	-	-	-	*a-Ve*	*b +Ve*	-	AQ (-) generation of dust NV (-) generation of noise EB (-) generation of noise SE (+) Employment Generation
6	Land Reclamation	*a-Ve*	*a-Ve*	-	-	*a-Ve*	*a-Ve*	*b +Ve*	*b +Ve*	-	LU (-) some areas will be converted to water reservoir. AQ (-): Dust emission due to leveling. EB (+): Some areas will be converted to water reservoirs. SE (+): generation of water reservoir

4.1 Land Environment

The proposed site is located at S.F.No.486 (Part) & 736/4, Jakkery Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu State. The lease area for mining of color granite is 27.04.5 Ha. The quarry land is classified as Government Poramboke land. The quarry lease was applied, quarry lease vide G.O.Ms. No. 238, Industries (MME-1) dept dated 17.03.1999 for 20 years. The land use pattern is given in **Table 2-15.**

4.1.1 Anticipated Impact

The impact on land pattern in the area has been and will be due to the following:

- Landdegradationisduetodisposaloflargevolumesofwastematerials.
- Creation of infrastructural facilities like office, rest shelter, first-aid Centre, and other service facilities.
- Exposure of topsoil to wind and water erosion.

Table 4-2 Land Use Pattern of the lease area

S. No	Description	Present Area (Ha)	Area to be Required Mining Plan Period (Ha)
1	Mining	2.77.0	0.80.0
2	Approach Road	0.40.0	-
3	Waste Dump	1.99.0	2.36.0
4	Office Infrastructure	0.01.5	-
5	Afforestation	0.12.0	0.06.5
6	Unutilized Area	21.75.0	18.52.5
Total		**27.04.5**	**21.75.0**

Table 4-3 Land Use Impact and Indications

S. No	Project Activities. Aspects	Potential Environmental Impact on LU/LC	Summary of Indication
1	Land acquisition	-ve	LU/LC (-): Potential change in land cover
2	Clearance of vegetation at site	-ve	LC (-): Change in land cover from vegetation cover to barren (Since land use change will be a long term/permanent being development operations)
3	Excavation	-ve	LU (-) creation of pit and some area will be coverted to the reservoir / open pit
4	Land Reclamation	-ve	LU (-) some area will be converted to water reserviror / open pit

Based on this above identification of impacts, environmental indices that are likely to beimpacted due to the project are:

- Removal of site vegetation will change Land cover.
- Generation of Debris and generation of pit leading to change in topography due to
- Generation of Debris and generation of pit leading to change in topography other machinery, workers / labours etc.

4.1.2 Mitigation Measures

- Dust suppression on exposed are as using watertankers.
- Contour over burden dump to minimize erosion.
- Plantation around service building, along road, in and around safety zone using native plant sapling.
- Compliance with mine decommissioning plan.
- Drainage control structures like garland drain to be made around quarry to avoid water flow during monsoon.
- Levelling, grading, and drainage arrangement for stock dumps

The following precautions will be taken to reduce the risk of dump failure:

- OB benches will be made of <10 m height in each tier. Angle of repose of OB dump to be around 26^0.Construction of toe wall around the OB dump.
- Drainage control structures like garland drain to be made around OB dump area to avoid water flow during monsoon below the OB dump.
- Leveling, grading and drainage arrangement for OB dumps.
- The deeper working pits, after completion of mining /quarrying left as it is which would serve as water ponds/water reservoirs.
- The quarried pits after the end of the life of lease will be fenced to prevent inherententry of public and cattle.
- Management plan for topsoil utilization and conservation.
- Progressive year-wise green belt development ainside.

4.2 Air Environment

Base line data reveals that ambient air quality in the study area for the Parameters PM_{10}, $PM_{2.5}$ & NO_2, are well within the permissible Limits as prescribed by the National Ambient Air Quality Standards (NAAQS) for Industrial Area, Residential, Rural & Other areas.

The major air pollution sources from the mining operations are mining activities such as blasting, drilling, loading & unloading, Excavating and transportation etc. The particulate emissions & gaseous emissions mainly generated from the mining activities are Blasting, Drilling, Excavation, Loading, Unloading, and transportation etc. Machinery like compressors

and jack hammers are used for Drilling. The sources of air emission are detailed below in**Table 4-4.**

Table 4-4 Sources of air pollution at quarry

S. No	Source of emission	Pollutant
1.	Excavation / Mining activity	PM
2.	Operation of diesel driven equipment	Gaseous emission/Fugitive emissions
3.	Transportation	PM

4.2.1 Anticipated Impacts

The emissions mainly generated from the mining activities are Blasting, Drilling, Excavation, Loading, Unloading, and transportation etc. Machinery like compressors and jack hammers are used for Drilling.

4.2.2 Mitigation measures

- Use of dust aprons on drilling equipment and adopting wet drilling methods.
- Delay blasting under unfavorable wind and atmospheric conditions.

The production of blast fumes containing noxious gases will be reduced by the following methods:

- Use of adequate booster/primer.
- Proper stemming of the blast hole.
- Development of greenbelt.

4.2.2.1 During Mining

- Bore hole Drills of 32mm diameter will be used. Wet drilling is proposed.
- Personal protection equipment will be issued to drillers.
- The road in lease will be macadamized.
- Tipper trucks will be covered.

4.2.2.2 Green Belt

- There are no major trees existing within the lease area, except some bushes and thorny plants.
- The plantation will be developed inside the mining lease about 0.80.00 Ha, out of 27.04.5 Ha. The safety distance along the eastern side of the lease area has been identified to be utilized for afforestation. Native species will be planted.
- There is some topsoil, scattered at places, within the lease area and will be utilized for plantation purposes, on both sides of the approach road, to support trees.

Table 4-5 Fugitive dust & Particulate matter control in quarry

S. No	Activities	Fugitive Dust control Mitigation measure	Dust control Mitigation measure/Control options
1	Drilling	• Drills should be provided with dust extractors (wet system)	• Liquid injection (water or water plus a wetting agent) • Capturing and venting emissions to a control device.
2	Blasting	• Water sprinkling before blasting. • Water sprinkling on blasted material prior to transportation. • Use of control blasting technique.	
3	Excavation of site, Movement of JCBs, other machinery, workers / labors etc.	• Water sprinkling will be carried out as and when required.	
4	Transportation of mined material	• Covering of the trucks/dumpers to avoid spillage. • Compacted haul road Speed control on vehicles • Development of a green belt of suitable width on both sides of road, which acts as wind break and traps fugitive dust	
5	Loading	• Water sprinkling	
6	Hauling (emissions from roads)	• Water spray, treatment with surface agents, soil stabilization, paving, traffic control.	

4.2.3 Meteorological Data

The site-specific meteorological data for three months from **March 2024 – May 2024**was obtained and wind rose was plotted and shown in **Figure 4-1**. The meteorological data of three months was considered for the study. Data included for AERMET were daily wind speed, wind direction, temperature, relative humidity, air pressure, precipitation and solar radiation recorded during the period. AERMET reformats meteorological data so that it can be used as input for AERMOD model.

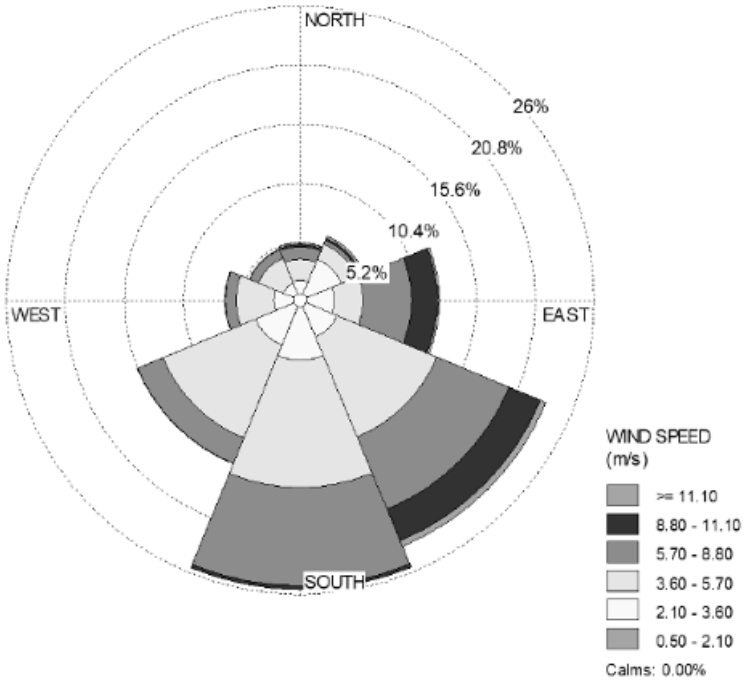


Figure 4-1 Wind rose of meteorology considered for modelling March 2024 – May 2024

4.2.4 AERMET Process

For the 3 phase AERMET processing of the meteorological data, specifications of the land use in the area are required to determine the terrain roughness for modelling. The land use was characterized in and around the site. The surface characteristics for the site and surroundings were selected and used to calculate the Albedo, Bowen ratio and surface roughness parameter.

The meteorological data were processed in the AERMET software to generate wind flow pattern & to generate surface meteorological data and profile meteorological data in a prescribed format that can be fed to AERMOD for modelling.

4.2.5 AERMOD Process

AERMOD Software Version 22112 (11.0.1) was used for air dispersion modelling. AERMOD MPI is Lakes Environmental parallel version of the AERMOD model. AERMOD MPI Version 22112 is the parallel version for the US EPA AERMOD model dated 22112 released by the US EPA on June 27, 2022, and is applicable to a wide range of buoyant or neutrally buoyant emissions up to a range of 50 km. In addition to more straightforward cases, AERMOD is also suitable for complex terrain and urban dispersion scenarios.

AERMOD is a steady-state plume model. In the stable boundary layer (SBL), it assumes the concentration distribution to be Gaussian in both the vertical and horizontal. In the convective

boundary layer (CBL), the horizontal distribution is also assumed to be Gaussian, but the vertical distribution is described with a bi-Gaussian probability density function (pdf). This behaviour of the concentration distributions in the CBL was demonstrated by Willis and Deardorff (1981) and Briggs (1993). Additionally, in the CBL, AERMOD treats "plume lofting," whereby a portion of plume mass, released from a buoyant source, rises to, and remains near the top of the boundary layer before becoming mixed into the CBL. AERMOD also tracks any plume mass that penetrates the elevated stable layer, and then allows it to re-enter the boundary layer when and if appropriate. For sources in both the CBL and the SBL AERMOD treats the enhancement of lateral dispersion resulting from plume meander. The emissions from proposed stacks are estimated and these stack emissions are used for the air dispersion modeling as shown in **Table 4-6.**

Maximum concentration value for PM10, PM2.5, & NOx obtained through modelling is shown in **Figure 4-2**, and **Figure 4-4** respectively and the first ten highest values of Ground Level Concentration (GLC) for proposed stacks is given in **Table 4-11**,

Table 4-12 and

Table 4-13 respectively.

4.2.6 Emission Calculations

Each mining activity is a source of emission, and the estimation of emissions depends on parameters such as meteorological, topographic conditions and material characteristics. It is necessary to calculate the number of emissions for work or a source on site to the atmosphere. The following emission formulas are used to calculate the emission rate for the different emission source.

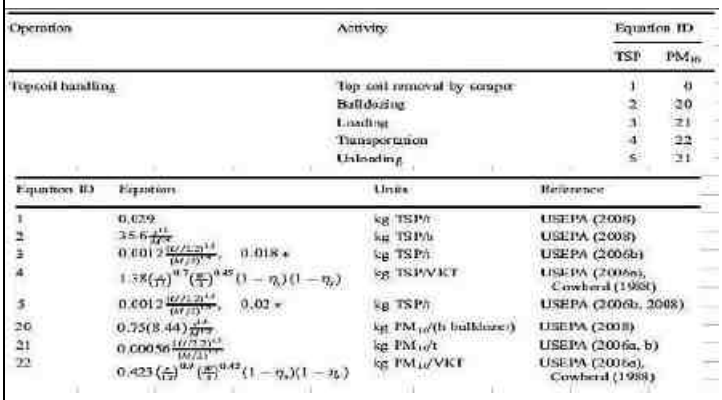
4.2.7 Mining Operational data

Table 4-6Overview of the Source Parameters

S. No	Description	Symbol	Quantity
1.	Moisture Content (%)	M	0.45
2.	Silt Content (%)	s	3
3.	Production / Day (m^3)		14.5
4.	Production / Day (Ton)		39.0
5.	No. of vehicles with categorization		1 no. HW 2 no. 4W
6.	Working Hours per day (hrs)		8
7.	**Control Efficiency Loading/Unloading, Excavation Operations (%)**	ŋ	97%

4.2.8 Emission Factors

Table 4-7 Emission Factor

Activity	Uncontrolled Emissions Factor	Reference
Topsoil excavation	Activities: 1. Bulldozing 2. Loading 3. Unloading 4. Transportation	***Jose I. Huertas & Dumar A. Camacho & Maria E. Huertas, Standardized emissions inventory methodology for open-pit mining areas, Environ Sci Pollut Res,2012.*** 
Wet Drilling for rough stone, Gravel	8.00E-05 lbs PM10 /ton	*EPA. August 2004. Section 11.19.2, Crushed Stone Processing and Pulverized Mineral Processing. In: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition, AP-42. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards. Research Triangle Park, North Carolina.*
Loading	1.00E-04 lbs PM10 /ton	
Unloading	1.60E-05 lbs PM10 /ton	
Haulage	6.2 lbs PM10 / Mile Tipper	

4.2.9 Emission Dispersion Models

Each mining activity is a source of emission, and the estimation of emissions depends on parameters such as meteorological, topographic conditions and material characteristics. The emission factors for PM2.5, which is particulate matter of 2.5µm or less in diameter, were not available in literature. Thus, PM2.5 emissions have been calculated considering an assumption that 60% of PM10 emissions contribute to PM2.5.

4.2.10 Mining Activities Emissions considered for mining

Table 4-8 Mining Activities Emissions considered for mining

S. No	Activities	Emission rate (g/s)			
		PM10	PM2.5	SO2	NOx
1	Topsoil excavation	0.0502	0.0251	-	-
2	Wet drilling	0.0017	0.00085	-	-
3	Hauling	0.983	0.4915	-	-
4	Conveyor loading	0.00215	0.001075	-	-
5	Unloading	0.001324	0.000662	-	-
	Total (g/s)	**1.038374**	**0.519187**	-	-

Table 4-9 Vehicular Emissions

S.No	Activities	PM10 Emission rate (g/s)	PM2.5 Emission rate (g/s)	NOX Emission rate (g/s)
1	4Wheels (Tippers & tankers)-1 Nos	0.000174	0.000104	0.00174
2	HW (Excavator)-2Nos	0.000833	0.000500	0.09720

Table 4-10 Emission considered for GLC

S. No	Activities	PM_{10} Emission rate (g/s)	$PM_{2.5}$ Emission rate (g/s)	NO_X Emission rate (g/s)
1	**Area Source**			
	Topsoil excavation	0.0502	0.0251	-
	Wet drilling	0.0017	0.00085	-
	Conveyor loading	0.00215	0.001075	-
	Unloading	0.001324	0.000662	-
	Sub Total (g/s)	**0.055374**	**0.027687**	-
2	**Line Source**			
	Haulage	0.983000	0.590000	-
	4Wheels (Tippers & tankers)-1Nos	0.000174	0.000104	0.00174
	HW (Excavator)-2Nos	0.000833	0.00050	0.09720
	DG -125KVA	0.001527	0.000763	0.02175
	Sub Total (g/s)	**0.985534**	**0.591367**	**0.12069**

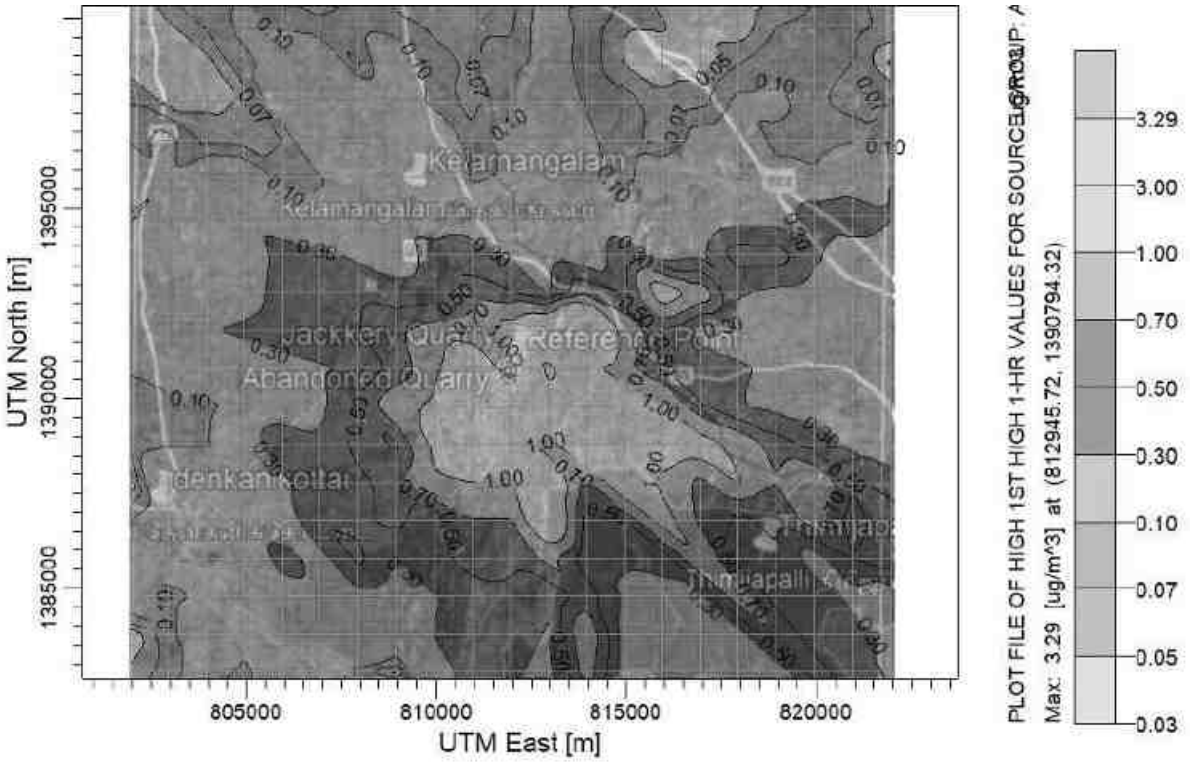


Figure 4-2 Predicted 24-Hrs GLC of PM_{10} within 10 km Radius of the Study Area

Table 4-11 Predicted Highest and Habitation receptors Concentrations PM_{10}

S. No	UTM Coordinates		Conc. (µg/m³)	Name of the habitation	Distance (km)	Direction
	E	N				
1	812945.7	1390794	3.28665	Project Site	-	-
2	813945.7	1391794	2.45393	No habitation	1.95	NE
3	812945.7	1389794	2.45024	No habitation	1.50	SE
4	810945.7	1389794	2.13669	No habitation	1.60	SW
5	811945.7	1389794	2.10985	No habitation	1.36	S
6	813945.7	1389794	1.74779	No habitation	2.20	SE
7	813945.7	1388794	1.65057	No habitation	2.80	SE
8	812945.7	1386794	1.53781	No habitation	4.20	SE
9	810945.7	1390794	1.50191	No habitation	1.24	E
10	814945.7	1389794	1.47544	No habitation	1.25	S

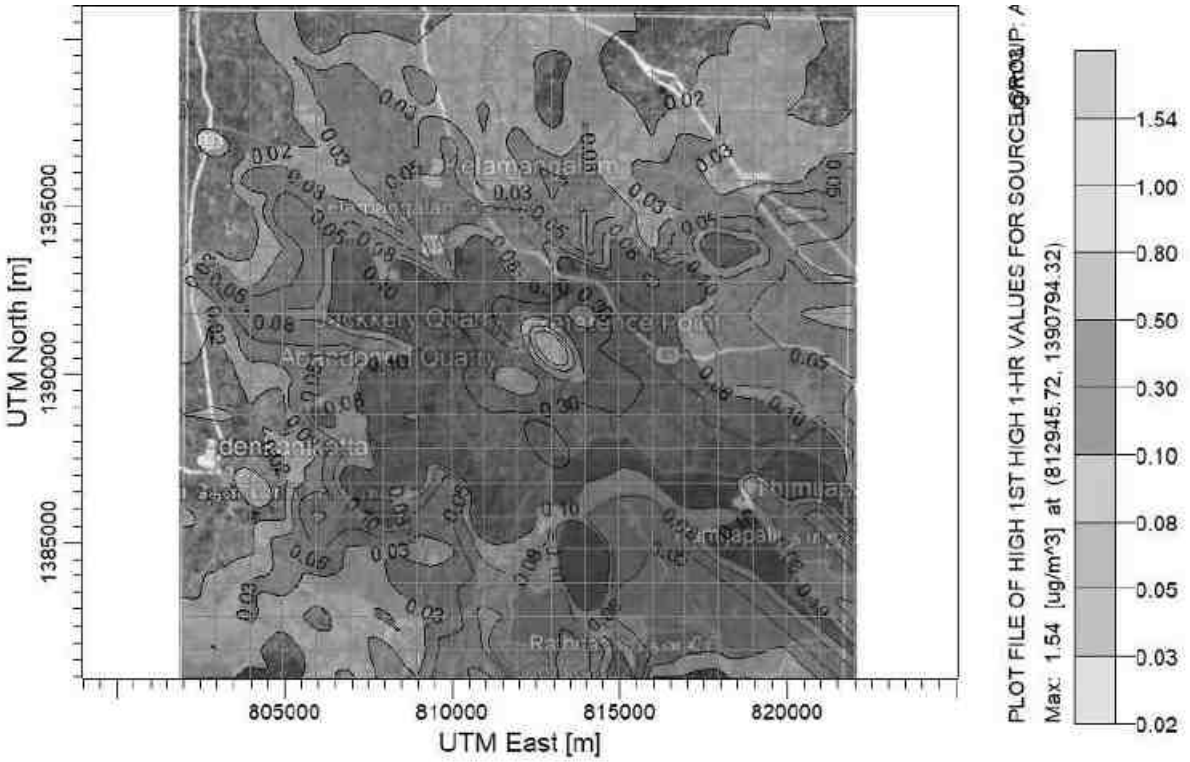


Figure 4-3 Predicted 24-Hrs GLC of $PM_{2.5}$ within 10 km Radius of the Study Area

Table 4-12 Predicted Highest and Habitation receptors Concentrations $PM_{2.5}$

S. No	UTM Coordinates		Conc. (µg/m³)	Name of the habitation	Distance (km)	Direction
	E	N				
1	812945.7	1390794	1.54388	Project Site	-	-
2	811945.7	1389794	0.67664	No habitation	1.95	NE
3	813945.7	1391794	0.647	No habitation	1.50	SE
4	812945.7	1387794	0.51179	No habitation	1.60	SW
5	813945.7	1389794	0.50653	No habitation	1.36	S
6	810945.7	1389794	0.47531	No habitation	2.20	SE
7	812945.7	1389794	0.44448	No habitation	2.80	SE
8	811945.7	1391794	0.43884	No habitation	4.20	SE
9	814945.7	1389794	0.41897	No habitation	1.24	E
10	812945.7	1391794	0.41159	No habitation	1.25	S

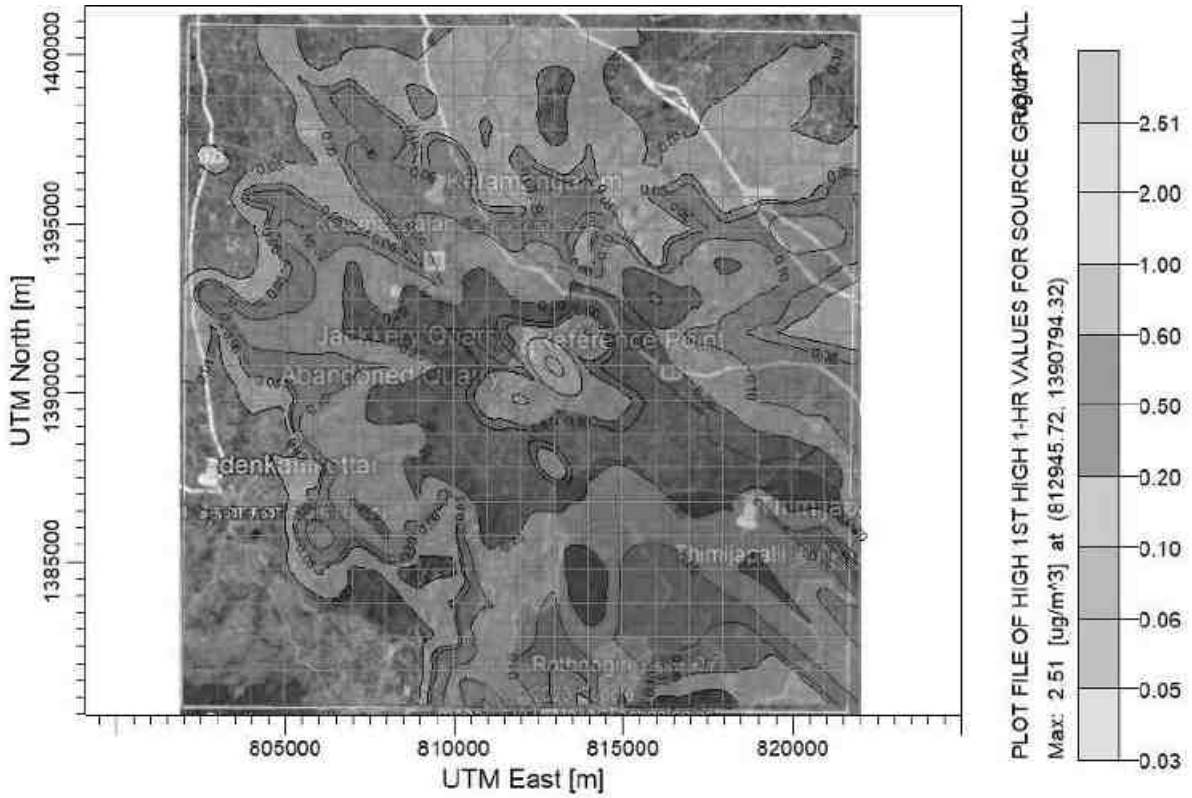


Figure 4-4 Predicted 24-Hrs GLC of NO_X within 10 km Radius of the Study Area

Table 4-13 Predicted Highest and Habitation receptors Concentrations NO_X

S. No	UTM Coordinates		Conc. (µg/m³)	Name of the habitation	Distance (km)	Direction
	E	N				
1	812945.7	1390794	2.50579	Project Site	-	-
2	811945.7	1389794	1.09822	No habitation	1.95	NE
3	813945.7	1391794	1.05011	No habitation	1.50	SE
4	812945.7	1387794	0.83066	No habitation	1.60	SW
5	813945.7	1389794	0.82213	No habitation	1.36	S
6	810945.7	1389794	0.77145	No habitation	2.20	SE
7	812945.7	1389794	0.72141	No habitation	2.80	SE
8	811945.7	1391794	0.71226	No habitation	4.20	SE
9	814945.7	1389794	0.68001	No habitation	1.24	E
10	812945.7	1391794	0.66802	No habitation	1.25	S

4.2.11 Conclusion

It was observed that the maximum ground level concentration observed due to mining activities and traffic movement without control measures for PM10, PM2.5 and NOx are 3.29 µg/m^3, 1.54 µg/m^3 and 2.51 µg/m^3 respectively. The highest concentration levels identified at the project site only. So, it can be concluded that even during operation of quarry the impact envisaged is moderate. The total increase in concentrations above baseline status to estimate the percentage increase is summarized in **Table 4-14**.

Table 4-14 Total Maximum GLCs due to Mining Activities without Control measures

Pollutant	Max. Baseline Conc. (µg/m^3)	Estimated Incremental Conc. (µg/m^3)	Total Conc. (µg/m^3)	NAAQ standard	% Increase
PM_{10}	67.6	3.29	70.89	100	4.86
$PM_{2.5}$	37.2	1.54	38.74	60	4.1
NO_X	40.6	2.51	43.11	80	6.1

4.2.12 Impacts due to Transportation

The Granite is transported to consumer directly as per buyer's requirement. The granite will be transported through existing road by tippers and approx. no. of trips required is 2 times per day.

The average saleable production will be about 8.7 m^3 per day, which is about 24.27 Tons/ day (bulk density of 2.8 Tones/m^3 or 3 Tonne per cubic meter). Considering an average carrying capacity of truck as 10 Tons, the number of truck trips will be about 2-3 trips per day. Further, considering an operating hours of 8 hours per day, about 1-2 trips will be flying on the nearby village road subject market condition. This minimum trip does not create impact on existing transportation.

4.2.12.1 Mitigation Measures

The increment in the dust emissions will be mainly due to Excavation &transportation activity. Therefore, emissions due to mineral handling during mining operation are not much and restricted to the lease area only. Proper mitigation measures are practiced during mining activities to control air pollution load below the prescribed limits are as follows:

- Regular water sprinkling on haul and access roads.
- Wet drilling will be followed.
- Watering of haul roads and other roads at regular intervals
- Provision of green belt by vegetation for trapping dust.

- Greenbelt development along the haul roads, dumps and along the boundaries of the lease area. Utmost care will be taken to prevent spillage of sand and stone from the trucks.

4.3 Water Environment

There are no surface sources viz. rivers/ lake within the proposed quarry lease area.

There will not be any ground water withdrawal, as the total water requirement is being metby authorized vendors or local panchayat. As the mine lease area is a Hilly area, the proposed mining will be carried out 30m from the top of the hill (above ground level). Hence, there will not be any groundwater level intersect. Therefore, ground water regime will be undisturbed. The list water bodies available within the 15km radius from the project site is provided in **Table 4-15.**

The existing water environment quality has been studied and the study results are discussed in **Section- Error! Reference source not found. o fChapter-3**, which show that generally the water quality in the area is well within statutory standards.

Table 4-15 List of waterbodies within the 15km radius of the project site

S. No	Description	Distance (km)	Direction
1	Lake near Puvanapalli	2.61	WSW
2	Lake near DoddeGaunapalli	3.58	NNW
3	Lake near Bitireddi	4.04	W
4	Kelamangalam Lake	4.09	NNW
5	Lake near Gopasandram	4.09	NNW
6	Lake near Narappanatti	5.17	S
7	Lake near Kelamangalam RS	5.33	N
8	Lake near Varaganapalli	5.46	E
9	Lake near D.Kottappalli	6.47	N
10	Lake near Tuppuganappalli	6.71	NE
11	Lake near Timmasandiram	6.99	SW
12	Nagamangalam Lake	7.41	E
13	Lake near Kommepalli	8.2	NNE
14	Lake near Uddanapalli	8.43	ENE
15	Lake near Denkanikottai	8.77	WSW
16	Panchapalli Dam	9.24	SSE
17	Lake near Jonbanda	12.27	N
18	Lake near Pillyakottur	13.97	NE
19	Lake near Kamandoddi	14.1	NNE
20	Lake near Eripanchapalli	14.34	SE

4.3.1 Anticipated Impacts

There are no surface sources and ground water regime will not be altered during mining. There would not be any impact if stored rainwater in the quarry pits is used for dust control. The major sources of water pollution due to this quarry operation will be as below:

- Domestic sewage from the mine.
- Deterioration in surface/groundwater quality of receiving body.
- Changes to hydraulic regime.

Impacts identification on water environment:

S.No.	Project Activity	Identify Aspects	Impacts	Significance / Consequence	Operation controls / mitigation measures
1	Excavation at site, movement of JCBs, other machinery, workers/labours etc.,	Consumption of water	Temporary and one time will be occurred	Impact will be low	Rainwater will be harvested in mined out pits for recharge/reuse.
2		Sewage generation	Temporary and one time will be occurred	Impact will be low	Domestic wastewater will be disposed through septic tank soak pit.

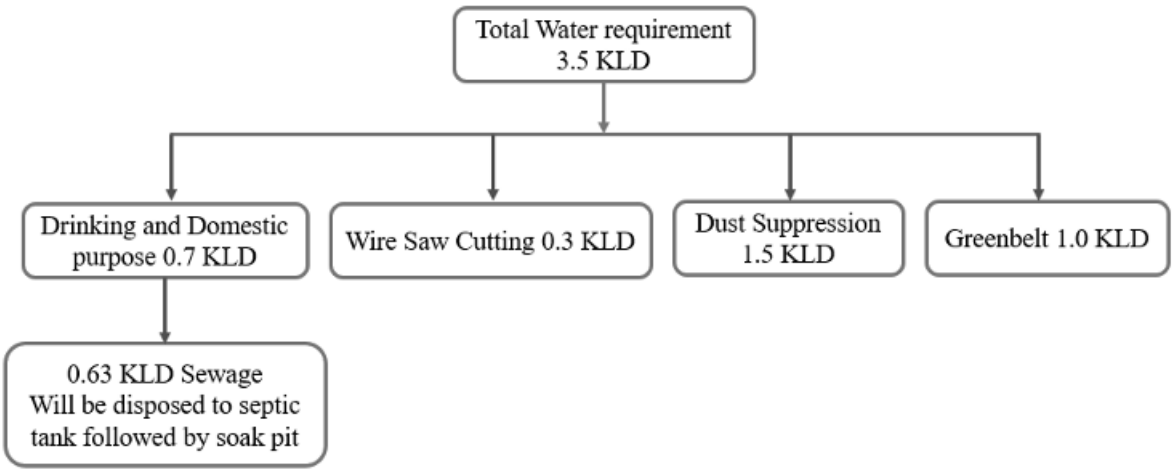


Figure 4-5 Water balance Chart

4.3.2 Mitigation Measures

4.3.2.1 Surface Water Pollution Control Measures

- There is no process effluent generation. The domestic sewage of 0.63 KLD is disposed through septic tank followed by soak pit.

- Construction of garland drains of suitable size around mine area and dumps to prevent rainwater descent into active quarry areas.
- During monsoon season, the rainwater is being collected by natural slope of area to water fed tank of the mine and it will be utilized for dust suppression and green belt development.
- The dump tops will be provided with inner slopes to control water flow to prevent erosion washouts. The dumps tops and slopes of active areas will be covered with grasses, shrubs, mulching, etc, to prevent erosion, till final backfilling of dumps into mine doutareas.
- Retaining walls of adequate dimensions will be provided at the top of dumps and theunstable OB benches within the mine to prevent wash off from dumps and sliding of material from benches. This will help in preventing silting of water drains/channels.
- The water channels/drains carrying the rainwater from the mine will be provided with baffles and settling pits to arrest the suspended solids, if any, present in this water
- The worked-out slopes will be stabilized by planting appropriate shrub/grass species on the slopes.
- The mine water will be regularly tested for presence of any undesirable elements and appropriate measures will be taken in case any element is found exceeding the limits prescribed by CPCB.

4.3.2.2 Ground Water Pollution Control Measures

- The domestic sewage from the toilets will be routed to septict anks.
- Regular monitoring of water levels and quality in the existing open wells and bore wells in the vicinity will be carried out.

4.3.2.3 Rainwater Harvesting

- The rainwater is being diverted towards the middle of the quarry to prevent water entering the quarry from working. The rainwater flows will also contain fines both from surface and waste dumps during seasonal flows. As such, it is being proposed to have structures in such away to act as settling pond and for rainwater harvesting.
- Construct barriers at suitable intervals along the path of the drains.
- Divert the water to de-silting cum rainwater harvesting pond in the mine area.
- Provide necessary overflow arrangement to maintain the natural drainage system.

4.4 Noise Environment

The source of noise during mining operation is loading and vehicular movement. Loading operations are intermittent during working hours, while vehicle movement is intermittent. The noise sources contribute to an increase in background noise levels.

The noise generated from various mining activities like drilling, loading, transport, etc. may cause significant increase in the ambient noise levels in the work zone surrounding the active mining benches. The noise levels will be decreased over distance and will reach acceptable levels outside the mine lease area. The increase in ambient noise levels may cause the following impacts.

4.4.1 Aspect – Impact identification on Noise Levels

S. No.	Project Activity	Identify Aspects	Impacts
1	Clearance of vegetation at site	Noise due to vehicular movement	One time temporary
2	Drilling, Blasting and Excavation	▪ Due to mining activities compressor and use of machineries for mining. ▪ Noise induced Hearing Loss (NIHL) to ▪ workers exposed to higher noise levels.	Moderate & Temporary Impact and it will be restricted to the mining activities duration
3	Stacking of mineral reject and handling	Generation of noise	Moderate & temporary impact and it will be restricted to the mining activities duration
4	Transportation of mining material	▪ Generation of noise due to mining activities ▪ Temporary Threshold Shift / Permanent Threshold Shift to workers exposed to higher noise levels. ▪ Disturbance in communication. ▪ Annoyance/irritation to the residents in nearby villages. ▪ Disturbance to the fauna residing in the area. ▪ Sleep disturbance to the residents in ▪ nearby villages	Moderate & Temporary impact and it will be restricted to the mining activities duration.

There are no industrial noise sources in the lease. There are no sensitive receptors like hospitals, schools, old age homes etc., within 500 km radial distance. The only source during

mine operation would be drilling, blasting and movement of quarrying machinery. Drillers would be exposed to about 75-80 dB(A).

4.4.2 Noise due to Drilling, Excavation and Transportation

The noise levels in the working environment will be maintained within the standards prescribed by the Occupational Safety and Health Administration (OSHA). These standards were established with the emphasis on reducing hearing loss. The permissible limits, as laid down by OSHA, are presented in **Table 4-16**.

Table 4-16 Permissible Exposure in Cases of Continuous Noise (OSHA, Govt. of India)

S. No	Sound Level (dB A)	Continuous Duration (Hours)
1	85	8
2	88	4
3	91	2
4	94	1
5	97	0.5
6	100	0.25

4.4.3 Noise Due to Blasting

Blasting activities are involved in this Quarry as a green belt will be developed around the mine which restricts the propagation of noise. The main source of noise in quarrying is the usage of machinery like excavators, mining tippers and compressors and diesel generators. Following mitigation measures should be taken to control noise pollution:

- Wherever the noise levels exceed 85dB(A), workers should be provided with earmuffs, earplugs etc.
- All vehicles and machinery will be properly lubricated and maintained regularly.
- Speed of the Vehicles entering and leaving the quarrying lease will be limited to 25 kmph.
- Unnecessary use of horns by the drivers of the vehicles shall be avoided.

4.4.3.1 Mitigate Measures

- Provision of suitable personal protective equipment (PPE) such as earmuffs and earplugs to Workers exposed to high noise generating operations/area.
- Job Rotation of workers working in the high noise area.
- Identification of High noise generating areas and marking with display board for warning.
- Periodical monitoring of ambient noise will be done as per CPCB guidelines.
- All the vehicles (including the transportation vehicle, Sprinkler, dumpers, and dozers
- etc.) and excavator will be properly maintained. Silencers in the Machineries will be provided to reduce the generation of noise.

- The Noise and vibrations mainly generated by mining machineries; background noise levels shall be kept in the range of 74-85 dBA.
- The noise sources shall not generate sound levels above 90 dBA.
- Equipment to be maintained in good working conditions.
- Drilling will be carried out with the help of sharp drill bits which will help in reducing noise.
- Green Belt development around infrastructure and mine areas etc., would minimize the adverse impacts likely to arise out of mining operations.

4.5 Impact of Vibration

Blasting activities are involved in Granite Quarry operations. The vibration during the moment of machinery will be minimal for a short span that will be well within the prescribed limits. Safety distance along the eastern side of lease area has been identified to utilized for afforestation. This will mitigate the Vibration.

4.5.1.1 MitigateMeasures

- Proper quantity of explosive, suitable stemming materials and appropriate delay system are to be adopted for safe blasting.
- Safe blasting zones are kept around the periphery of the quarry.
- Overcharging will be avoided. The charge per delay will be minimized and preferably a greater number of delays will be used per blast.

4.6 Impact on Human Settlement

There are no monuments or places of worship in the quarry area. Ground vibration and noise pollution is being maintained minimal and confined to the mine area. The quality of water on both surface and ground water is good and all parameters of drinking water are as per IS standards. Water quality analysis will be carried out at periodical intervals during post project monitoring.

The PM, NO_2 and SO_2 have been observed to be below the prescribed limit. Noise levels have also been found to be below the permissible limits at all the locations. Further, the noise generated in the lease area will be attenuated due to plantation and green belt all around the lease area. As preventive measures, greenbelt development around the mine lease area will be further strengthening for control of air emission to environment. All the employees when inducted will be medically examined. Further, they will also be medically examined at periodical intervals.

4.7 Biological Environment

4.7.1 Mining activities and their impact on biodiversity

Table 4-17 Impacts on Biodiversity

S. No	Activity	Examples of aspects	Examples of biodiversity impact
1	Extraction	Land clearing	Loss of habitat, introduction of plant diseases, Siltation of water courses
2	Blasting, Digging and hauling	Dust, noise, vibration, water pollution	Disruption of water courses, impacts on aquatic ecosystems due to changes in hydrology and water quality
3	Waste dumping	Clearing, water and soil pollution	Loss of habitat, soil and water contamination, sedimentation.
4	Air emissions	Air pollution	Loss of habitat or species
5	Waste disposal	Oil and water pollution	Encouragement of pests, disease transfer, contamination of groundwater and
6	Building power lines	Land clearing	Loss or fragmentation of habitat
7	Provision of accommodation	Land clearing, soil and water pollution, waste generation	Loss of habitat, sewage disposal and disease impacts
8	Access roads	Land clearing	Habitat loss or fragmentation, water logging upslope and drainage shadows down slope
9	Population growth	Land clearing or increased hunting	Loss of habitat or species, stress on local and regional resources, pest introduction, clearing
10	Water supply (potable or industrial)	Water abstraction or mine dewatering	Loss or changes in habitat or species composition

4.7.2 Existing Biological Scenario

- There will not be any adverse impact due to mining operations in this lease since only small production is involved from this lease and there will not be any major polluting source from the mining operations. Besides, all necessary mitigation measures will be implemented.
  - There is no perennial water body near the site and there will be no discharge of effluent from the mine.
  - In the Quarry area or its proximate areas there are no wetlands and the natural flow of water not available.
  - This area hosts common animals. Indian Dogs, Jungle and Domestic cat, Rhesus macaque, Domestic Cows, Buffaloes, Bullocks, and Goat etc. are found amongst

mammals. There are some Schedule species like Columba livia (Blue rock pigeon) – Sch – IV, Pavo cristatus (Indian peafowl) - Sch I (Part III), Sus scrofa (Wild boar)- Sch III, Mellivora capensis (Honey badger)- Sch I (Part I), Muntiacus muntjak (Southern red muntjac)- Sch III, Felis chaus (Reed cat) - Sch II (Part I), Viverricula indica (Small Indian civet) - Sch II (Part I), Paradoxurus hermaphroditus (Asian palm civet) - Sch II (Part I), Ratufa macroura (Grizzled giant squirrel) - Sch I (Part I) & Naja naja (Nalla Pambu) - Sch II (Part II) and some vulnerable species like Panthera pardus fusca (Indian leopard)- Sch I (Part I), Melursus ursinus (Indian bear) - Sch I (Part I), Bos gaurus (Indian bison) - Sch I (Part I), Albino gaur (White bison)- Sch I (Part I), Semnopithecus johnii (Nilgiri langur) - Sch I (Part I), Semnopithecus entellus (Gray langurs) - Sch I (Part I), Macaca radiata (Bonnet macaque) - Sch I (Part I), Tetracerus quadricornis (Four-horned antelope) - Sch I (Part I), Rusa unicolor (Sambar) - Sch I (Part I) and Chevrotains (Mouse-deer) - Sch I (Part I). There are few endangered species like Elephas maximus (Asian elephant) - Sch I (Part I), Macaca Silenus (Lion-tailed macaque) - Sch I (Part I), Cuon alpinus (Dhole) - Sch I (Part I), Scandentia (Tree Shrew) - Sch I (Part I) identified in the buffer zone of the study area. There are no rare species identified in the study area.

- There are no wild animals in the area. In the post mining stage, proper fencing will be carried in the mined-out area to prevent the fall of animals in the mine pits.
- There are not any wetlands, fish breeding grounds, or marine ecology near the quarry area, which will be affected due to this project.
- No such significantly important medicinal value species within the ML are as and its nearby region.
- There are not any wetlands, fish breeding grounds, marine ecology nearby the quarry area, which will be affected due to this project.

4.8 Green Belt Development

The objectives of the green belt cover will cover the following.

- Noise abatement
- Reuse of wastewater to the extent possible
- Prevention of soil erosion
- Ecological restoration
- Aesthetic, biological, and visual improvement of area due to improved vegetative and plantation covers.
- Green belt around mine, dumps, etc:
  - ✓ Tall growing, closely spaced, evergreen trees native to the area.
  - ✓ Easy, quick early growth and establishment
  - ✓ Trees with high foliage density, leaves with larger leaf area.

- ✓ Attractive appearance with both good flowering and fruit bearing.
- ✓ Bird and insect attracting species.
- ✓ Suitable green cover with minimal maintenance

- Avenue Trees:
  - ✓ Trees with conical canopy and with attractive flowering
  - ✓ Trees with medium spreading branches to avoid obstruction to the traffic.
  - ✓ Trees with branching at 10feet and above.

The green belt plantation programme will be continued till the end of the mining operation in the area. In framing out this programme on a sustainable and scientific base, due consultation and coordination with the forest department will be sought.

An area of 0.80.00 Hectare land was earmarked for greenbelt development during first 5 years of mining plan, at the end of life of quarry; TAMIN proposed to plant 1200 No's of trees around the lease area and Rs. 30,000/- per year will spend for proposed greenbelt development and maintenance.

Table 4-18 Proposed Greenbelt development Plan

Local Name of the Tree	Scientific Name of the Tree	Survival	No. of Species
Vaagai	Albizia Lebbeck	80 %	1200
Manjadi	AdenaantheraPavonina		
Aatru Poovarasu	Hibiscus Tiliaceous		
Panai	Borassus Flabellifer		
Yetti	StrychnosNuxvomica		
Purangai Naari, Pudanga Naari	Premna Tomentosa		
Magizha Maram	MimusopsElengi		
Puthranjivi	PuthranjivaRoxburghii		
Pisin Pattai	LitseaGlutinosa		
Sandhana Vembu	Toona Ciliate		
Eachai	Phoenix Sylvestre		

Plants are chosen to provide aesthetic, ecological and economical value. Trees will help to arrest propagation of noise and help to lessen dust pollution due to dust arresting action. Plants are chosen to provide aesthetic, ecological and economical value. Trees will help to arrest propagation of noise and help to lessen dust pollution due to dust arresting action.

4.9 Social Environment

4.9.1 Anticipated Impacts

Since the entire lease area of the project has no habitations or hutments in the core zone area, no rehabilitation or resettlement problems are involved. By adopting various mitigation measures as explained earlier, the environmental scenario in respect of ambient air quality, water quality, Noise levels, water aspects, biological aspects etc. during the operation of the project will be maintained within the statutorily prescribed levels. As such, impact due to the projects will be positive on socio-economic aspects. It will be ensured that the buffer zone of the quarry will be properly preserved environmentally in all respects within sustainable limits through necessary monitoring. The project will be operated with care for minimizing environmental impacts with proper EMP measures for pollution control.

Indirectly scores of people will be benefited by gainful indirect employment opportunities through various service-related activities connected with the project operations as shown under.

4.9.2 Corporate Environmental Responsibility

TAMIN Jakkery site had no Relocation and Rehabilitation. Most villages have benefitted mutually at Jakkery where the mining industry has provided indirect jobs for labour and villages provide accommodation for the labour and staff. Supportive industries like food supply and essential shops are economic growth in the villages. The site has provided road access to a few nearby village sites. 2% from the Total Project cost will be used for CER activities as the committee recommendation during Public Hearing.

4.9.3 Other benefits to Community

- Project related logistical operations.
- Various strading services for consumer goods, spare parts, sundry items, etc.,
- Contractual services connected with the project.
- Greenbelt works in the project.
- Casual labour is needed for various activities.

The project will provide ample opportunity to the local people for direct and in-direct employment. The proposed project may create opportunities for indirect employment in the field of vehicle hiring, labours, trading of construction materials, carpenters etc. The major areas which required immediate attention relates to infrastructure support, health & sanitation, Anganwadi services, school education, youth development, income generation activities & veterinary services.

4.10 Impacts on Occupational Health due to project operations

Anticipated occupational illness sequel to mining activities involved in the project. Occupational health problems due to dust &noise and Occupational illness by quarry activities as follows.

- Dust related pneumonia
- Tuberculosis
- Rheumatic arthritis
- Segmental vibration

4.10.1.1 Mitigate Measures for Occupational Health

- Adoption of dust suppression measures like spraying water, use of drill with dust collection system or wet drills etc.
- Plantation
- Avoid blasting during unfavorable wind & atmospheric conditions.
- Use of personal protective equipment. Compliance with DGMS circulars.
- Emergency response plan that includes installation of emergency response equipment to combat events such as fire.
- All personnel required to handle hazardous materials will be provided with personal protective equipment suitable for the hazardous material being handled.
- On-site first aid facilities will be provided, and employees will be extended to the local community in emergencies.

Table 4-19 Mitigation for occupational health and safety

S. No	Activity	Mitigation measures
1	Excavation	Planned excavation, avoid haphazard mining
2	Drilling and blasting	The operators and other workers should be provided with masks, helmets, gloves, and earplugs.
3	Safety zone	Provisions for a buffer zone between the local habitation and the mine lease in the form of a green belt of suitable width. Restricted entry, use of sirens and cordoning of the lasting area are some of the good practices to avoid accidents.
4	Overburden stabilization	Accidents are known to happen due to overburden collapse. Therefore, slope stabilization and dump stability are critical issues for safety and environment.
5	Worker's health surveillance	Health survey program for workers and the local community. Regular training and awareness of employees to be conducted to meet health and safety objectives.

4.10.1.2 Physical Hazards

- Traumatic injury remains a significant problem and ranges from the trivial to the fatal. Common causes of fatal injury include rock fall, mobile equipment accidents, falls from height, entrapment, and electrocution.
- Noise is almost ubiquitous in mining. It is generated by drilling, blasting, materials handling and ore transportation. Controlling noise has proven difficult in mining and noise-induced hearing loss remains common.
- Whole body vibration is commonly experienced whilst operating mobile equipment, such as load, haul, dump units, trucks, scrapers, and diggers.
- Poorly maintained roads and vehicles contribute to the problem. Hand arm vibration syndrome is also encountered with the use of vibrating tools such as air leg rock drills.

4.10.2 Biological Hazards

- The risk of tropical diseases such as malaria and dengue fever are substantial at some remote mining locations. Leptospirosis and ancylostomiasis were common in mines, but eradication of rats and improved sanitation has controlled these hazards effectively.

4.10.3 Ergonomic Hazards

- Although mining has become increasingly mechanized, there is still a substantial amount of manual handling. Cumulative trauma disorders continue to constitute the largest category of occupational disease in mining and often result in prolonged disability. Broken ground is often encountered and can cause ankle and knee injuries.

4.10.4 Psychological Hazards

- Drug and alcohol abuse has been a difficult issue to deal with in mining. Debate continues about how to measure psychophysical impairment. Nevertheless, mining operations commonly require the measurement of urinary drug metabolites and breath or blood alcohol on pre-employment and following accidents. Remote locations are common in mining with mine employees separated from their families and communities during work periods.
- Expatriate placements are also common in mining and the associated psychosocial hazards have been reviewed recently. Unfortunately, fatal, and severe traumatic injuries continue to occur in mining and often have a profound impact on morale. Post-traumatic stress disorders sometimes develop in witnesses, colleagues, and managers. Registered managers often feel personally responsible for such injuries, even in the absence of negligence, and face the ordeal of government inquiries and legal proceedings.

4.10.5 Mitigation Measures

- To reduce pollution emanation from quarry operations, carry out splitting of sheet rock by diamond wire saw which largely reduces the dust and noise generation.
- Adoption of dust suppression measures like spraying water, use of drill with dust collection system or wet drills etc.
- Water sprinkling on haul roads and dumping yards, etc.
- Green belt creation wherever possible to arrest dust and reduce noise propagation.
- All staff and workers will be provided with PPE to guard against excess noise levels.
- Provision of safety Helmets, goggles, safety boots, earmuffs, gas masks, etc.
- To provide appropriate instruction, training, retraining, vocational training, etc.
- Organization of safety contests and safety campaigns regularly to update knowledge of safe operational procedures, etc.
- Observation and compliance of all precautions, control measures and stipulations on the above lines will ensure that in this project, health and safety problems will be minimal.
- Plantation
- Avoid blasting during unfavorable wind & atmospheric conditions.
- Compliance with DGMS circulars.
- Emergency response plan that includes installation of emergency response equipment to combat events such as fire.
- All personnel required to handle hazardous materials will be provided with personal protective equipment suitable for the hazardous material being handled.
- On-site first aid facilities will be provided, and employees will be extended to the local community in emergencies.
- Health Check programsperiodically (1 Year Once).

4.11 Traffic Density

Average production is 2500 m^3/annum of Granite. Considering an operating calendar of 240 days per year. Considering the recovery of the dimensional stones from the quarry is less than 25% and as the boulders exposed from the bottom of the existing pits exhibit better quality when compared to the excavated boulders, conservative estimation is made with 25% recovery. The average saleable production will be about 8.7 m^3 per day, which is about 24.27 Tons/ day (bulk density of 2.8 Tones/m^3 or 3 Tonne per cubic meter). Considering an average carrying capacity of truck as 10 Tons, the number of truck trips will be about 2-3 trips per day. Further, considering operating hours of 8 hours per day, about 1-2 trips will be flying on the nearby village road subject market condition. This minimum trip does not create impact on existing transportation.

4.11.1 Mitigation Measure

Traffic will be regulated using flagging. The trucks carrying the materials will be covered with tarpaulins, to avoid any spillage along the haulage road. All tippers/ trucks will be periodically checked to confirm exhaust norms. Traffic signages will be provided. A flagger will manage traffic at convergence point of the approach road and national highway to avoid possible mishap.

5 ANALYSIS OF ALTERNATIVES

5.1 Alternate Technology

Semi mechanized opencast method will be used for mining. No alternative technology will be envisaged for this proposed project.

5.2 Site Studies

The proposed project is site specific. The proposed area is classified as Government land and a lease has been obtained for mining the granite material by following the Open Cast Semi-Mechanized Method.

The proponent and the Geologist/RQP have inspected the site and studied the occurrence of Granite deposits at the site and other geological features in order that the same could be mined safely, economically and in an environmentally friendly manner. Mapping of Granite was completed. Then section wise details of reserves were worked. There is no mining being carried over the lease at present.

5.3 Method of mining

5.3.1 Opencast Method

Other alternatives for methods of opencast mining like manual mining would be unscientific and economically not viable. Semi mechanized opencast method will be used for mining. No alternative technology will be envisaged for this proposed project.

Open cast, semi-mechanized mining with 6m vertical bench with a bench width is 6m with vertical slope. Under regulation 106(2) (a) of the Metalliferous Mines Regulation 1961 in all open cast working in hard ore body, the benches and sides should be properly benched and sloped. The height of any bench shall not exceed 6m and the width thereof shall not be less than the height. The benches shall be sloped at an angle of more than 45° from the horizontal.

5.4 Connectivity

The Nearest Railway stations are PeriyaNagathunai Railway Station~4.08Km, E. The project site is adjacent to SH - 85 i.e. Attibelle - Royakottai Road which is approximately 2.19 km (NNE). The NH-44 Srinagar (Jammu & Kashmir) - Kanyakumari (Tamilnadu) ~ 14.45Km (NNE). The nearest airport is Kempegowda Int. Airport is about ~69.75Km, N and Hosur Airport at ~14.31Km, NW. Road connectivity is shown in **Figure 5-1.**

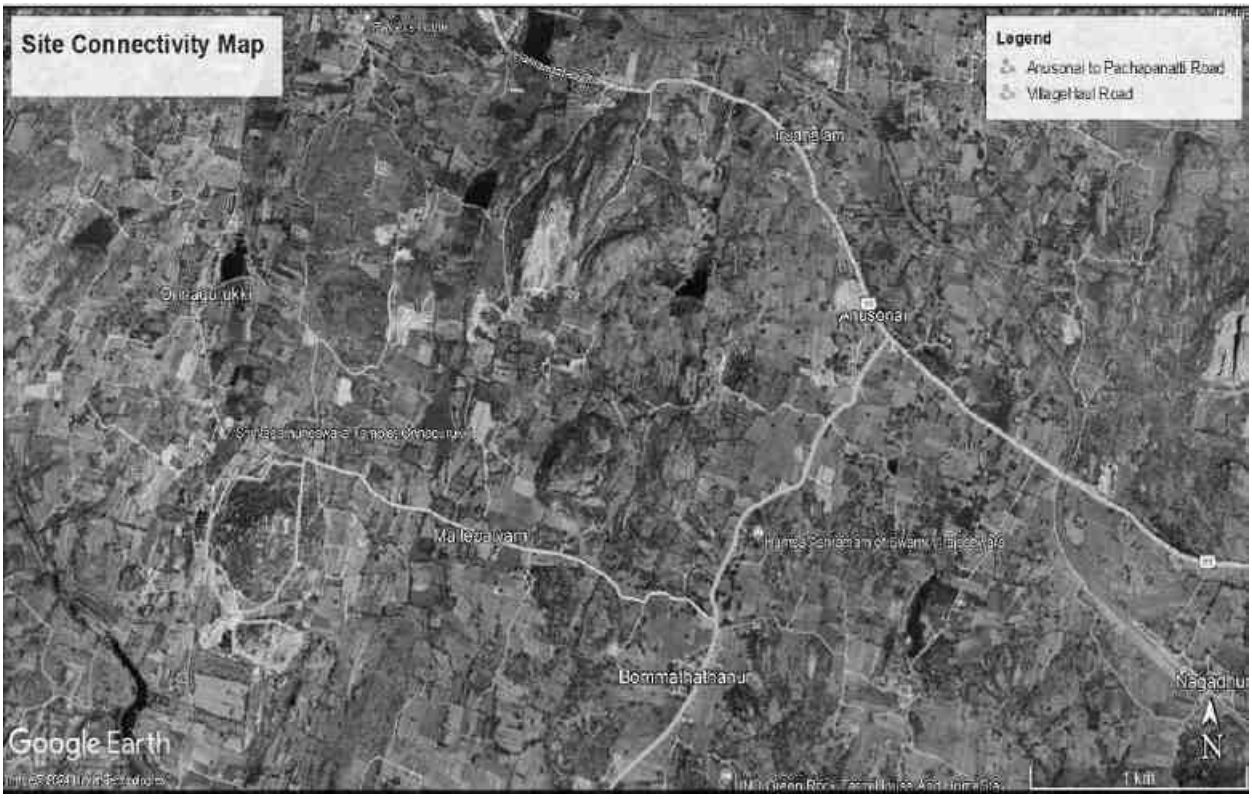


Figure 5-1 Road Connectivity for quarry area

6 ENVIRONMENTAL MONITORING PROGRAMME

6.1 General

Environmental monitoring is the measurement of environmental parameters at regular intervals over an extended period. Monitoring allows the assessment of environmental and biological changes in an ecosystem. All the project activities shall be monitored to ensure that appropriate environmental mitigation activities are being implemented and to identify areas where Environmental Management Plan compliance is not satisfactory. Hence, Environmental quality monitoring of critical parameters is very essential in the routine activity schedule of project operation.

The mitigation measures suggested in **Chapter 4** will be implemented to reduce the impact on the environment due to the operations of the project. The monitoring schedules are planned for systematic study of various pollution levels with respect to air and water qualities, noise levels, etc. to ensure that they conform to the standards laid down by Environmental Protection Act and various Central and State Pollution Control Board Limits. The various methodologies and frequency of studies of all environmental quality parameters also conform to norms laid down by MOEF, CPCB and SPCB in this respect.

The Project proponent will be overseeing/reviewing following activities:

- Too serve the implementation of environmental control measures.
- To ensure implementation of planned plantation program with monitoring of survival rate, etc.
- To keep monitoring records properly for submission of periodical returns to statutory authorities and for checking by them.
- To evaluate periodically the performance of existing pollution control equipment and systems for taking promptaction in this respect to rectify the defects.
- Conducting safety audits and programs to create safety awarenessinworkers/staff.
- Monitoring of dumps and benches for slope stability, monitoring of OB dumps, laying of check dams, garland drains around the dumps and excavated areas and theirregularmaintenanceforde-silting.
- To study the effects of project activities on the environment.
- To interact and liaise with State and liaise with State and Central Government Departments.
- To take immediate preventive action in case of some unforeseen environmental pollution attribute able to the project.
- Impartingtraining onsafetyandconducting safetydrillstoeducateemployees.
- To ensure that fire fighting equipment, etc, is kept in ready-to-use condition.

For each of the environmental attributes, the monitoring plan specifies the parameters to be monitored, location of monitoring sites, frequency and duration of monitoring and it also denotes the applicable standards, implementation, and supervising responsibilities.

6.2 Objective of Monitoring Program

- Evaluate effectiveness of implementation of mitigation measures identified **in Chapter 4.**
- Measure effectiveness of operational procedures
- Confirm statutory and mandatory compliance.
- To verify the result of the impact assessment study with regards to new developments.
- To follow the trend of parameters which have been identified as critical.
- To check or assess the efficiency of controlling measures.
- To ensure that new parameters, other than those identified in the impact assessment study, do not become critical through the commissioning of new project.
- To monitor effectiveness of control measures.
- Regular monitoring of environmental parameters to find out any deterioration in environmental quality.

6.3 Monitoring Schedules for Various Environmental Parameters

The proponent shall adopt the following monitoring schedule for environmental parameters. However, based on the need and priority it may be suitably modified / improved. However, since the proponents are different, monitoring, fulfilling of all the statutory obligations and maintaining records are to be carried out separately by the proponents.

Post-project monitoring is an equally important aspect in the Environmental Management Plan. To verify the outcome on the implemented mitigation measures and to alter the proposed mitigation, Post project monitoring becomes inevitable. Environment monitoring plan is given in **Table 6-1.**

Table 6-1 Post Environmental Monitoring Plan

S. No	Parameters	Measurement Methodology	Frequency	Location	Data Analysis	Reporting Schedule
1	Ambient air monitoring of parameters specified by CPCB consents from time to time (PM10, PM2.5)	IS 5182 & CPCB Guidelines Vol. 1 (Gravimetric Method)	Monthly	2 Stations (In downwind)	Comparison with specified limits and previous baseline data of the area if available	Compliance report of EC to MOEF&CC on 6 monthly basis and compliance report of consent to CPCB as per requirement. Reports to be sent to top management and the process manager as well.
2	Maintaining record of water consumption	SOP of maintaining record of water consumption for water sprinkling for dust suppression	Daily	At site and approach road	Comparison of water consumption against EC	Compliance report of EC to MOEF&CC on 6 monthly basis and Compliance report of consent to CPCB as per requirement Reports to be sent to top management and the process manager as well.
3	Monitoring of GW	APHA: 23rd Edition, 2017	Twice in a year	At nearest habitation	Comparison with specified limits	Compliance report of EC to MOEF&CC 6 monthly basis and Compliance report of Compliance report of consent to CPCB as required
4	Noise monitoring	EPA	Monthly	2 locations at site and nearest habitation	Comparison with specified limits	Compliance report of EC to MOEF&CC on 6 monthly basis and Compliance report of consent to CPCB in case as per requirement Reports to be sent to top management and the process manager as well.
5	Greenbelt development	Survival rate of Plant	Regular	At site	Replantation of dead species and water consumption	Compliance report of EC to MOEF&CC on 6 monthly basis and Compliance report of consent to CPCB in case on as per requirement Reports to be sent to top management and the process manager as well.

6	Soil Monitoring	IS: 2720 & Laboratory Standard Methods	Once in Year	2 locations at site and nearest cultivation land	Comparison with specified limits	Compliance report of EC to MOEF&CC on 6 monthly basis and Compliance report of consent to CPCB in case on as per requirement Reports to be sent to top management and the process manager as well.
7	Readiness for Emergency Response	Conduct mock drill in presence of observer	Once in Year	Various location in mining area	Mock drill report for identifying deficiency and opportunities for improvement	Mock drill report sent to Management as and when mock drill conducted
8	Occupational Health programs	Mine Regulations, 1961 and Circulars of DGMS	once in 3 Years	Entry level and once in 3 Years	Audiometric test and pre-placement & periodical medical testsas per Mine Regulations, 1961 and Circulars of DGMS	Compliance of Mine Regulations, 1961 and Circulars of DGMS

6.3.1 Occupational Health and Safety

- Occupational health surveys of staff and permanent workers will be undertaken at least once in 3 years to detect early incidence of diseases and for prompt remedial medical follow up in the matter. Audiometric tests for the workers will be done at regular intervals for workers in the no is prone area. Safety matters also will be reviewed periodically by the safety in-charge.

- Occupational health and safety are very closely related to productivity and good employer-employee relationships. The main factors of occupational health in mines are fugitive dustand noise. Safety of employees during blasting operation and maintenance of mining equipment and handling of explosive materials is to be taken care of as per the Mine Regulations, 1961 and Circulars of DGMS. To avoid any adverse effects on the health of workers due to dust, heat, noise and vibration, sufficient measures have been proposed in the EMP.These include:

    - ✓ Provision of wet drilling/ or dust collectors
    - ✓ Provision of rest shelters for mine workers with amenities like drinking water, fans, toilets etc.
    - ✓ Provision of personnel protection devices for the workers
    - ✓ Rotation of workers exposed to high noise areas.
    - ✓ First-aid facilities

7 ADDITIONAL STUDIES

7.1 Introduction

The additional studies involved in this project will consist of following aspects:

- Public consultation
- Risk Identification and Management/Occupational Health and safety studies have been conducted and a safety plan was prepared.
- Disaster Management Plan
- Mine closure plan as per GCDR 1999

7.1.1 Public Consultation

The proposed project is categorized as 'B1' Violation category Schedule 1(a) as per EIA Notification 2006 and its amendments thereafter. The total area of the quarry is 27.04.5Ha. However, the proposed project falls under 'B1' Violation category, Public Hearing is Mandatory. So, the EIA report has been prepared as per the obtained ToR vide Identification No. TO24B0108TN5942228N, dated: 21.09.2024. The Baseline studies are carried out during the period of March 2024 – May 2024. Draft EIA report will be submitted for Public Hearing (PH). After PH, the minutes obtained will be incorporated in the EIA report along with action plan by the proponent towards issues raised by during Public Hearing. Final EIA will be submitted to TNSEAC for further appraisal of the project and obtaining Environment Clearance.

7.1.2 Risk Identification & Management

7.1.2.1 Introduction

Mining and allied activities are associated with several potential hazards both to the employees and the public at large. A worker in a mine should be able to work under conditions that are adequately safe and healthy. At the same time the environmental conditions should be such as not to impair his working efficiency. The various safeguards to be taken to ensure the safety of the mine and that of employees are provided in the Mines Act, 1952. Risk involves the occurrence or potential occurrence of some accidents consisting of an event or sequence of events. The risk assessment study covers the following:

- Identification of potential hazard areas.
- Identification of representative failure cases.
- Assess the overall damage potential of the identified hazardous events and the impact zones from the accidental scenarios.
- Assess the overall suitability of the site from a hazard minimization and disaster mitigation point of view.

- Furnish specific recommendations on the minimization of the worst accident possibilities.
- Preparation of broad DMP, On-site and Off-site Emergency Plan.
- Occupational Health and Safety Plan.

The complete mining will be carried out under the management control and direction of a qualified mine manager holding a first – class manager's certificate of competency. Moreover, mining staff will be sent to refresher courses from time to time to keep them alert. However, following natural/industrial hazards may occur during normal operation:

- Accident due to explosives
- Accident due to heavy mining equipment; and
- To take care of the above hazard/disasters, the following control measures will be adopted.
- All safety precautions and provisions of the Mine Act, 1952, the MMR 1961 and the Mines Rules, 1955 will be strictly followed during all mining operations.
- Entry of unauthorized persons will be prohibited.
- Firefighting and first-aid provisions in the mine's office complex and mining area.
- Provision of all the safety appliances such as safety boots, helmets, goggles etc. will be made available to the employees and regular check for their use.
- Training and refresher courses for all the employees working in hazardous premises; under mines rules all employees of mines will have to undergo the training at a regular interval.
- Working off mine, as per approved plans and regularly updating the mine plans.
- Cleaning of mine faces will be regularly done.
- Regular maintenance and testing of all mining equipment as per manufacturer's guidelines.
- Suppression of dust on the haulage roads
- Increasing the awareness of safety and disaster through competitions, posters, and other similar drives.
- For any type of above disaster, a rescue team will be formed by training the mining staff with specialized training.

In this quarry lease applied area, the quarrying does not involve disaster of land etc. In the event of natural calamities like floods and cyclones, the applicant will approach; the Revenue officials will be informed.

The area does not come under earthquake zone. There is no chance of flooding water into working because the area is located away from the rivers at located place compared to the surroundings. The area is formed by massive formation with gentle slopes, there are no

chances for land sliding in the quarry. If there are any chances for disasters, the applicant will take necessary action to prevent the same as per statutory requirement.

The applicant has established a First Aid Room with Emergency Medicines in the event of any minor disaster to the workers. The applicant has sufficient vehicles for taking the injured / ill health persons to the nearest hospitals.

7.1.2.2 Identification of Hazards in Open Cast Mining

There are various factors which can cause disaster in the mines. These hazards are as follows:

- Drilling
- Blasting
- Handling of materials
- Heavy Machinery

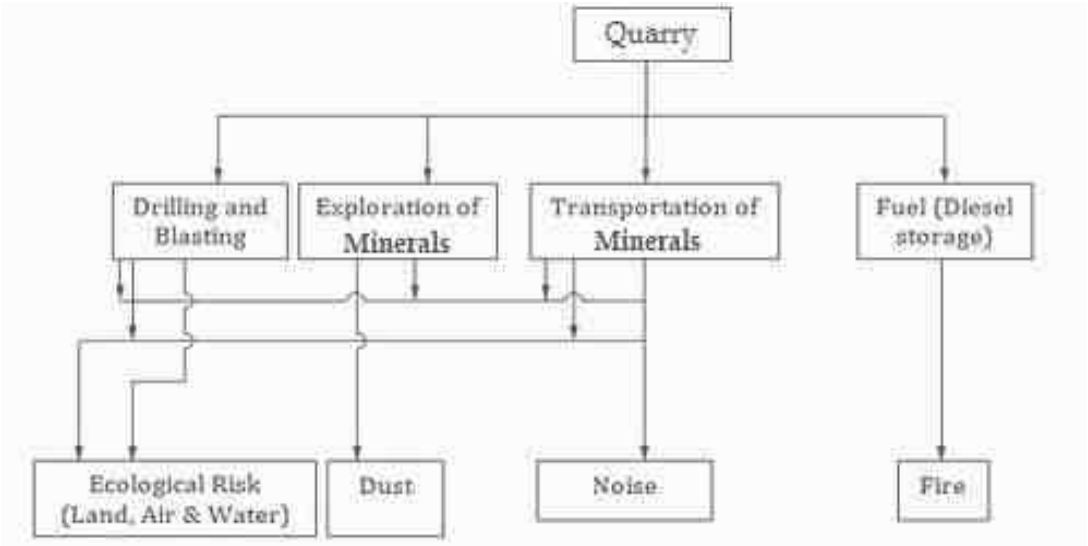


Figure 7-1Identification of hazards in opencast mine

7.1.2.3 Drilling

Drillholesof1.5–3.0mdepthwillbedrilledinastaggeredpatternat3minterval:

- Drill hole diameter :32mmupto1.5–3.0mlong
- Depth and inclination of drill hole: Generally drilled vertically inAlignment.
- Explosivetype: DetonatorFuse

Drilling will be done with jack hammers. The conventional 32mm dia, blast holes are drilled perfectly parallel to each other at 20 to 25cm intervals without any hole deviations, all along the required plane of splitting. The holes are drilled up to a depth a few cm above the required horizontal plane.

7.1.2.4 Blasting

Separation of the horizontal (bottom) and the vertical (length side) planes by serial blasting simultaneously along the above two planes by using 32mm dia. blast holes charged with mild explosive like gun powder or detonating. The process continued aiming at the liberation of huge volume of the granite body from the parent sheet rock is called 'Primary Cutting'.

7.1.2.5 Secondary Splitting

The 'Secondary Splitting' into required size involves long hole drilling up to the bottom of the separated block along the required planes for which mostly rock breaking powder or expansion mortar is used for splitting. It is chemically called 'Calcium Hydroxide' Ca $(OH)_2$. Removing the defective portions and dressing into the useful dimensional blocks are done manually using feather and wedges and chiseling respectively by the laborers who are skilled in this work.

The defect free rectangular shaped dimensional stones as acceptable consumers are produced by the method described above, which is constantly supervised by experienced Mining Geologist and Mining Engineer.

7.1.2.6 Heavy Machinery

Most of the accidents during the transport of dumpers proclaim and dozers and other heavy vehicles are often attributable to mechanical failure and human errors.

7.1.2.7 Overburden Handling

The waste materials generated during mining activity include rock fragments of different angularity formed. during the removal of naturally defective and uneconomical portions of the deposits and the working waste formed during dressing of the extricated blocks. During the first five years of the Mining Plan period such waste materials are proposed to be dumped along the South side of the lease area where it comprises of country rock terrain.

7.1.2.8 Storage of Explosive

The explosive requirement of the quarry operation is minimal. The blasting requirement will be carried out using contractors approved by the Controller of Explosives. No Explosive storage is envisaged in this quarry.

7.1.2.9 Fuel Storage

Most of the HEMM will operate on diesel. However, no major storage is envisaged at the mine Lase area. A diesel tanker will be provided for the crawler mounted machines operating in the mine.

7.1.2.10 Water Logging

Water logging in them in site have been avoided by adopting following measures.

- Correct marking of position of water bodies with their highest flood level and

keeping the mine protected by suitable bunds.

- Water from the surface water bodies shall not enter the mines.
- Draining of mine water by suitable capacity pumps

7.1.2.11 Safety Measures at the Proposed Open Cast mining Project

- The opencast mine has been planned for working with shovel dumper system which requires proper benching not only for slope stability but also for movement of dumpers and other heavy machinery. The inclination of the quarry sides at the final stage i.e., at the dip most point will not exceed 45° to the horizontal. (This angle is measured between the line joining the toe of the bottom most bench to the crest of the topmost bench and the horizontal line).
- The quarries will be protected by garland drains around the periphery for storm water drainage.
- A minimum safe distance of 100m will be kept between the surface edge of the quarry and the nearest public building, roads etc. When the surface edge of the quarry approaches within a limit of 200m from any road, public building special permission from DGMS will be taken to conduct controlled blasting to prevent damage/injury to public life and property.
- All mining operations both within the quarry and outside will be conducted as per the conditions laid down by DGMS and under strict supervision of competent persons appointed under Metalliferous Mine Regulation Act, 1961.

7.1.2.12 Measures Suggested to Avoid Accidents due to Blasting

- The blasting operation shall be supervised by a competent person appointed for the purpose.
- The blasting operation shall be strictly conducted as per the guideline given in metalliferous mine regulation, 1961.
- Demarcation of danger zone area falling within a radius of 300 m from the blast site.
- All employees and equipment shall be cleared from the blast area and removed to a safe location prior to any scheduled blasting.
- To prevent unauthorized entry, guards shall be posted at all access points leading to the blast area; and
- Audible signals such as sirens, whistles, etc. shall be used to warn employees, visitors, and neighbors about the scheduled blasting event.
- Only controlled blasting will be done to minimize damage to the nearest structure.

7.1.2.13 Measures to Prevent Failure of Overburden Dump

- In flat areas where the dumping operations have come to an end, the slope angle

should be flattened by about 15° lower than the angle of repose which varies from the site to site but not less than 25°.

- Planting vegetation as early as possible over the overburden dump slopes.
- Provide drainage channels along the overburden dump toe for additional protection, in such a way that 15m should be maintained left between the overburden dump and the bench.
- If a mine is abandoned, the bench and overburden dump should be separated from each other by digging a trench of 6 to 10m width.

7.1.2.14 Precautionary Measures to Prevent Accidents due to Trucks & Dumpers

- All transportation within the main working shall be carried out directly under the supervision and control of the management.
- The vehicles must be maintained in good condition and checked thoroughly at least once a week by the competent person authorized for the purpose by the Management.
- Road signs shall be provided at each turning point, especially for the guidance of the drivers.
- To avoid danger while reversing of vehicles especially at the embankment and tipping points, all areas for reversing of lorries should as far as possible be made man free.
- The statutory provision of fences, constant education, training etc. will go a long way in reducing the incidents of such accidents.
- Generally, oversize rocks shall be dealt with in the pit by secondary blasting.
- A Load consisting of large rocks must not be over the edge. This is unsafe and may damage the equipment.
- The movement of the dumpers will be governed under the Code of Traffic rule, this is already formulated & implemented.

7.1.3 Disaster Management Plan

The disaster management plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. For effective implementation of the disaster management plan, it should be widely circulated and personnel training through rehearsals/drills. The objective of the disaster management plan is to make use of the combined resources of the mining operation and the outside services to achieve the following:

- Effect the rescue and medical treatment of casualties.
- Safeguard other people.
- Minimize damage to property and the environment.
- Initially contain and ultimately bring the incident under control.

- Identify any dead.
- Provide authoritative information to the news media.
- Secure the safe rehabilitation of affected areas.
- Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency.
- In effect, it is to optimize operational efficiency to rescue rehabilitation and render medical help and to restore normalcy.

EmergencyOrganization (EO)

It is recommended to set up an emergency organization. A senior executive (Mine Manager) who has control over the affairs of the mine would be heading the emergency organization. He would be designated as site controller. As per the general organization chart, in the mines, the Mines Foreman would be designated as the Incident Controller (IC). The incident controller would be reporting to the site controller. Emergency coordinators would be appointed who would undertake the responsibilities like firefighting, rescue, rehabilitation, transport and provide essential and support services.

Emergency Communication (EC)

Whoever notices an emergency such as fire, growth of fire etc. would inform the Mines Foreman. The Mines Foreman would appraise the site controller. Site Controller verifies the situation from the incident controller takes a decision about an impending on-site emergency. Simultaneously, the emergency warning system would be activated on the instructions of the site controller.To handle disaster/emergency situations, the following personnel shall deal with the disaster/Emergency.

- Mines Manager-site controller
- Mines Forman-incident controller
- Mine mate –Fire controller
- Senior most Driver-Transport coordinator
- Senior most operator- Medical coordinator

7.1.3.1 Emergency Services

This includes the fire-fighting system, first aid center, etc. Alternate sources of power supply for operating fire pumps, communication with local bodies, fire brigade etc. will also be clearly identified. An adequate number of external and internal telephone connections shall be installed.

- Fire Protection System
- Off Site Emergency Plan

7.1.3.2 Fire Protection System

The fire protection system for the project maintained will consist of Portable hand appliances of suitable types/capacities for extinguishing small fires in selected mine areas, storages areas such as that of Diesel, Explosives, etc.

7.1.3.3 Off-Site Emergency Plan

The offsite emergency plan defining the various steps to tackle any offsite emergencies, which may affect surrounding areas of the project, must be prepared after due finalizing discussion in this respect with local Panchayat official, Revenue officials and District Collector. As per this off-site plan, in case of any off-site emergencies, actions must be promptly initiated to deal with the situation in consultation with Collector and other revenue officials.

7.1.4 Progressive Quarry/Mine Closure Plan

Land degradation is one of the major adverse impacts of opencast mining in the form of excavated voids and in the form of waste dumps. As per the Petro genetic character, the depth persistence of the weathered rock, Road metals and boulders body in the area is beyond the workable limits. The proposed mining plan, only 30m has been envisaged as 'Workable depth' for safe and economic mining.

However, it is proposed not to back fill the ultimate pit, in as much as quantity of reserves is available below the workable depth of 30m and there is possibility of technological up-gradation in mining for greater depths.

There is no proposal for back filling, reclamation, and rehabilitation. The quarried pits after the end of the life of lease will be fenced to prevent inherent entry of public and cattle.

7.1.4.1 Progressive Mine Closure Plan

In the Colour Granite Quarry operations proposed bench height of 6m for the first five years and 30m during the entire life of the quarry, hence the ground water will not be disturbed in any manner. Afforestation will be carried out and maintained in the safety barrier till the plants reach the stabilize level. The Sludge from the toilet will be periodically removed and the same will be used as manure for afforestation.

It is proposed not to back fill the ultimate pit. In as much as good quality of reserves is available below the workable depth of 30m and there is possibility of technology of up gradation in granite mining for greater depths in course of time for safe mining at economic cost beyond 30m depth. The pit boundaries will be fenced and used for agricultural purposes when the pit is filled with underground seepage or rainwater.

7.1.4.2 Water Quality Management

The ground water quality in the region indicates neutral range with pH values. Most of the analytical results for ground and surface water showed parameter concentrations well within the permissible limits. Garland drains will be provided all along the periphery of the mining pit and along the toes of the sidedumps. These drains will be aligned in such a way that all the surface drainage water will be carried away from the mining zone to settle tanks. The mining pit's catchment water will be coursed to the main sump and used for dust suppression and green belt development & plantation activities.

7.1.4.3 Mines Seepage Water

The negligible seepage of water in the mining pit will be collected in a well-guarded pond / sump for settling of solids. The treated water will be used for dust suppression on working faces, haul roads and dump surfaces.

The lease applied area is a hillock with a height of 18m. Though the area receives scanty average rainfall of 985mm per annum during both Southwest and Northeast monsoons. Though the area receives scanty rainfall, the ground water level is at 15m depth. During the rainy seasons the surface run of water and the ground water are collected at one point called as sump and dewatered nearby agricultural field with the help of 10 HP oil engines.

7.1.4.4 Air Quality Management

Ambient air quality was monitored twice a week for One (01) season (shall cover 12 weeks), i.e., during Pre-Monsoon season. PM_{10}, $PM_{2.5}$, SO_2, NOx, were monitored. Sampling was carried out as per Central Pollution Control Board (CPCB) monitoring guidelines at each location. The following precautions have been considered for a batement of air pollution in the proposed m ining area:

- Water sprinkling shall be carried out at the active working faces, on all haul-roads and the dump surfaces.
- Regular cleaning and removal of spillage colour granite from haul roads and weighbridge areas.
- Proper and regular maintenance of mining Equipment's.
- Development of comprehensive green belt around overburdendumps to reduce fugitive dust emissions to create clean and healthy environment.

7.1.4.5 Solid waste Management

As is stated earlier, mining is being carried out by opencast semi-mechanized method using conventional mining equipment'si.e., hydraulic excavators / shovels and dumpers combination with ancillary mining equipment like compressor, wire cutting machine, generator etc.

Total waste to be generated during the five years of Mining Plan period will be 31,204 m^3. The waste material will be dumped on the western side of SF. No. 486(Part) of the lease applied boundary. The dumps will be maintained not exceeding 5m height and the angle of slope of dumps will be at 45° from horizontal.

Rubble generated as granite rejects during the production works and the waste fragments generated during development works will be utilized for forming approach road and dumping yard purposes. Adequate space has been identified within the lease applied area for dumping such waste material on barren land covered with soil.

7.1.4.6 Mine Drainage

The lease applied area is a hillock with a height of 18m. Though the area receives scanty average rainfall of 985mm per annum during both Southwest and Northeast monsoons. Though the area receives scanty rainfall, the ground water level is at 15m depth. During the rainy seasons the surface run of water and the ground water are collected at one point called as sump and dewatered nearby agricultural field with the help of 10HP oil engines.

7.1.4.7 Disposal of Waste

Total waste to be generated during the five years of Mining Plan period will be 31,204 m^3. The waste material will be dumped on the western side of SF. No. 486(Part) of the lease applied boundary. The dumps will be maintained not exceeding 5m height and the angle of slope of dumps will be at 45° from horizontal.

7.1.4.8 Topsoil Management

Topsoil will be properly stacked at earmarked dump site with adequate measures. It will be used for growing plants along the fringes of the site roads and reclamation of external dump and backfilled area. The topsoil stockpiles will be low height and will be grassed to retain fertility. Besides these topsoil stacks there will be temporary stacks near the excavation area and area to be reclaimed which will be made use of for concurrent lying without bringing the topsoil to the soil stack near the OB dump.

7.1.4.9 Disposal of Mining Machinery

Mining operations are planned to be operated using Company owned machinery. The company has its own Excavators, Mining Tippers, compressors; wire saw machine, jack hammers, and other mining equipment. These machines are compliant with the RTO conditions and CPCB conditions. Further, the company also operates a central workshop at Salem, to cater to major repairs/Rectifications of company Equipment.

These machineries are written off and disposed on completion of their normal life as per the set guidelines of the Government and TAMIN Board. The surplus machinery in working order, will be transferred to Company's other projects.

7.1.4.10 Other Infrastructure

Mine office, storeroom, first-aid room etc, will be provided on semi-permanent structures within the lease area.

7.1.4.11 Safety & Security

In this area quarrying is proposed at elevated area therefore, the safety of pits will not hurt. The cattle and humans, however, the area will be protected by barbed wire fencing to avoid undo incidences in quarry area.

8 PROJECT BENEFITS

- The quarrying activities in this belt will benefit the local people both directly 30 persons & indirect persons are 20 Nos.
- The direct beneficiaries will be those who get employed in the mines as skilled and unskilled workers.
- Improvement in Per Capita Income.
- The Socio - Economic conditions of the village and distance will enhance due to the project, hence the project should be allowed after considering all the parameters.
- It can thus be concluded that the project is environmentally compatible, financially viable and would be in the interest of the construction industry thereby indirectly benefiting the masses.
- CER and CSR benefit the nearby villages.
- Implementation of time bound corporate social responsibility will lead to installation of drinking water plants in the nearby villages will improve the physical Infrastructure.
- A provision for implementation of fish culture activity (optional) will lead to improve the skills of local needy people.
- There will be a change in Land Use of the area due to the proposed mining activity. but project activity will lead to local socioeconomic benefit which will attract change in land use by developing small shops in the area, maybe chance of developing better household infrastructures etc.

9 ENVIRONMENTAL COST & BENEFIT ANALYSIS

Not recommended during scoping stage.

10 ENVIRONMENTAL MANAGEMENT PLAN

10.1 Introduction

This Environmental Management Plan (EMP) for the proposed Colour Granite Quarry, identifies the principles, procedures and methods that will be used to control and minimize the environmental impacts of the proposed operational activities associated with the proposed project development. It is intended to ensure that commitments made by the proposed minimize project related environmental and social impacts. As part of our ongoing commitment to excellence in environmental and social performance we will ensure the following:

- Fulfill all environmental conditions associated with project approvals.
- Develop, promote, and foster a shared sense of responsibility for the environment and performance of the project.
- Promote environmental awareness and understanding among employees and contractors through training, identification of roles and responsibilities towards environmental management.
- Linking project performance to overall environmental performance.

To monitor the environmental performance throughout the project and implement an adaptive management approach for continuous improvement and to meet the regulations.

10.2 Objective of Environmental Management Plan

The EMP has the following goals:

- Identifying project activities that may have a detrimental impact on the environment.
- Detailing the mitigation measures that will need to be taken, and the procedures for their implementation.
- Establishing the reporting system.
- An integrated plan for monitoring, assessing, and controlling potential impacts once the project has been approved and all permits and conditions granted.
- Facilitate a continual review of post operation activities.
- Preparation of Greenbelt Development.
- Preparation of rainwater harvesting scheme and energy conservation actions
- To prepare a detailed action plan for implementation of mitigation measures.
- Measure the effectiveness and success of proposed mitigation measures.
- Development of Environment Management Cell

- The EMP also serves to highlight specific requirements that will be monitored during the development, and should the environmental impacts not have been satisfactory prevented or mitigated; corrective action will have to be taken. The document should, therefore, be seen as a guideline that will assist in minimizing the potential environmental impact of activities.

10.3 Air Quality Management

The Project Proponent is proposed Open Cast Semi mechanized to carry out the mining operations, and there is involvement of labors too. Dust would be generated during site preparation drilling, Blasting, mining, hauling, handling, and transportation of the material. Dust is likely to be generated from emissions of diesel vehicles such as SO_2 NO_x etc. The objective of the EMP will be to reduce air emission due to the proposed project due to Increase in air pollution by the proposed project activities. With proper Implementation of the proposed EMP, can be reduce impact on Ambient Air Quality in and around the site.

Emission Source Identification

- The Emission sources are activities related to pits and quarries including, overburden operations, drilling, hauling, loading, and unloading stockpiles. The emission sources may be subdivided into six broad categories:
- Emissions of PM and road dust due to HEMM & Mining Tippers.
- Emissions from generators/vehicles/machinery.

10.3.1 Measures for dust suppression

Water will be sprinkled for suppression of air borne dust on mine haulage roads and waste dumps on regular intervals by water tankers. Drilling blast holes of 32 mm dia will be always under wet condition to prevent flying of dust. In the unloading point of Tippers, water will be sprinkled and further the drillers are provided with respirators in accordance with mines regulations.

- PUC certified vehicles will be used for transportation.
- The working faces will be regularly wetted before carrying out the drilling and excavation.
- Dust masks will be provided to the workers especially for the drillers and for the workers working in the loading operations.
- Periodic health checkups for the workers shall be done.
- Plantation along approach roads and surrounding the Quarry Lease area.

- Water tankers with spraying arrangements will be used for regular water sprinkling on the haul roads to ensure effective dust suppression.

Haulage

- Haul road will be maintained regularly.
- Speed limits will be prescribed for transport vehicles.
- Water will be sprayed daily on the roads by using water tankers.
- Periodic maintenance of the trucks used for transport shall be done to reduce smoke emissions.
- Overloading of trucks is avoided.

10.3.2 Emissions from Material Handling

PM emissions occur during the handling and transfer operations of material from one process to another within the facility. Open storage piles of raw material and products are generated at various points throughout the operational area. The environmental control measures, which are being taken and proposed to control the fugitive dust released during the stone quarry production are given below:

- The working faces will be regularly wetted before carrying out the drilling and excavation.
- Dust masks will be provided to the workers especially for the drillers and for the workers working in the loading operations.
- Periodic health checkups for the workers shall be done.
- Plantation along approach roads and surrounding the Quarry Lease area.
- Water tankers with spraying arrangements will be used for regular water sprinkling on the haul roads to ensure effective dust suppression.

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- Periodic maintenance of the trucks used for transport shall be done to reduce smoke emissions.
- Overloading of trucks is avoided.

10.4 Noise Pollution Control

In an operational mine major noise sources are the operation of mine machineries, equipment & plying vehicles. Noise generation may be for an instant, intermittent or continuous period, with low to high decibels. General noise levels generated at mines are documented below.

Equipment	NoiseLevel (dB(A))
RotaryDrills	72-100
Compressor(85M^3/min)	50-55
Excavator	75-90
DieselTipper	74-109
DieselGenerator	80-94

The management plan for controlling noise pollution is as given below:

- Reducing the drilling operations as far as possible.
- Provision of earmuffs to workers working in high noise prone areas.
- Proper gradient of haul roads to reduce cumulative noise levels.
- Development of green belts all along the boundary of the mining lease area will act as an effective noise barrier.
- Use Diamond Wire Saw machine and crack powder to reduce noise.
- Restriction of blast hole drilling to only daytime hours and usage of sharp drilling bits and delivery of compressed air at optimal pressure during drilling.
- Noise emanating machines such as compressors and diesel generators are enclosed in acoustic enclosure to reduce the noise level.

10.5 Water Pollution Control Measures

- There are no major streams and rivers, which can get effected by the mining. Hence there will be no major effect on the surface water environment. Surface water ditches or channels will be made to divert all surface drainage for agricultural purposes.
- Mine water will be used in mechanized cutting of the blocks and for wetting purposes.
- The runoff from the dumps will be channelized and care will be taken.
- Mine water will be used in wet drilling process, dust suppression & green belt development.
- The runoff from the dumps will be channelized and care will be taken.
- Domestic Wastewater will be disposed through Septic tank followed by soak pit. The septic tank will be cleaned periodically.

10.6 Land Environment

The landscape will be slightly changed due to open cast quarry. There will be no land subsidence as the area is made up of hard rock. The aesthetic environment will not be affected, as the quarry is in hilly terrain. Soil cover and the weathered material accounts for the Over Burden. Agriculture is seen mainly in the plains far away from the lease area. A few bushes will be cleared to facilitate mining and other related activities and there are no big trees.

- Topsoil shall be used in afforestation work.
- A retaining wall and garland drain will be constructed all around to prevent the washing off.
- Landscape will be changed due to open cast quarry. There will be no land subsidence as the area is made up of hard rock. The aesthetic environment will be affected.
- Soil cover and the weathered material accounts for the Over Burden
- Topsoil will be removed & stored on the inner boundary of the mining lease area. To improve its quality, soil stabilizers shall be mixed, and leguminous plantation will be done over these stacks.

10.7 Biological Environment

The Quarry lease applied area does not cover any forest area. Occasionally, few shrubs are grown within the quarry lease applied area, the quarry lease applied area exhibits rocky nature. Some of the fauna presents are mostly domestic animals like cows, buffalos, sheep, Goat, Dogs and Cats. No endangered species are reported from this area. The existing area is not a habitat for migrating fauna, nor does it form a breeding ground. However, Loss of vegetation and habitats will occur due to project activities.

Proposed Mitigation Measure to implement under EMP:

- This area hosts common animals. Indian Dogs, Jungle and Domestic cat, Rhesus macaque, Domestic Cows, Buffaloes, Bullocks, and Goat etc. are found amongst mammals. There are some Schedule species like Columba livia (Blue rock pigeon) – Sch – IV, Pavo cristatus (Indian peafowl) - Sch I (Part III), Sus scrofa (Wild boar)- Sch III, Mellivora capensis (Honey badger)- Sch I (Part I), Muntiacus muntjak (Southern red muntjac)- Sch III, Felis chaus (Reed cat) - Sch II (Part I), Viverricula indica (Small Indian civet) - Sch II (Part I), Paradoxurus hermaphroditus (Asian palm civet) - Sch II (Part I), Ratufa macroura (Grizzled giant squirrel) - Sch I (Part I) & Naja naja (Nalla Pambu) - Sch II (Part II) and some vulnerable species like Panthera pardus fusca (Indian leopard)- Sch I (Part I), Melursus ursinus (Indian bear) - Sch I (Part I), Bos gaurus (Indian bison) - Sch I (Part I), Albino gaur (White bison)- Sch I (Part I), Semnopithecus johnii (Nilgiri langur) - Sch I (Part I), Semnopithecus entellus (Gray langurs) - Sch I (Part I), Macaca radiata (Bonnet macaque) - Sch I (Part I), Tetracerus quadricornis (Four-horned antelope) - Sch I (Part I), Rusa unicolor (Sambar) - Sch I (Part I) and Chevrotains (Mouse-deer) - Sch I (Part I). There are few endangered species like Elephas maximus (Asian elephant) - Sch I (Part I), Macaca Silenus (Lion-tailed macaque) - Sch I (Part I), Cuon alpinus (Dhole) - Sch I (Part I), Scandentia (Tree Shrew) - Sch I (Part I) identified in the buffer zone of the study area. There are no rare species identified in the study area.

- There are no National Parks, Sanctuary, Biosphere Reserve, Tiger Reserve, Elephant Reserve, wildlife migratory routes in core and buffer zones within the 1km radius of the project.
- No wildlife is found in the quarry Lease area. To minimize the impacts and to improve up on the existing eco system Afforestation plan will be envisaged with native plants.
- Lighting will be avoided during nighttime in the quarry. However, the operations will be carried out only in daytime.

10.8 Afforestation Plan

The main aim of the plantation of the mined-out areas is to stabilize the area to protect it from rain, wind erosion, improve the aesthetics and support the re-creation of biodiversity.

- Afforestation will be taken up along the lease area.
- In the Scheme of Mining 20 plants per year are proposed to be planted for complying Afforestation program with the arrived survival rate of 50%.
- Only Shrubs and bushes are seen in the quarry Lease area.

10.8.1 Socio Economic Environment

The social management plan proposes to improve the quality of life of inhabitants of potentially affected villages directly. The goal is “a pollution free area with improved quality of life and empowered community “and the three key pillars on which this would be developed are social, health, infrastructure improvements with efforts on minimal disruptions of present lifestyle and any ensuing negative impacts.

10.9 Occupational Health & Safety Measures

Granite stone does not contain any toxic elements. Further this being a semi-mechanized mine, production is by semi-mechanized means and waste material handling partly by mechanized way, there shall be marginal impact on air and noise qualities. Therefore, the possibilities of any health hazards are minimal.

- Awareness and planning are keys to prevention of occupational health hazards.
- Conducting air monitoring to measure worker exposures and to ensure that provided controls are adequate for protection of workers.
- Adequate respiratory protection will be provided to the workers.
- Periodic medical examinations for all workers.
- Provide workers with training that includes information about health effects, work practices, and use of protective Equipment’s.

10.10 Socio-Economic Benefits

Granite Quarry project is not going to have any negative impact on the social or cultural life of the villagers in the near vicinity. The quarry activity will provide job opportunities, which will help them to develop economically. Granite quarry will be done with the vision of leaving a positive impact on socioeconomics of people living in the nearby villages. A first-aid centre to meet the basic medical needs of employees will be provided.

10.10.1 Employment potential

Around 30 people directly and 20 people indirectly employed including material suppliers, outside workshops, unit supported industries. Local villagers residing in the nearby villages shall be employed as semi-skilled workers.

10.10.2 Care and Maintenance during Temporary Discontinuance

All the provisions as per the Mines Act 1952 and Rule17 of GC & DR 1999 shall be strictly adhered to during temporary discontinuation.

10.10.3 Safety and Security

At the end of quarry operations, the total area excavated will be fenced properly with a single opening for workers engaged in closure plan work.

10.10.4 Corporate Social Responsibility

TAMIN will spend 2.5% of project profit under Corporate Social Responsibility (CSR) to the neighborhood villages.

10.10.5 Corporate Environmental Responsibility

As per the provisions of MOEFCC office memorandum F-22-65/2017IA.III dated 1.05.2018, The project proponent has earmarked an investment of Rs. 1,99,940 /- towards CER (being 2% of the total capital cost) and this budget will be allocated as per the committee recommendation during the Public Hearing.

10.10.6 Budget for Environmental Protection

It is necessary to include the environmental cost as a part of the budgetary cost component. Total of Rs.2,05,000/- allocated for environmental protection activities. Environmental Management cost is given in Table 10-1.

Table 10-1EnvironmentalManagementPlanCost

S. No	Details	Amount (Rs.)
1	Afforestation	30,000/-
2	Water Sprinkling	50,000/-
3	Water Quality Test	25,000/-
4	Air Quality Test	25,000/-
5	Noise / Vibration Test	25,000/-
6	CSR Activities	50,000/-
Total		**2,05,000**

10.11Environment Policy of TAMIN

M/s. Tamil Nadu Minerals Ltd believes that good safety, Health & Pollution control practices contribute to individual well-being and organization morale. Our commitment to Safety, Health and Environment stretches beyond statutory obligations and we are committed to managing and continually improving overall safety, Health, and Environmental performance. We M/s Tamil Nadu Minerals Ltd are committed to ensure that:

- We develop safe working methods and practices, with the objective of having no injuries and accidents in the workplace and providing a safe workplace for our employees, contractors and others who perform their duties. We shall provide adequate Health care to our employees and create processes to reduce the adverse effect of the operations on the health of the employees.
- We provide safety appliances and continuous training in safety to our employeesand contract workmen to ensure safe production and achieve the target of zero accidents. We are committed to supporting actions aimed at increasing employees' safety outside work hours.
- We continuously evaluate and improve our conduct and carry out regular audits, analysis, and studies to eliminate potential concerns and continuously improve upon our Safety, Health, and Environmental standards.
- We communicate our Safety, Health, and Environmental Policy to all our employees' contractors and to the public for better understanding and practice.
- Management has knowledge of relevant issues regarding Safety, Health and Environment and provides a foundation for setting objectives and targets. Management shall fulfill its responsibility to inform, educate and motivate employees and others to understand and comply with this policy and applicable laws.

The TAMIN has formulated well-planned and integrated Environmental policies as shown below:

- M/s Tamil Nadu Minerals Ltd is committed to welfare and development needs of the

society around it.

- All rules and conditions prescribed in the Indian Mines Act, Metalli ferrous Mines Regulation etc., will be adopted to ensure risks-free and safe mining operations. All personal protective devices supplied to workers and staff should be used while they work in the mines and any violation in this respect will be dealt with inflict of warnings first, followed subsequently by punitive punishments including fines and ultimately dismissal, if repeated continuously.
- Any infringement / violation of any rule or unsafe mining operations should be reported to Mines Manager / Mine Foremen /Mine Mate/ Blaster who will take immediate corrective measures for avoiding major disasters. The report will ultimately reach the Board of Directors through upwardly hierarchical communicative channels from the lowest level to superior levels in quick time bound duration.
- The Agent and the Mines Manager should exercise overall control over entire mining and connected operations and all infringements / violations on any count pertaining to unsafe operations, environmental degradation, etc., should be brought to the notice of the Board of Directors. Remedial measures for such violations and deviations should be taken by the Mines Manager to avoid any hazards or disasters in the mine and nearby areas. The persons responsible for such violations will be punished through appropriate disciplinary penal actions.
- The EC conditions and stipulations will be strictly followed by all supervisory staff of the mine, and will co-ordinate in various issues like prescribed environmental monitoring schedules, vibration monitoring studies during blasting, green belt development, management of dumps etc.
- Penal actions will be taken by the company in cases of continuous negligence resulting in violations deviations in this respect.
- A time schedule of once in 15 days for review of all operational factors as mentioned above is in force, for proper and quick corrective actions. Hierarchical System of the TAMIN is shown in Figure 10-1.

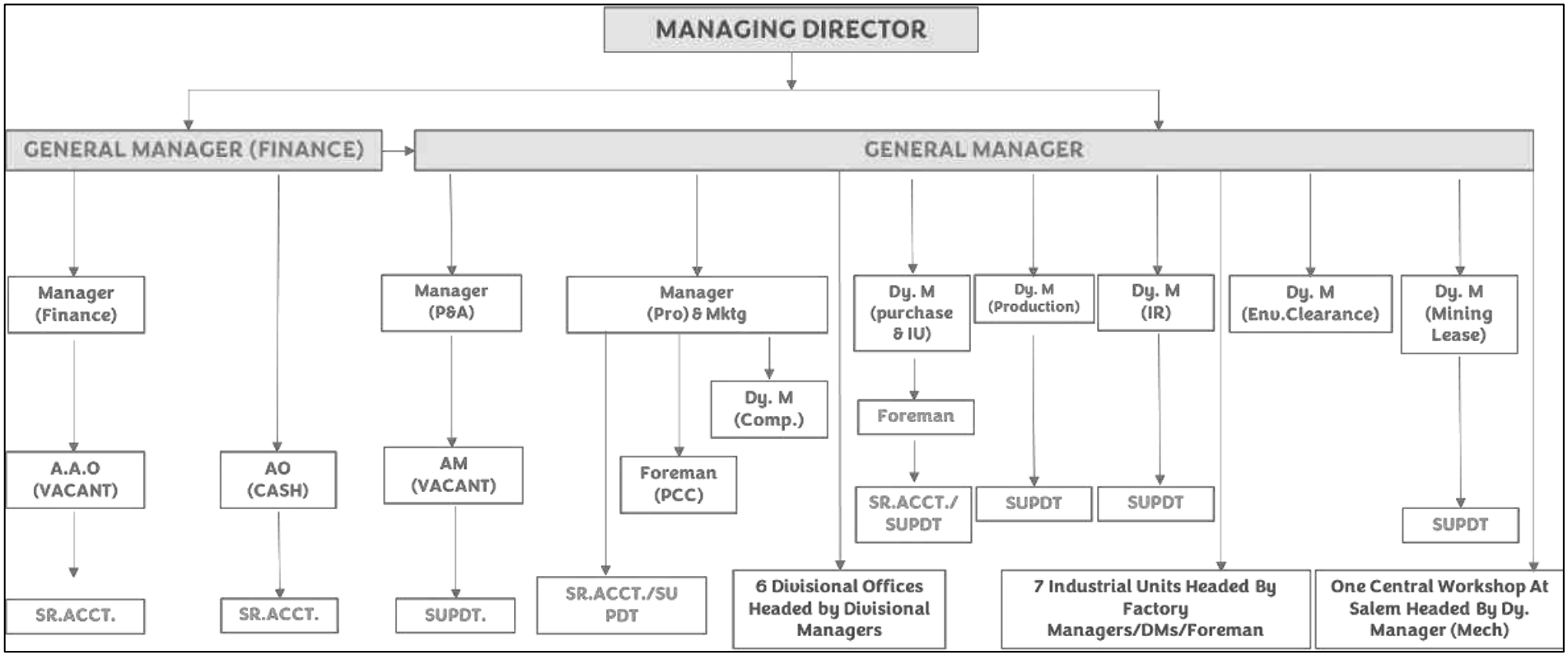

Figure 10-1 Hierarchical System of the TAMIN

11 SUMMARY & CONCLUSION

11.1 Background

M/s. Tamil Nadu Minerals Ltd, (An undertaking of Government of Tamil Nadu) was established in the year 1978, to carry out systematic mining and development of different minerals all over the state. Ever since its inception TAMIN has developed expertise in the mining of granite dimensional stones of different varieties including Black Granite(Dolerite), Kashmir White(Leptynite), Paradiso(Migmatite Gneiss), Green Onyx(Syenite-porphyry), Red wave (Pink Feldspathic Gneiss) Colombo Juparana(Pegmatitic Granite Gneiss of magmatic origin), Raw silk(Yellow Feldspathic Leptynite) and a number of other coloured granite varieties apart from other industrial minerals viz., Quartz and Feldspar, Graphite, Limestone, Vermiculite etc,.

The Color granite quarry has been set up over a total extent area of 27.04.5 Ha located at S. F. No.486 (Part) & 736/4, Jakkery Village, Denkanikottai Taluk, KrishnagiriDistrict, Tamil Nadu State. Quarry Land is classified as Government Poramboke land andlease obtained by Tamil Nadu Minerals Limited (TAMIN).

The lease was granted over an extent of 27.04.5 Ha. vide G.O. Ms. No. 238 Industries (MMEI)Department, dated: 17.03.1999. The period of lease is for 20 years. The lease is valid from21.06.1999 up to 20.06.2019.

The Mining plan was approved by the Commissioner of Geology & mining, Chennai vide letterNo. 4997/MM9/2003, dated 09.02.2005. Modified scheme of mining–I pertaining to the years2010-2011 to 2014-2015 due to increase of production vides this office Lr. No.15657/ML2/2009, dated 30.09.2009. Taking into consideration deemed approval of bothmining plan under Rule 17 (6) of GDCR 1999 and the modified scheme of mining- I, underRule 18 (5) of GCDR 1999, the present scheme of mining –II pertaining to the years 2015-2016 to 2019-2020 has been prepared and submitted to the Department of Geology andMining for approval, vide this office letter RC. No 10319/ML2/2014 dated 10.09.2014.

M/s Tamil Nadu Mineral Limited applied for seeking Environmental Clearance at Tamil Nadu-SEIAA vide letter no.Rc.No.3446/ML3/2015 dated 08.09.2015. ToR obtained from SEIAA-TNvide Letter No. SEIAA-TN/F.No. 3891/SEAC-LXVIII/TOR-232/2015 dated 06.11.2015. As per obtained ToR, Public Hearing is conducted on 02.12.2016.

The project falls under B1 violation category due to operational without Environmental Clearanceas per MoEF & CC Gazette Notification No. S.O.804 (E) dated 14th March 2017. The ECApplication submissions under violation at MoEF & CC vide Proposal NoIA/TN/MIN/68345/2017 dated: 11.09.2017.

As per MoEF & CC Gazette Notification No.S.O.804 (E) dated 14th March, 2017 and itssubsequent amended gazette notification no. S.O. 1030 (E) dated 8th March, 2018 and OM F.No. Z-11013/22/2017-IA.II (M) dated 15th & 16th March, 2018, MoEF&CC transferred the proposal to SEIAA-TN vide New Proposal No. SIA/TN/MIN/27166/2018 dated: 02.06.2018.The EC application is submitted under violation at TN SEIAA vide ProposalNo.SIA/TN/MIN/23921/2018 dated 09.04.2018.ToR was issued Lr No. SEIAA-TN/F-3891/TOR-408/2018 dated 22.05.2018 for the preparation of EIA/EMP report. Based on the previous Baseline study and PH on 02.12.2016 final EIA/EMP report is submitted in SEIAA-TN. PoD is submitted vide TAMIN Letter Rc. No.3446/ML3/2015 dated: 27.02.2019.

The lease of the quarry expired on 20.06.2019. During the EC Violation period (15.01.2016 to 10.01.2017), TAMIN had transported 1634.603 m^3. Hence, TAMIN remitted the 100% sale value of the mineral to the tune of Rs.2.01Cr. (Rs.2,01,74,270/-). Accordingly, the Director of Geology and Mining has issued NoC to get EC vide Letter Rc. No. 553/MM4/2020, dt. 27.07.2020. TAMIN obtained the quarry lease renewal vide Letter Rc. No.643/ML2/2018 dated: 21.04.2018. HACA recommendedduring 80th Meeting held on 26.06.2023 vide Town and Country Planning Department Letter Roc. No. 11938/2023/HACA dated: 26.07.2023.

The Government of Tamil Nadu has issued the precise area communication letter to furnish the approved Mining plan under Go. TN, Natural Resources (MME.1) Department for quarrying Colour Granite over an extent of 27.04.5 Ha of Government poramboke land in SSF No. 486(Part) & 736/4, Jakkery Village, Denkanikottai Taluk, Krishnagiri District for a period of 20 years vide Govt.Letter No. 5883890/MME.2/2023-1, dated: 14.02.2024. The Precise Area Communication Letter is enclosed as **Annexure-3.**

Accordingly, TAMIN submitted the Mining Plan for the subject area and the same was approved by the Commissionerate of Geology and MiningUp to lease period as pr Rule 18(1) GCDR,1999Chennai vide Letter Rc. No. 8664/MM4/2019, dated: 22.05.2024. The mining plan approval letter is enclosed as **Annexure-4**. The mining plan is enclosed as **Annexure-6**. TAMIN has applied for ToR vide Online proposal No.SIA/TN/MIN/488460/2024 dated: 18.07.2024. Accordingly, TAMIN remitted the amount of Rs. 3.5 Lakh Processing fee as per New G.O vide SEIAA-TNF.No.10771/2024, dt. 21.03.2024.

The proposal was appraised under violation during 492 th SEAC Meetingheld on 29.08.2024 vide SEIAA No. 11115, Unit: VI, Online Proposal No. SIA/TN/MIN/488460/2024.ToR was issued under violation with Public Hearing vide identification No. TO24B0108TN5942228N dated: 21.09.2024 for the preparation of EIA/EMP report.

11.2 Project Description

11.2.1 Project Salient Features

<table>
<tr><th>S. No</th><th>Particulars</th><th colspan="4">Details</th></tr>
<tr><td>1</td><td>Latitude & Longitude</td><td colspan="4">12°33’54.13” N & 12°33’39.44” N
77°52’14.17” E & 77°52’14.17” E</td></tr>
<tr><td>2</td><td>Site Elevation above MSL (m)</td><td colspan="4">794 - 817 AMSL</td></tr>
<tr><td>3</td><td>Topography</td><td colspan="4">Hilly terrain</td></tr>
<tr><td>4</td><td>Lease area Topo Sheet details</td><td colspan="4">57-H/14, H/15</td></tr>
<tr><td>5</td><td>Land classification</td><td colspan="4">Government Poramboke land</td></tr>
<tr><td>6</td><td>Nearest highway</td><td colspan="4">SH-85: Attibelle - Royakottai Road~ 2.19km (NNE)
NH 44: Srinagar (Jammu & Kashmir) - Kanyakumari (Tamilnadu) ~ 14.45Km (NNE)</td></tr>
<tr><td>7</td><td>Nearest Railway station</td><td colspan="4">PeriyaNagathunai Railway Station ~ 4.08Km (E)</td></tr>
<tr><td>8</td><td>Nearest Airport</td><td colspan="4">Hosur Airport - 14.31Km, NW</td></tr>
<tr><td>9</td><td>Nearest Town / City</td><td colspan="4">Hosur - 17.18 Km, NNW</td></tr>
<tr><td rowspan="21">10</td><td rowspan="21">Areas which are important or sensitive for ecological reasons – Wetlands, Watercourses or other water bodies, coastal zone, biospheres, mountains, forests</td><td>S. No</td><td>Description</td><td>Distance (km)</td><td>Direction</td></tr>
<tr><td>1</td><td>Lake near Puvanapalli</td><td>2.61</td><td>WSW</td></tr>
<tr><td>2</td><td>Lake near DoddeGaunapalli</td><td>3.58</td><td>NNW</td></tr>
<tr><td>3</td><td>Lake near Bitireddi</td><td>4.04</td><td>W</td></tr>
<tr><td>4</td><td>Kelamangalam Lake</td><td>4.09</td><td>NNW</td></tr>
<tr><td>5</td><td>Lake near Gopasandram</td><td>4.09</td><td>NNW</td></tr>
<tr><td>6</td><td>Lake near Narappanatti</td><td>5.17</td><td>S</td></tr>
<tr><td>7</td><td>Lake near Kelamangalam RS</td><td>5.33</td><td>N</td></tr>
<tr><td>8</td><td>Lake near Varaganapalli</td><td>5.46</td><td>E</td></tr>
<tr><td>9</td><td>Lake near D. Kottappalli</td><td>6.47</td><td>N</td></tr>
<tr><td>10</td><td>Lake near Tuppuganappalli</td><td>6.71</td><td>NE</td></tr>
<tr><td>11</td><td>Lake near Timmasandiram</td><td>6.99</td><td>SW</td></tr>
<tr><td>12</td><td>Nagamangalam Lake</td><td>7.41</td><td>E</td></tr>
<tr><td>13</td><td>Lake near Kommepalli</td><td>8.2</td><td>NNE</td></tr>
<tr><td>14</td><td>Lake near Uddanapalli</td><td>8.43</td><td>ENE</td></tr>
<tr><td>15</td><td>Lake near Denkanikottai</td><td>8.77</td><td>WSW</td></tr>
<tr><td>16</td><td>Panchapalli Dam</td><td>9.24</td><td>SSE</td></tr>
<tr><td>17</td><td>Lake near Jonbanda</td><td>12.27</td><td>N</td></tr>
<tr><td>18</td><td>Lake near Pillyakottur</td><td>13.97</td><td>NE</td></tr>
<tr><td>19</td><td>Lake near Kamandoddi</td><td>14.1</td><td>NNE</td></tr>
<tr><td>20</td><td>Lake near Eripanchapalli</td><td>14.34</td><td>SE</td></tr>
</table>

<table>
<tr><td rowspan="8">11</td><td rowspan="8">Reserve Forests</td><td>S. No</td><td>Description</td><td>Distance (km)</td><td>Direction</td></tr>
<tr><td>1</td><td>Udedurgam RF</td><td>2.99</td><td>SSE</td></tr>
<tr><td>2</td><td>Marandahalli Extension RF</td><td>8.65</td><td>SSE</td></tr>
<tr><td>3</td><td>Aiyur RF</td><td>10.48</td><td>SSE</td></tr>
<tr><td>4</td><td>Aiyur Extension RF</td><td>9.73</td><td>SSE</td></tr>
<tr><td>5</td><td>Denkanikotta RF</td><td>3.21</td><td>S</td></tr>
<tr><td>6</td><td>Nohanur RF</td><td>10.93</td><td>SW</td></tr>
<tr><td>7</td><td>Sanamavu RF</td><td>5.37</td><td>N</td></tr>
<tr><td>8</td><td>RF</td><td>7.86</td><td>N</td></tr>
<tr><td>12</td><td>Seismic Zone</td><td colspan="4">Zone-II (Low risk)</td></tr>
<tr><td>13</td><td>Defense Installations</td><td colspan="4">Nil within 15 km radius</td></tr>
<tr><td>14</td><td>Interstate Boundary</td><td colspan="4">Nil within 15 km radius</td></tr>
<tr><td>15</td><td>HACA Regions</td><td colspan="4">HACA Clearance Letter is enclosed as Annexure 11.</td></tr>
</table>

11.2.2 Project Summary

S. No	Particulars	Details
1.	Project Location	S. F. No. 486 (Part) & 736/4, Jakkery Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu State.
2.	Land classification	Government Poramboke land
3.	Extent of lease area (Ha.)	27.04.5
4.	Quarry Lease	Govt. Letter. No.5883890/MME.2/2023-1, dated: 14.02.2024
5.	Lease Period	20 years
6.	Estimated Geological Reserves (ROM) M^3	37,00,465
7.	Estimated Mineable Reserves (ROM) M^3	29,53,169
8.	Colour Granite production per annum M^3	RoM 2500 with 25% recovery
9.	Depth of Mining	30m above ground level (from Top of the hill)
10.	Method of Mining	Open cast semi mechanized method
11.	Water Requirement (KLD)	3.5
12.	Source of Water	Authorized vendors and local panchayat
13.	Power requirement (kVA)	60
14.	Power Backup (DG set) kVA	1* 125
15.	Fuel requirements (Lts/Day)	200
16.	Manpower (Nos)	30
17.	Municipal Solid Waste Generation (kg/day)	13.5
18.	Waste Oil generation (Lts/Year)	3.0
19.	Project Cost in Lakhs	99.97

11.3 Description of Environment

Summary of Baseline Studies:

Project Influence Area (PIA)/Study Area: An area covering 10 km radius from Jakkery Colour granite quarry boundary has been earmarked as study area for baseline studies.

Study Period: The baseline environmental surveys were carried out during (**March 2024 – May 2024**) within the study area.

Summary of Baseline Studies:

- The site has a hilly terrain with level 794-817 m above MSL.
- The project site falls under Zone-II (Low risk) as per IS 1893(Part-I).
- The predominant wind direction is South during study period.
- Max Temperature:40^{0}C, MinTemperature: 21 ^{0}C & Avg Temperature:33.5^{0}C
- Average Relative Humidity:43.25 %
- Average Wind Speed:5.26 m/s.

11.3.1 Ambient Air Quality

Maximum concentrations of PM10, PM2.5, SO2, NO2, CO, Pb, O3, NH3, C6H6, C20 H12, As &Ni, are well within the National Ambient Air Quality Standards for Industrial, Commercial and Residential areas at all monitoring locations during the study period. The average baseline levels of PM10 (37.2 – 67.6µg/m³) PM2.5 (20.5 – 37.2µg/m³) SO2(5.1 – 12.6 µg/m³), NO2(14.6–30.9 µg/m³), all the parameters are well within the National Ambient Air Quality Standards for Industrial, Commercial and Residential areas at all monitoring locations during the study period.

11.3.2 Noise Environment

Ambient noise levels were monitored using precision noise level meter in and around the project site at 10 km radius at 8 locations during study period. In Industrial areas daytime noise levels were about 51.5 dB(A) and 42.8 dB(A) during nighttime, which is within prescribed limit by CPCB (75 dB(A) Day time & 70 dB(A) Nighttime).

In residential areas daytime noise levels varied from 48.5 dB(A) to 54.0 dB(A) and nighttime noise levels varied from 36.9 dB(A) to 44.2 dB(A) across the sampling stations. The field observations during the study period indicate that the ambient noise levels are well within the prescribed limit by CPCB (55 dB(A) Day time & 45 dB(A) Nighttime).

11.3.3 Water Environment

The prevailing status of water quality at 08 locations for surface water and 8 locations for ground water have been assessed during the study period. The standard methods prescribed in IS were followed for sample collection, preservation, and analysis in the laboratory for various physiochemical parameters.

Surface water quality

- pH ranges from 7.12- 7.85.
- Total Dissolved Solids range from 403 mg/l to 710 mg/l.
- Chloriderangesfrom113 mg/lto220mg/l.
- The sulphate content in the surface water of the study area varies between 28.2 mg/l –55.0 mg/l.
- Total hardness ranges between 108.8 mg/l–240.7 mg/l.
- The BOD value ranges from 1.1mg/l to 4.5 mg/l.
- COD value 24.6 mg/l to 40.5mg/l.
- The concentration of heavy metals like As, Cd, Cr, Pb, Mn, Hg, Ni and Seat all locations are within the limits of IS 2296:1992 (Class C: Drinking water with conventional treatment followed by disinfection).

Ground Water Quality

- The average pH ranges from 7.18 to 7.68.
- TDS value varied from varied from 439 mg/l to 728 mg/l
- The chloride concentration ranged from 123mg/l to 208 mg/l
- The sulphate content of the ground water of the study area is varied between 30.7 mg/l– 52.1 mg/l meeting the acceptable limit of the IS 10500: 2012.
- It is observed that all the collected ground water samples meet the drinking water standards (IS 10500:2012) Permissible Limit and can be used for drinking.

11.3.4 Land Environment

Assessment of soil characteristics is of paramount importance since vegetation growth, agricultural practices and production are directly related to soil fertility and quality. Soil sampling was carried out at eight (08) locations in the study area. It is observed that,

- The pH of the soil samples ranged from 6.99 to 7.77.
- Conductivity of the soil samples ranged from 138 µmhos/cm to 385µmhos/cm.
- Nitrogen content ranged from71 kg/ha to 141 kg/ha.
- Phosphorous ranged from 15 kg/ha to 25 kg/ha.
- Potassium content ranges from 58 kg/ha to 91 kg/ha.

11.3.5 Biological Environment

Baseline Biological survey was carried out to assess the ecology of the study area. The floral diversity is grouped into trees, shrubs, climbers, and herbs. Similarly, the faunal diversity is grouped into mammals, birds, reptiles, and amphibians. There are no extinct flora and fauna species found in the study area.

Flora

It was observed that the flora, which includes herbs, shrubs, and trees, were sparsely distributed within the study area as per IUCN status Least concern, vulnerable species are observed within the study area. The detailed List of flora reported/observed in the study area is given in **Chapter 3, Section 3.11.1**.

Fauna

This area hosts common animals. Indian Dogs, Jungle and Domestic cat, Rhesus macaque, Domestic Cows, Buffaloes, Bullocks, and Goat etc. are found amongst mammals. There are some Schedule species like Columba livia (Blue rock pigeon) – Sch – IV, Pavo cristatus (Indian peafowl) - Sch I (Part III), Sus scrofa (Wild boar)- Sch III, Mellivora capensis (Honey badger)- Sch I (Part I), Muntiacus muntjak (Southern red muntjac)- Sch III, Felis chaus (Reed cat) - Sch II (Part I), Viverricula indica (Small Indian civet) - Sch II (Part I), Paradoxurus hermaphroditus (Asian palm civet) - Sch II (Part I), Ratufa macroura (Grizzled giant squirrel) - Sch I (Part I) & Naja naja (Nalla Pambu) - Sch II (Part II) and some vulnerable species like Panthera pardus fusca (Indian leopard)- Sch I (Part I), Melursus ursinus (Indian bear) - Sch I (Part I), Bos gaurus (Indian bison) - Sch I (Part I), Albino gaur (White bison)- Sch I (Part I), Semnopithecus johnii (Nilgiri langur) - Sch I (Part I), Semnopithecus entellus (Gray langurs) - Sch I (Part I), Macaca radiata (Bonnet macaque) - Sch I (Part I), Tetracerus quadricornis (Four-horned antelope) - Sch I (Part I), Rusa unicolor (Sambar) - Sch I (Part I) and Chevrotains (Mouse-deer) - Sch I (Part I). There are few endangered species like Elephas maximus (Asian elephant) - Sch I (Part I), Macaca Silenus (Lion-tailed macaque) - Sch I (Part I), Cuon alpinus (Dhole) - Sch I (Part I), Scandentia (Tree Shrew) - Sch I (Part I) identified in the buffer zone of the study area. There are no rare species identified in the study area.

11.3.6 Socio Economic Environment

The project is located at Sathanur Village, Thandarampattu Taluk, Tiruvannamalai District, Tamil Nadu State. There are 23 villages around the study area (10Km) radius, the population around the area accounts to 123840. The literacy rate is less (58.6 %, Literates are 72514). compared to the district literacy rate (72.41%) which can be improved by this project through CSR activities. The area has a good number of health facilities well connected by roads to avail themselves of the emergency services. The rapid

industrialization in the locality creates job opportunities for many people and increases the economic vibrancy in the area.

Total Working Population is 59388 Nos, Main Workers is 49677 Nos and Marginal Workers is 9711 Nos. The detailed information provided in **Chapter 3, Section 3.11.7.**

11.4 Anticipated Environmental Impacts

11.4.1 Air Environment

The emissions mainly generated from the mining activities are Blasting, Drilling, Scrapping, Excavation, Loading, Unloading, and transportation etc. Machinery like compressors and jack hammers are used for Drilling.

It was observedthat the maximum ground level concentration observed due to mining activities and traffic movement without control measures for PM10, PM2.5 and NOx are 3.29 µg/m^3, 1.54 µg/m^3 and 2.51 µg/m^3 respectively. The highest concentration levels identified at the project site only. So, it can be concluded that even during operation of quarry the impact envisaged is moderate.

Impacts:

- Mining operation and associated activities are potentially air polluting, and the major air pollutant is suspended particulate matter.
- Impact of fugitive dust emission on flora and fauna
- Reduce photosynthesis in plants due to dust deposition.
- The intensity of dust generation in the mining is influenced by factors such as hardness of rock, mining technology and material handling etc.
- Fugitive dust from quarrying operation affects the mine workers who are directly exposed.
- Diseases like asthma and bronchitis are induced by particulate emission due to mining activities.

Proposed Mitigation Measure:

- Wet Drilling and Control Blasting will be used.
- Developing green belts which act as pollution sinks.
- Regular water sprinkling on haul and access roads.
- Material coverage during transportation to avoid Dust and Mist.
- Vehicular Emissions will be minimized by proper training and maintenance of vehicles and other oil - operated equipment.
- Speed controls on vehicle movements.
- Periodic health checkups for the workers shall be done.

- Dust masks will be provided to the workers.
- Greenbelt development along approach roads and surrounding the Quarry Lease area.

11.4.2 Water Environment

Impacts:

- Runoff from mining areas and contaminated the inland water bodies.
- Impact on groundwater regime/streams/odai/ springs due to mining activities,
- Runoff from Spillage during handling of materials.
- Loss of surface features such as lakes, streams, and ponds through settling.
- Ground water inflows into the quarry & may contact pollutants.

Proposed Mitigation Measure:

- There are no major streams and rivers which can be affected by the proposed mining. Hence there will be no major effect on the surface water environment.
- The Colour Granites will not produce any harmful toxic effluence in the form of solid, liquid or gas.
- Garland drains will be constructed on all sides of the quarry.
- All the garland drains will be routed through adequately sized catchpits or settling pits to remove suspended solids from flowing into storm water.
- The water will be used after settling for irrigation/greenbelt and dust suppression.
- The overall drainage planning will be done so that the existing pre-mining drainage conditions will be maintained to the extent possible so that run off distribution is not affected.
- Rainwater harvesting by constructing check dams on natural nallah and developing water bodies should be planned for recharging groundwater.
- Sewage (0.63 KLD) is being sent to septic tank followed by soak pit. There is no industrial effluent generation during quarry operation.
- 13.5 kg/ Day Municipal Solid Wastes including food waste are being disposed of into local municipal waste disposal bins.

11.4.3 Noise Environment

The baseline study showed that the noise levels in both the Industrial area and in Residential area were within the limit prescribed by CPCB. Designed equipment with noise levels not exceeding beyond the requirements of Occupational Health and Safety Administration Standard will be employed.

11.4.4 Biological Environment

Impacts:

- Loss of vegetation and wildlife habitat.
- Impact on surrounding agricultural land & Impact on groundwater quality due to leachate.

Proposed Mitigation Measure:

- This area hosts common animals. Indian Dogs, Jungle and Domestic cat, Rhesus macaque, Domestic Cows, Buffaloes, Bullocks, and Goat etc. are found amongst mammals. There are some Schedule species like Columba livia (Blue rock pigeon) – Sch – IV, Pavo cristatus (Indian peafowl) - Sch I (Part III), Sus scrofa (Wild boar)- Sch III, Mellivora capensis (Honey badger)- Sch I (Part I), Muntiacus muntjak (Southern red muntjac)- Sch III, Felis chaus (Reed cat) - Sch II (Part I), Viverricula indica (Small Indian civet) - Sch II (Part I), Paradoxurus hermaphroditus (Asian palm civet) - Sch II (Part I), Ratufa macroura (Grizzled giant squirrel) - Sch I (Part I) & Naja naja (Nalla Pambu) - Sch II (Part II) and some vulnerable species like Panthera pardus fusca (Indian leopard)- Sch I (Part I), Melursus ursinus (Indian bear) - Sch I (Part I), Bos gaurus (Indian bison) - Sch I (Part I), Albino gaur (White bison)- Sch I (Part I), Semnopithecus johnii (Nilgiri langur) - Sch I (Part I), Semnopithecus entellus (Gray langurs) - Sch I (Part I), Macaca radiata (Bonnet macaque) - Sch I (Part I), Tetracerus quadricornis (Four-horned antelope) - Sch I (Part I), Rusa unicolor (Sambar) - Sch I (Part I) and Chevrotains (Mouse-deer) - Sch I (Part I). There are few endangered species like Elephas maximus (Asian elephant) - Sch I (Part I), Macaca Silenus (Lion-tailed macaque) - Sch I (Part I), Cuon alpinus (Dhole) - Sch I (Part I), Scandentia (Tree Shrew) - Sch I (Part I) identified in the buffer zone of the study area. There are no rare species identified in the study area.
- There are no National Parks, Sanctuary, Biosphere Reserve, Tiger Reserve, Elephant Reserve, wildlife migratory routes in core and buffer zones within the 1km radius of the project site.
- No wildlife is found in the quarry Lease area. To minimize the impacts and to improve up on the existing eco system Afforestation plan will be envisaged with native plants.
- Lighting will be avoided during nighttime in the quarry. However, the operations will be carried out only in daytime.

11.4.5 Socio Economic

Impacts:

- Impact on the cropping pattern and crop productivity in the buffer zone.
- Impact on community resources such as grazing land
- Mining activity may affect the health of the workers and village people directly.

- Existing roads shall be damaged due to heavy vehicle movement.
- Spillages of material transportation
- Dust deposition on plants and trees.
- Accidental Risks during mining due to unsafe measures

Proposed Mitigation Measure

- Quarrying in this area is not going to have any negative impact on the social or cultural life of the villagers in the nearby vicinity.
- The quarry activity will provide job opportunities, which will help them to develop economically.
- Around 30 people are directly and 20 people indirectly employed, including mining operations. Local villagers residing in the nearby villages will be employed as semi-skilled workers.
- At the end of quarry operations, the total area excavated will be fenced properly and Greenbelt will be developed.
- Control of Spillages and Regular Water sprinkling.
- Avenue Greenbelt development with native plants.
- Renovation of existing roads will be done.
- Rainwater harvesting by constructing check dam on natural nallah and developing water bodies should be planned for recharging groundwater.
- 2% of the project cost is Rs.1,99,940 is allocated under CER &TAMIN will spend 2.5% of project profit under Corporate Social Responsibility (CSR) to the neighborhood villages.

11.5 Alternative Studies

No Alternative Studies for Site and Technology are considered Since; Quarry project is a Site specific. The open cost mining method is a sustainable method.

11.6 Environmental Monitoring Program

A monitoring schedule with respect to Ambient Air Quality, Water & Wastewater Quality, Noise Quality as per State Pollution Control Board (TNPCB) will be maintained.

11.7 Additional Studies

11.7.1 Public Hearing

As per obtained Terms of Reference, the Draft EIA is prepared and will be submitted for Public Consultation, After Public Hearing the minutes of the same will be incorporated into the Final EIA for appraisal of the project to obtained Environmental Clearance as per EIA Notification 2006, and its amendments there after.

11.7.2 Disaster Management Plan

- The salient features of Disaster Management Plan include.
- Emergency shutdown procedure
- Fire protection system, Emergency safety equipment & Reporting and response to emergency. Emergency Helpfrom nearby industries and tie up with nearby industries.

11.7.3 Corporate Environmental Responsibility

As per the provisions of MOEFCC office memorandum F-22-65/2017IA.III dated 1.05.2018, The project proponent has earmarked an investment of Rs. 1,99,940 /- towards CER (being 2% of the total capital cost) and this budget will be allocated as per the committee recommendation during the Public Hearing.

11.8 Benefits of the Proposed Project

- The quarrying activities in this belt will benefit the local people both directly 30 persons & indirect persons are 20 Nos.
- Improvement in Per Capita Income.
- The socio - Economic conditions of the village and distance will enhance due to the project, hence the project should be allowed after considering all the parameters.
- It can thus be concluded that the project is environmentally compatible, financially viable and would be in the interest of the construction industry thereby indirectly benefiting the masses.

11.9 Environmental Benefit Analysis

Not recommended during scoping stage.

11.10 Environmental Management Plan

The EMP provides a delivery mechanism to address potential adverse impacts, to instruct contractors and to introduce standards of good practice to be adopted for all project works. For each stage of the program, the EMP lists all the requirements to ensure effective mitigation of significant biophysical and socio-economic impacts identified in the EIA. The project proponent is proposed EMP budget is Rs 2,05,000/.

11.11 Conclusion and Discussion

The proposal is since the current market Colour Granite stone material has a good requirement in civil construction & another field. There is no agriculture and forest land are involved in the proposed mining land. There are no areas which are important or sensitive for ecological reasons like Wetlands, coastal zones, biospheres, mountains, other than Udedurgam RF ~ 2.99 km (SSE), Denkanikotta RF ~ 3.21 km (S). Few water bodies are in the 15km radius of the project site are Lake near Puvanapalli~ 2.61 km (WSW), Lake near DoddeGaunapalli~ 3.58 km (NNW), etc.,

There are no major industries within this area. A comprehensive listing of the mitigation measures (actions) will be prepared and implemented and the parameters that will be monitored to ensure effective implementation of the action. Also, the timing for implementation of the action to ensure that the objectives of mitigation are fully met to minimize the Impacts on environmental attributes. The quarrying activities will provide benefits to the local people both directly 30 Nos & 20 indirect persons. A total cost of Rs.2,05,000 under Environmental Management Plan cost.

11.12 Disclosure of Consultants

The work of undertaking field studies and preparation of EIA/EMP report under B1 Violation category by M/s. EHS360 Labs Pvt. Ltd., Chennai is accredited by NABET for Schedule 1(a) Mining of Minerals Category B vide Certificate No. NABET/EIA/22-25/IA/0098_Rev.01, valid up to 24.06.2025. Obtained terms of reference (ToR) vide Identification No. TO24B0108TN5942228N, dated:21.09.2024, The Baseline studies were conducted during the period of **March 2024 – May 2024** and EIA report is prepared accordingly based on terms of reference with public hearing and additional TORs. The final EIA/EMP report after public hearing will be submitted to the SEAC/SEIAA for Environmental Clearance for the proposed project.

12 DISCLOSURE OF CONSULTANTS

12.1 Change of Consultant Details

As a part of compliance to the regulatory requirement i.e., to obtain Environmental Clearance from SEIAA, TN, the project proponent has appointed Environmental Consultants accredited by National Accreditation Board for Education and Training (NABET)-Quality Council of India (QCI), New Delhi.

The work of undertaking field/baseline studies and preparation of EIA/EMP report under B1 Violation category by M/s. EHS360 Labs Pvt. Ltd., Chennai is accredited by NABET for Schedule 1(a) Mining of Minerals Category B vide Certificate No. NABET/EIA/22-25/IA/0098_Rev.01, valid up to 24.06.2025. The Proponent obtained terms of reference (ToR) videIdentification No. TO24B0108TN5942228N, dated:21.09.2024, The Baseline studies were conducted during the period of **March 2024 – May 2024** and EIA report is prepared accordingly based on terms of reference with public hearing and additional TORs. The final EIA/EMP report after public hearing will be submitted to the SEAC/SEIAA for Environmental Clearance for the proposed project.

12.2 Brief and Nature of Consultancy

M/s. EHS360 Labs Pvt. Ltd., (EHSL) is one of the pioneer companies in the field of Environmental Consultancy Service providers in India. We are NABET Accredited consultant for conducting Environmental Impact Assessment Studies (EIA) and obtaining Environmental Clearances for 1,7, 8, 21,38 &39 sectors. We also take up services which include Environment Monitoring and Testing, Environment Audit, Risk Assessment Studies, Turnkey solutions, Operation and Maintenance contracts and obtaining various statutory clearances from Ministry of Environment, Forest, and Climate Change (MoEFCC) and State Pollution Control Boards. NABET certificate is attached at the end of this chapter.

12.3 Team Member for EIA report

In addition to the approved experts for NABET, the following members are also involved in the EIA as Team Member/FAA to build their competencies for handling 1 sectors and functional areas

12.4 EIA Team Members

Name of Internal Team Member	Activity / Area	Involvement – Actual Work Performed	Under Approved Expert
Mr. Santhosh Kumar A	Air Quality Modelling & prediction (AQ)	Assisted with FAE & Coordination for data collection, Secondary data analysis, and validating primary data. coordination with FAEs and team members.	Ms. Tushali Jagwani
Mrs. Tatiparthi Rajani	Air Quality Modelling & prediction (AQ)	Assisted with FAE & Coordination for data collection, Secondary data analysis, and validating primary data. coordination with FAEs and team members.	Ms. Tushali Jagwani
Mrs. Tatiparthi Pranay Kumar	Solid and hazardous waste management (SW & HW)	Assisted FAE during Identification of waste generation, studying adequacy of Mitigation measure for management of hazardous waste and contribution to EIA documentation	Mrs. Tatiparthi Rajani

12.5 Copy of QCI NABET Accreditation

भारतीय गुणवत्ता परिषद
QUALITY COUNCIL OF INDIA
QCI

NABET

National Accreditation Board for Education and Training

Certificate of Accreditation

EHS360 Labs Private Limited, Chennai

Old No. 8/2, New No. 10/2, 50th Street, 7th Avenue, Ashok Nagar, Chennai, Tamil Nadu-600083

*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 including opencast/underground mining	1	1 (a) (i)	A
2.	Mineral beneficiation	7	2 (b)	B
3.	Metallurgical industries (ferrous & non-ferrous)	8	3 (a)	B
4.	Synthetic organic chemicals industry	21	5 (f)	B
5.	Building and construction projects	38	8 (a)	B
6.	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in IAAC minutes dated September 2, 2022, and Supplementary Assessment minutes dated December 15, 2023 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/22/2564 dated October 21, 2022. The accreditation needs to be renewed before the expiry date by EHS360 Labs Private Limited, Chennai following due process of assessment.

Issue Date
January 24, 2024

Valid up to
June 24, 2025

Mr. Ajay Kumar Jha
Sr. Director, NABET

Certificate No.
NABET/EIA/22-25/IA 0098_Rev.01

Prof (Dr) Varinder S Kanwar
CEO-NABET

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

END OF THE REPORT

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT ANNEXURES

For

JAKKERY COLOUR GRANITE QUARRY OVER AN EXTENT OF 27.04.5 Ha.

(Schedule 1(a) Mining of Minerals 'B1' (Violation) Category)

Located at

Survey No's : 486(Part) & 736/4
Village : Jakkery
Taluk : Denkanikottai
District : Krishnagiri
State : Tamil Nadu

By

M/s. Tamil Nadu Minerals Limited

No. 31, Kamarajar Salai, Chepauk, Chennai–600005.

ToR Id No. TO24B0108TN5942228N dated:21.09.2024
Baseline period: March 2024 to May 2024
Purpose of report: Submission for Public Hearing

EIA Consultant

M/s. EHS360 Labs Private Limited

Ashok Nagar, Chennai
NABET Certificate No. NABET/EIA/22-25/IA 0098_Rev.01 validity 24th June 2025

NOVEMBER 2024

LIST OF ANNEXURES

File No: 11115
Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment Authority(SEIAA), TAMIL NADU)
***

Dated **21/09/2024**

To,

Sudeep Jain IAS
M/S. TAMIL NADU MINERALS LIMITED
M/s. Tamil Nadu Minerals Limited (Government of Tamil Nadu undertaking) 31 Kamarajar Salai, Chepauk, Chennai, Tamil Nadu., CHENNAI, TAMIL NADU, , 600005
tamin@tamingranites.com

Subject: Grant of **Terms of Reference under violation with Public Hearing** under the provision of the EIA Notification 2006 as amended-regarding.

Sir/Madam,

This is in reference to your application for Grant of Terms of Reference under violation with Public Hearing under the provision of the EIA Notification 2006-regarding in respect of project Proposed Colour Granite Quarry lease over an extent of 27.04.5Ha at SF.Nos. 486(Part) & 736/4 of Jakkery Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu by M/s. Tamil Nadu Minerals Limited submitted to SEIAA vide proposal number SIA/TN/MIN/488460/2024 dated 28/08/2024.

Ref:

1. MoEF & CC Notification S.O. 804 (E) dated 14.03.2017.
2. MoEF & CC Notification S.O.1030 (E) dated 08.03.2018.
3. Online proposal No.SIA/TN/MIN/488460/2024, Dated:18.07.2023.
4. Your Application for Environmental Clearance dated:24.07.2023.
5. Minutes of the 492nd SEAC meeting held on 29.08.2024
6. Minutes of the 753rd SEIAA meeting held on 10.09.2024 &11.09.2024

2. The particulars of the proposal are as below :

(i) TOR Identification No.	TO24B0108TN5942228N
(ii) File No.	11115
(iii) Clearance Type	TOR
(iv) Category	B1
(v) Project/Activity Included Schedule No.	1(a) Mining of minerals
(vii) Name of Project	JAKKERY COLOUR GRANITE QUARRY
(viii) Name of Company/Organization	M/S. TAMIL NADU MINERALS LIMITED
(ix) Location of Project (District, State)	KRISHNAGIRI, TAMIL NADU

(x) Issuing Authority	SEIAA
(xii) Applicability of General Conditions	no
(xiii) Applicability of Specific Conditions	no

3. In view of the particulars given in the Para 1 above, the project proposal interalia including Form-1(Part A and B) were submitted to the SEIAA for an appraisal by the SEAC under the provision of EIA notification 2006 and its subsequent amendments.

4. The above-mentioned proposal has been considered by SEIAA in the meeting held on 10/09/2024. The minutes of the meeting and all the Application and documents submitted [(viz. Form-1 Part A, Part B, Part C EIA, EMP)] are available on PARIVESH portal which can be accessed by scanning the QR Code above.

5. The SEAC, based on information & clarifications provided by the project proponent and after detailed deliberations recommended the proposal for grant of Terms of Reference under the provision of EIA Notification, 2006 and as amended thereof subject to stipulation of specific and general conditions as detailed in Annexure (2).

6. The SEIAA has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after accepting the recommendations of the SEAC hereby decided to grant **Terms of Reference (ToR) under violation with Public Hearing** for instant proposal of M/s. Sudeep Jain IAS under the provisions of EIA Notification, 2006 and as amended thereof.

7. The Ministry/SEIAA reserves the right to stipulate additional conditions, if found necessary.

8. The Terms of Reference (ToR) under violation with Public Hearing to the aforementioned project is under provisions of EIA Notification, 2006. It does not tantamount to approvals/consent/permissions etc. required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/ Regulations or Statutes, as applicable, to the project.

9. The TORs prescribed shall be **valid for a period of three years** from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29th August, 2017.

10. This issues with the approval of the Competent Authority.

Copy To

1. The Additional Chief Secretary to Government, Environment, Climate Change and Forests Department, Govt. of Tamil Nadu, Fort St. George, Chennai - 9.
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan,
CBD Cum-Office Complex, East Arjun Nagar, New Delhi - 110 032.
3. The Chairman, Tamil Nadu Pollution Control Board,
76, Mount Salai, Guindy, Chennai - 600 032.
4. The APCCF (C), Regional Office, MoEF & CC (SZ), 34, HEPC Building, 1st & 2nd Floor, Cathedral Garden Road, Nungambakkam, Chennai - 34.
5. Monitoring Cell, IA Division, Ministry of Environment, Forests & CC,
Paryavaran Bhavan, CGO Complex, New Delhi - 110 003.
6. The District Collector, Krishnagiri District.
7. Stock File

Annexure 1

Specific Terms of Reference for (Mining Of Minerals)

1. Seac Conditions - Site Specific

S. No	Terms of Reference
1.1	1. Since Cauvery North is located at a distance of 2.8km, the PP shall propose conservation measures in consultation with DFO and include the same in the Environmental Management Plan. 2. The PP shall furnish the study report of implications of mining on Flora and Fauna. 3. The PP shall furnish the study report of wind flow pattern and their characteristics. 4. The PP shall furnish the study report of water flow direction and discharge of water resources. 5. The PP shall furnish the green belt development photographs along with Geo Coordinates. 6. The PP shall furnish the detail study of siltation of mining deposits on check dams and river beds.

2. Seac Standard Conditions

S. No	Terms of Reference
2.1	1. In the case of existing/operating mines, a letter obtained from the concerned AD (Mines) shall be submitted and it shall include the following: (i) Original pit dimension (ii) Quantity achieved Vs EC Approved Quantity (iii) Balance Quantity as per Mineable Reserve calculated. (iv) Mined out Depth as on date Vs EC Permitted depth (v) Details of illegal/illicit mining (vi) Violation in the quarry during the past working. (vii) Quantity of material mined out outside the mine lease area (viii) Condition of Safety zone/benches (ix) Revised/Modified Mining Plan showing the benches of not exceeding 6 m height and ultimate depth of not exceeding 50m. 2. Details of habitations around the proposed mining area and latest VAO certificate regarding the location of habitations within 300m radius from the periphery of the site. 3. The proponent is requested to carry out a survey and enumerate on the structures located within the radius of (i) 50 m, (ii) 100 m, (iii) 200 m and (iv) 300 m (v) 500m shall be enumerated with details such as dwelling houses with number of occupants, whether it belongs to the owner (or) not, places of worship, industries, factories, sheds, etc with indicating the owner of the building, nature of construction, age of the building, number of residents, their profession and income, etc. 4. The PP shall submit a detailed hydrological report indicating the impact of proposed quarrying operations on the waterbodies like lake, water tanks, etc are located within 1 km of the proposed quarry. 5. The Proponent shall carry out Bio diversity study through reputed Institution and the same shall be included in EIA Report. 6. The DFO letter stating that the proximity distance of Reserve Forests, Protected Areas, Sanctuaries, Tiger reserve etc., up to a radius of 25 km from the proposed site. 7. In the case of proposed lease in an existing (or old) quarry where the benches are not formed (or) partially formed as per the approved Mining Plan, the Project Proponent (PP) shall the PP shall carry out the scientific studies to assess the slope stability of the working benches to be constructed and existing quarry wall, by involving any one of the reputed Research and Academic Institutions - CSIR-Central Institute of Mining & Fuel Research / Dhanbad, NIRM/Bangalore, Division of Geotechnical Engineering-IIT-Madras, NIT-Dept of Mining Engg, Surathkal, and Anna University Chennai-CEG Campus. The PP shall submit a copy of the aforesaid report indicating the stability status of the quarry wall and possible mitigation measures during the time of appraisal for obtaining the EC. 8. However, in case of the fresh/virgin quarries, the Proponent shall submit a conceptual 'Slope Stability Plan' for the proposed quarry during the appraisal while obtaining the EC, when the depth

S. No	Terms of Reference
	of the working is extended beyond 30 m below ground level. 9. The PP shall furnish the affidavit stating that the blasting operation in the proposed quarry is carried out by the statutory competent person as per the MMR 1961 such as blaster, mining mate, mine foreman, II/I Class mines manager appointed by the proponent. 10. The PP shall present a conceptual design for carrying out only controlled blasting operation involving line drilling and muffle blasting in the proposed quarry such that the blast-induced ground vibrations are controlled as well as no fly rock travel beyond 30 m from the blast site. 11. The EIA Coordinators shall obtain and furnish the details of quarry/quarries operated by the proponent in the past, either in the same location or elsewhere in the State with video and photographic evidences. 12. If the proponent has already carried out the mining activity in the proposed mining lease area after 15.01.2016, then the proponent shall furnish the following details from AD/DD, mines, 13. What was the period of the operation and stoppage of the earlier mines with last work permit issued by the AD/DD mines? 14. Quantity of minerals mined out. · Highest production achieved in any one year · Detail of approved depth of mining. · Actual depth of the mining achieved earlier. · Name of the person already mined in that leases area. · If EC and CTO already obtained, the copy of the same shall be submitted. · Whether the mining was carried out as per the approved mine plan (or EC if issued) with stipulated benches. 15. All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/Topo sheet, topographic sheet, geomorphology, lithology and geology of the mining lease area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone). 16. The PP shall carry out Drone video survey covering the cluster, green belt, fencing, etc., 17. The proponent shall furnish photographs of adequate fencing, green belt along the periphery including replantation of existing trees & safety distance between the adjacent quarries & water bodies nearby provided as per the approved mining plan. 18. The Project Proponent shall provide the details of mineral reserves and mineable reserves, planned production capacity, proposed working methodology with justifications, the anticipated impacts of the mining operations on the surrounding environment, and the remedial measures for the same. 19. The Project Proponent shall provide the Organization chart indicating the appointment of various statutory officials and other competent persons to be appointed as per the provisions of the Mines Act'1952 and the MMR, 1961 for carrying out the quarrying operations scientifically and systematically in order to ensure safety and to protect the environment. 20. The Project Proponent shall conduct the hydro-geological study considering the contour map of the water table detailing the number of groundwater pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds, etc. within 1 km (radius) along with the collected water level data for both monsoon and non-monsoon seasons from the PWD / TWAD so as to assess the impacts on the wells due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. 21. The proponent shall furnish the baseline data for the environmental and ecological parameters with regard to surface water/ground water quality, air quality, soil quality & flora/fauna including traffic/vehicular movement study. 22. The Proponent shall carry out the Cumulative impact study due to mining operations carried out in the quarry specifically with reference to the specific environment in terms of soil health, biodiversity, air pollution, water pollution, climate change and flood control & health impacts. Accordingly, the Environment Management plan should be prepared keeping the concerned quarry

S. No	Terms of Reference
	and the surrounding habitations in the mind. 23. Rain water harvesting management with recharging details along with water balance (both monsoon & non-monsoon) be submitted. 24. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given. 25. Details of the land for storage of Overburden/Waste Dumps (or) Rejects outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be provided. 26. Proximity to Areas declared as 'Critically Polluted' (or) the Project areas which attracts the court restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the TNPCB (or) Dept. of Geology and Mining should be secured and furnished to the effect that the proposed mining activities could be considered. 27. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided. 28. Impact on local transport infrastructure due to the Project should be indicated. 29. A tree survey study shall be carried out (nos., name of the species, age, diameter etc.,) both within the mining lease applied area & 300m buffer zone and its management during mining activity. 30. A detailed mine closure plan for the proposed project shall be included in EIA/EMP report which should be site-specific. 31. As a part of the study of flora and fauna around the vicinity of the proposed site, the EIA coordinator shall strive to educate the local students on the importance of preserving local flora and fauna by involving them in the study, wherever possible. 32. The purpose of Green belt around the project is to capture the fugitive emissions, carbon sequestration and to attenuate the noise generated, in addition to improving the aesthetics. A wide range of indigenous plant species should be planted as given in the appendix-I in consultation with the DFO, State Agriculture University. The plant species with dense/moderate canopy of native origin should be chosen. Species of small/medium/tall trees alternating with shrubs should be planted in a mixed manner. 33. Taller/one year old Saplings raised in appropriate size of bags, preferably ecofriendly bags should be planted as per the advice of local forest authorities/botanist/Horticulturist with regard to site specific choices. The proponent shall earmark the greenbelt area with GPS coordinates all along the boundary of the project site with at least 3 meters wide and in between blocks in an organized manner 34. A Disaster management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period. 35. A Risk Assessment and management Plan shall be prepared and included in the EIA/EMP Report for the complete life of the proposed quarry (or) till the end of the lease period. 36. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed. 37. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations. 38. The Socio-economic studies should be carried out within a 5 km buffer zone from the mining activity. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative

S. No	Terms of Reference
	dimensions may be given with time frames for implementation. 39. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given. 40. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc. 41. If any quarrying operations were carried out in the proposed quarrying site for which now the EC is sought, the Project Proponent shall furnish the detailed compliance to EC conditions given in the previous EC with the site photographs which shall duly be certified by MoEF&CC, Regional Office, Chennai (or) the concerned DEE/TNPCB. 42. The PP shall prepare the EMP for the entire life of mine and also furnish the sworn affidavit stating to abide the EMP for the entire life of mine. 43. Concealing any factual information or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this Terms of Conditions besides attracting penal provisions in the Environment (Protection) Act, 1986.

3. Seiaa Specific Conditions

S. No	Terms of Reference
3.1	After detailed discussions, the Authority accepts the recommendation of SEAC and decided to grant **Terms of Reference (ToR) under violation category with Public Hearing** for the quantity of the production should not exceed 41,604m^3 (110251 Tonnes) of Run of Mines, 10,400m^3 (27560 Tonnes) of Saleable Colour Granite Recovery@25%, 31,204m^3 (82691 Tonnes) of Saleable Colour Granite Waste Recovery @75% with an ultimate depth of mining is 30m from the top of the hill. As per the approved mining plan undertaking EIA study followed by the EMP report along with the assessment of ecological damage, remediation plan and natural and community resource augmentation plan pertaining to violation projects and it shall be prepared as an independent chapter by the accredited consultants subject to the conditions as recommended by SEAC & normal / Standard conditions in addition to the following conditions and conditions stated therein vide **Annexure 'B'.** Further MS-SEIAA may write to government to take credible action against the proponent under section 19 of Environment Protection Act, 1986 as indicated by SEAC. 1. The PP shall furnish a Copy of valid mining lease approval obtained from the competent Authority. 2. The PP shall furnish Copy of mining plan approved by the competent authority of the Dept of Geology and Mining. 3. The PP shall furnish EMP for the project life including progressive mine closure plan and final mine closure plan with detailed budget plan. 4. The PP shall study in detail about the CO_2 release and temperature rise and the project activities that add to micro climate alternations and the same shall be included in the final EIA report. 5. The PP shall study in detail about impact of the proposed mining activity on the water bodies and natural flow of surface and ground water and the same shall be included in the final EIA report. 6. The PP shall study in detail about Possibilities of water contamination and impact on aquatic ecosystem health. 7. The PP shall study the impact on Invasive Alien Species (IAP).
3.2	**SEIAA Standard Conditions** **<u>Cluster Management Committee</u>** 1. Cluster Management Committee shall be framed which must include all the proponents in the cluster as members including the existing as well as proposed quarry. 2. The members must coordinate among themselves for the effective implementation of EMP as

S. No	Terms of Reference
	committed including Green Belt Development, Water sprinkling, tree plantation, blasting etc., 3. The List of members of the committee formed shall be submitted to AD/Mines before the execution of mining lease and the same shall be updated every year to the AD/Mines. 4. Detailed Operational Plan must be submitted which must include the blasting frequency with respect to the nearby quarry situated in the cluster, the usage of haul roads by the individual quarry in the form of route map and network. 5. The committee shall deliberate on risk & emergency management plan, fire safety & evacuation plan and sustainable development goals pertaining to the cluster in a holistic manner especially during natural calamities like intense rain and the mitigation measures considering the inundation of the cluster and evacuation plan. 6. The Cluster Management Committee shall form Environmental Policy to practice sustainable mining in a scientific and systematic manner in accordance with the law. The role played by the committee in implementing the environmental policy devised shall be given in detail in the EIA Report. 7. The committee shall furnish action plan regarding the restoration strategy with respect to the individual quarry falling under the cluster in a holistic manner. 8. The committee shall deliberate on the health of the workers/staff involved in the mining as well as the health of the public in the vicinity. **Agriculture & Agro-Biodiversity** 9. Impact on surrounding agricultural fields around the proposed mining Area. 10. Impact on soil flora & vegetation around the project site. 11. Details of type of vegetation including no. of trees & shrubs within the proposed mining area and. If so, transplantation of such vegetation all along the boundary of the proposed mining area shall committed mentioned in EMP. 12. The Environmental Impact Assessment should study the agro-biodiversity, agro-forestry, horti-cultural plantations, the natural ecosystem, the soil micro flora, fauna and soil seed banks and suggest measures to maintain the natural Ecosystem. 13. Action should specifically suggest for sustainable management of the area and restoration of ecosystem for flow of goods and services. 14. The project proponent shall study and furnish the impact of project on plantations in adjoining patta lands, Horticulture, Agriculture and livestock. **Forests** 15. The project proponent shall detailed study on impact of mining on Reserve forests and free ranging wildlife. 16. The Environmental Impact Assessment should study impact on forest, vegetation, endemic, vulnerable and endangered indigenous flora and fauna. 17. The Environmental Impact Assessment should study impact on standing trees and the existing trees should be numbered and action suggested for protection. 18. The Environmental Impact Assessment should study impact on protected areas, Reserve Forests, National Parks, Corridors and Wildlife pathways, near project site. **Water Environment** 19. Hydro-geological study considering the contour map of the water table detailing the number of ground water pumping & open wells, and surface water bodies such as rivers, tanks, canals, ponds etc. within 1 km (radius) so as to assess the impacts on the nearby waterbodies due to mining activity. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided, covering the entire mine lease period. 20. Erosion Control measures. 21. Detailed study shall be carried out in regard to impact of mining around the proposed mine lease area on the nearby Villages, Water-bodies/ Rivers, & any ecological fragile areas. 22. The project proponent shall study impact on fish habitats and the food WEB/ food chain in the water body and Reservoir.

S. No	Terms of Reference
	23. The project proponent shall study and furnish the details on potential fragmentation impact on natural environment, by the activities. 24. The project proponent shall study and furnish the impact on aquatic plants and animals in water bodies and possible scars on the landscape, damages to nearby caves, heritage site, and archaeological sites possible land form changes visual and aesthetic impacts. 25. The Terms of Reference should specifically study impact on soil health, soil erosion, the soil physical, chemical components and microbial components. 26. The Environmental Impact Assessment should study on wetlands, water bodies, rivers streams, lakes and farmer sites. 27. The EIA shall include the impact of mining activity on the following: a) Hydrothermal/Geothermal effect due to destruction in the Environment. b) Bio-geochemical processes and its foot prints including environmental stress. c) Sediment geochemistry in the surface streams. **Energy** 28. The measures taken to control Noise, Air, Water, Dust Control and steps adopted to efficiently utilise the Energy shall be furnished. **Climate Change** 29. The Environmental Impact Assessment shall study in detail the carbon emission and also suggest the measures to mitigate carbon emission including development of carbon sinks and temperature reduction including control of other emission and climate mitigation activities. 30. The Environmental Impact Assessment should study impact on climate change, temperature rise, pollution and above soil & below soil carbon stock, soil health and physical, chemical & biological soil features. 31. Impact of mining on pollution leading to GHGs emissions and the impact of the same on the local livelihood. **Mine Closure Plan** 32. Detailed Mine Closure Plan covering the entire mine lease period as per precise area communication order issued. **EMP** 33. Detailed Environment Management Plan along with adaptation, mitigation & remedial strategies covering the entire mine lease period as per precise area communication order issued and the scope for achieving SDGs. 34. The Environmental Impact Assessment should hold detailed study on EMP with budget for Green belt development and mine closure plan including disaster management plan. **Risk Assessment** 35. To furnish risk assessment and management plan including anticipated vulnerabilities during operational and post operational phases of Mining. **Disaster Management Plan** 36. To furnish disaster management plan and disaster mitigation measures in regard to all aspects to avoid/reduce vulnerability to hazards & to cope with disaster/untoward accidents in & around the proposed mine lease area due to the proposed method of mining activity & its related activities covering the entire mine lease period as per precise area communication order issued. **Others** 37. The project proponent shall furnish VAO certificate with reference to 300m radius regard to approved habitations, schools, Archaeological sites, Structures, railway lines, roads, water bodies such as streams, odai, vaari, canal, channel, river, lake pond, tank etc. 38. As per the MoEF& CC office memorandum F.No.22-65/2017-IA.III dated: 30.09.2020 and 20.10.2020 the proponent shall address the concerns raised during the public consultation and all the activities proposed shall be part of the Environment Management Plan. 39. The project proponent shall study and furnish the possible pollution due to plastic and microplastic on the environment. The ecological risks and impacts of plastic & microplastics on aquatic environment and fresh water systems due to activities, contemplated during mining may be

S. No	Terms of Reference
	investigated and reported.

Standard Terms of Reference for (Mining of minerals)

1.

S. No	Terms of Reference
1.1	An EIA-EMP Report shall be prepared for peak capacity (…..MTPA)operation in an ML/project area of.....ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.
1.2	An EIA-EMP Report would be prepared for peak capacity operation to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modeling for..... MTPA of mineral production based on approved project/Mining Plan for.....MTPA. Baseline data collection can be for any season (three months) except monsoon.
1.3	Propoer KML file with pin drop and coordinate of mine at 500-1000 m interval be provided
1.4	A Study area map of the core zone (project area) and 10 km area of the buffer zone (1: 50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries, mines and other polluting sources. In case of ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found in the 15 km study area should be given. The above details to be furnished in tabular form also
1.5	Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas (as per records), along with other physical features such as water bodies, etc should be furnished.
1.6	A contour map showing the area drainage of the core zone and 25 km of the study area (where the water courses of the core zone ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.
1.7	Catchment area with its drainage map of 25 km area within and outside the mine shall be provided with names, details of rivers/ riverlet system and its respective order. The map should clearly indicate drainage pattern of the catchment area with basin of major rivers. Diversion of drains/ river need eloboration in form of lengthe, quantity and quality of water to be diverted
1.8	(Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure plan approval of Competent Authority should be furnished for green field and expansion projects.

S. No	Terms of Reference
1.9	Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology and equipment proposed to be used vis-à-vis the potential impacts should be provided.
1.10	Impact of mining on hydrology, modification of natural drainage, diversion and channeling of the existing rivers/water courses flowing though the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.
1.11	A detailed Site plan of the mine showing the proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, Stockyard, township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of embankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads, major haul roads, etc should be indicated.
1.12	Original land use (agricultural land/forestland/grazing land/wasteland/water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations should be analyzed. Extent of area under surface rights and under mining rights should be specified. Area under Surface Rights S.N ML/Project Land use Area under Surface Rights(ha) Area Under Mining Rights(ha) Area under Both (ha) 1 Agricultural land 2 Forest Land 3 Grazing Land 4 Settlements 5 Others (specify) S.N. Details Area (ha) 1 Buildings 2 Infrastructure 3 Roads 4 Others (specify) Total
1.13	Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and fauna duly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained and furnished.
1.14	One-season (other than monsoon) primary baseline data on environmental quality - air (PM10,

S. No	Terms of Reference
	PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/ MoEF&CC certification of the respective laborartory and NABET accreditation of the consultant to be provided.
1.15	Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Observed values should be provided along with the specified standards.
1.16	For proper baseline air quality assessment, Wind rose pattern in the area should be reviewed and accordingly location of AAMSQ shall be planned by the collection of air quality data by adequate monitoring stations in the downwind areas. Monitoring location for collecting baseline data should cover overall the 10 km buffer zone i.e. dispersed in 10 km buffer area. In case of expansion, the displayed data of CAAQMS and its comparison with the monitoring data to be provided
1.17	A detailed traffic study along with presence of habitation in 100 mts distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along the road which will indirectly contribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report.
1.18	The socio-economic study to conducted with actual survey report and a comparative assessment to be provided from the census data should be provided in EIA/ EMP report also occupational status & economic status of the study area and what economically project will contribute should be clearly mention. The study should also include the status of infrastructural facilities and amenities present in the study area and a comparative assessment with census data to be provided and to link it with the initialization and quantification of need based survey for CSR activities to be followed.
1.19	The Ecology and biodiversity study should also indicate the likely impact of change in forest area for surface infrastructural development or mining activity in relation to the climate change of that area and what will be the compensatory measure to be adopted by PP to minimize the impact of forest diversion.
1.20	Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower for the mine should be submitted.
1.21	Impact of proposed project/activity on hydrological regime of the area shall be assessed and report be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted
1.22	Impact of mining and water abstraction from the mine on the hydrogeology and groundwater regime within the core zone and 10 km buffer zone including long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/or if the area falls within dark/grey zone.

S. No	Terms of Reference
1.23	Study on land subsidence including modeling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues should be carried out.
1.24	Detailed water balance should be provided. The break up of water requirement as per different activities in the mining operations, including use of water for sand stowing should be given separately. Source of water for use in mine, sanction of the Competent Authority in the State Govt. and impacts vis-à-vis the competing users should be provided.
1.25	PP shall submit design details of all Air Pollution control equipment (APCEs) to be implemented as part of Environment Management Plan vis-à-vis reduction in concentration of emission for each APCEs
1.26	PP shall propose to use LNG/CNG based mining machineries and trucks for mining operation and transportation of mineral. The measures adopted to conserve energy or use of renewable sources shall be explored
1.27	PP to evaluate the green house emission gases from the mine operation/ washery plant and corresponding carbon absorption plan.
1.28	Site specific Impact assessment with its mitigation measures, Risk Assessment and Disaster Preparedness and Management Plan should be provided.
1.29	Impact of choice of mining method, technology, selected use of machinery and impact on air quality, mineral transportation, handling & storage/stockyard, etc, Impact of blasting, noise and vibrations should be provided.
1.30	Impacts of mineral transportation within the mining area and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions should be provided. Impacts of transportation, handling, transfer of mineral and waste on air quality, generation of effluents from workshop etc, management plan for maintenance of HEMM and other machinery/equipment should be given. Details of various facilities such as rest areas and canteen for workers and effluents/pollution load emanating from these activities should also be provided.
1.31	Details of various facilities to be provided to the workers in terms of parking, rest areas and canteen, and effluents/pollution load resulting from these activities should also be given.
1.32	The number and efficiency of mobile/static water jet, Fog cannon sprinkling system along the main mineral transportation road inside the mine, approach roads to the mine/stockyard/siding, and also the frequency of their use in impacting air quality should be provided.
1.33	Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the pre- mining status should be provided. A Plan for the ecological restoration of the mined out area and post mining land use should be prepared with detailed cost provisions. Impact and management of wastes and issues of re-handling (wherever applicable) and backfilling and progressive mine closure and reclamation should be furnished.
1.34	Adequate greenbelt nearby areas, mineral stock yard and transportation area of mineral shall be provided with details of species selected and survival rate Greenbelt development should be undertaken particularly around the transport route.

S. No	Terms of Reference
1.35	Cost of EMP (capital and recurring) should be included in the project cost and for progressive and final mine closure plan.
1.36	Details of R&R. Detailed project specific R&R Plan with data on the existing socio- economic status of the population (including tribals, SC/ST, BPL families) found in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc and costs along with the schedule of the implementation of the R&R Plan should be given.
1.37	CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project should be given.
1.38	Corporate Environment Responsibility:
1.39	a) The Company must have a well laid down Environment Policy approved by the Board of Directors.
1.40	b) The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.
1.41	c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.
1.42	d) To have proper checks and balances, the company should have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.
1.43	e) Environment Managament Cell and its responsibilities to be clearly spleel out in EIA/ EMP report
1.44	f) In built mechanism of self-monitoring of compliance of environmental regulations should be indicated.
1.45	Status of any litigations/ court cases filed/pending on the project should be provided.
1.46	PP shall submit clarification from DFO that mine does not falls under corridors of any National Park and Wildlife Sanctuary with certified map showing distance of nearest sanctuary.
1.47	Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closer plan approval. NOC from Flood and Irrigation Dept. (if req.), etc. wherever applicable.
1.48	Details on the Forest Clearance should be given as per the format given: Total ML Project Area (ha) / Total Forest land (ha) / If more than one provide details of / Date of FC / Extent of Forest Land / Balance area for which FC is yet to be obtained / Status of appl For diversion of forest land

S. No	Terms of Reference
	each FC
1.49	In case of expansion of the proposal, the status of the work done as per mining plan and approved mine closure plan shall be detailed in EIA/ EMP report
1.50	Details on Public Hearing should cover the information relating to notices issued in the newspaper, proceedings/minutes of Public Hearing, the points raised by the general public and commitments made by the proponent and the time bound action proposed with budgets in suitable time frame. These details should be presented in a tabular form. If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided.
1.51	PP shall carry out survey through drone highlighting the ground reality for atleast 10 minutes
1.52	Detailed Chronology of the project starting from the first lease deed alloted/Block allotment/ Land acquired to its No. of renewals, CTO /CTE with details of no. renewals, previous EC(s) granted details and its compliance details, NOC details from various Govt bodies like Forest NOC(s), CGWA permissions, Power permissions, etc as per the requisites respectively to be furnished in tabular form.
1.53	The first page of the EIA/ EMP report must mention the peak capacity production, area, detail of PP, Consultant (NABET acrreditation) and Laboratory (NABL / MoEF & CC certification)
1.54	The compliances of ToR must be properly cited with respective chapter section and page no in tabular form and also mention sequence of the respective ToR complied within the EIA-EMP report in all the chapter,s section.

Additional TOR specified by the SEAC to deal with the violation aspects of the mining projects

SECTION A

As per the MoEF & CC Notification S.O. 1030 (E) dated: 08.03.2018,

1. "The cases of violations will be appraised by the Expert Appraisal Committee at the Central level or State or Union territory level Expert Appraisal Committee constituted under sub-section (3) of section 3 of the Environment (Protection) Act, 1986 with a view to assess that the project has been constructed at a site which under prevailing laws is permissible and expansion has been done which can run sustainably under compliance of environmental norms with adequate environmental safeguards, and in case, where the findings of Expert Appraisal Committee for projects under category A or State or Union territory level Expert Appraisal Committee for projects under category B is negative, closure of the project will be recommended along with other actions under the law.

2. In case, where the findings of the Expert Appraisal Committee or State or Union territory level Expert Appraisal Committee on point at sub-paragraph (4) above are affirmative, the projects will be granted the appropriate Terms of Reference for undertaking Environment Impact Assessment and preparation of Environment Management Plan and the Expert Appraisal Committee or State or Union territory level Expert Appraisal Committee, will prescribe specific Terms of Reference for the project on assessment of ecological damage, remediation plan and natural and community resource augmentation plan and it shall be prepared as an independent chapter in the environment impact assessment report by the accredited consultants, and the collection and analysis of data for assessment of ecological damage, preparation of remediation plan and natural and community resource augmentation plan shall be done by an environmental laboratory duly notified under the Environment (Protection) Act, 1986, or a environmental laboratory accredited by the National Accreditation Board for Testing and Calibration Laboratories, or a laboratory of the Council of Scientific and Industrial Research institution working in the field of environment."

After the appraisal of the project, the SEAC decided that the Para No.2 stated above is applicable to the project. Hence, the proponent is directed to prepare appropriate reports as contained in the Para 2.

While complying with the specific aspects of the MoEF & CC directions as stated in the Para 2 above, the following steps should be followed:

Step 1: Enumerate the aspects of Violation:

a) The proponent should enumerate the violations as applicable to the project.
b) Furnish a description of each violation with quantitative and qualitative data.
c) Violation categories are to be decided taking into consideration the stage at which the project execution stands.

Step 2: Ecological Damage Assessment:

a) For each aspect of violation enumerated in step (1), identify the resultant environmental damage that may have been caused.
b) Furnish a description of the environmental damages with quantitative and qualitative data.

Step 3: Remediation Plan:

a) For the Environmental damage(s) identified in the step (2) above, prepare the remediation plan for the each or combination of damages.
b) The remediation plan should essentially consists of problem statement, target to be achieved (quantity), standards, technology/ procedure for remediation, equipment and machinery to be used, time schedule and remediation cost(direct and indirect cost, capital as well as O&M costs).

SECTION B

1. Natural resource Augmentation:
    a) The resources that should be considered for augmentation should essentially consist of land, biota, air, water and other resources as applicable.
    b) Proponent may choose one or more of the resource augmentation as applicable and provide a description of the augmentation proposal in detail for each resource.
    c) The proponent should also furnish the cost for each augmentation scheme.
2. Community resource Augmentation:
    a) The proponent should prepare a plan of action for addressing the needs of the community in terms of resources in the sectors of education, health and sports

primarily and other such resources as applicable to the community in the vicinity of the project.

b) The community resource augmentation plan should consist of rehabilitation of houses and people, budget allocation and time schedule for completing the activity.

SECTION C

The proponent should prepare content for the ecological damage assessment, remediation plan, natural resource augmentation and community resource augmentation separately in a chapter and include in the EIA / EMP report.

SECTION D

a) After the appraisal of the EIA / EMP report submitted by the proponent, the SEAC will make a judgement of the quality of the content in the EIA / EMP report specifically with reference to the chapter covering the ecological damage assessment, remediation plan, natural resource augmentation and community resource augmentation.

b) In the judgement of SEAC, if the quality of the content in the chapter is not satisfactory, the SEAC may direct the proponent to further revise the chapter and resubmit the EIA/EMP report.

c) If SEAC concludes that the technical part is satisfactory and the costing aspect is not satisfactory then the SEAC may revert to legal provisions, MoEF & CC guidelines and similar expert committee recommendations for finalizing the cost aspects or the SEAC may use its own expertise and experience in finalizing the cost.

SECTION E

The proponent is directed to furnish data as per the questionnaire appended in Annexure I. It will help the SEAC in arriving the ecological damage and the associated cost.

SECTION F

In compliance with the Supreme Court order stated in MoEF & CC letter F.No. 3-50/2017 IA.III-pt dated: 05th January 2018, the proponent is required to submit the No Objection Certificate obtained from the Department of Geology and Mining, Government of

Tamil Nadu regarding payment of 100% cost of illegally mined mineral under section 21(5) of MMDR Act 1957 which would account for mining operations in violation of the following:

a) Without Environmental Clearance (EC), or in excess of the quantity approved in EC
b) Without Consent to Operate (CTO) or in excess of the quantity approved in CTO and
c) Without mining plan/scheme of mining or in excess of the quantity approved in mining plan / scheme of mining
d) Without Forest Clearance
e) Any other violation

List out the details of reserve forest and wildlife sanctuary nearby the project site (the details should also include other districts which are nearby the project site) and also furnish the detail of distance between the project site and reserve forests/wildlife sanctuary.

Whether the project site attracts the HACA clearance? If so, also furnish the HACA clearance for the mining from the competent authority.

The proponent is instructed to fill in the form contained in **Annexure 1** to work out the details of the ecological damage during the violation period.

A. STANDARD TERMS OF REFERENCE

1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.

2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.

3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.

4) All corner coordinates of the mine lease area, superimposed on a High Resolution

Imagery/ topo sheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).

5) Information should be provided in Survey of India Topo sheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.

6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.

7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.

8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.

9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.

10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.

11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.

12) A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.

13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.

14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.

15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.

16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.

17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.

18) A detailed biological study of the study area [core zone and buffer zone (10 km

radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.

19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should

also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.

20) Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).

21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.

22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)]primary baseline data on ambient air quality as per

CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.

23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of Vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.

24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.

25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.

26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.

27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.

28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and

copy furnished.

29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.

30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.

31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.

32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.

33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.

34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.

35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with

required facilities proposed in the mining area may be detailed.

36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.

37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.

38) Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.

39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.

40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.

41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.

42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.

43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.

44) Besides the above, the below mentioned general points are also to be followed:-

a) Executive Summary of the EIA/EMP Report

b) All documents to be properly referenced with index and continuous page numbering.

c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.

d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original

analysis/testing reports should be available during appraisal of the Project.

e) Where the documents provided are in a language other than English, an English translation should be provided.

f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.

g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.

h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.

i) As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.

j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

In addition to the above, the following shall be furnished:-

The Executive summary of the EIA/EMP report in about 8-10 pages should be prepared incorporating the information on following points:

1) Project name and location (Village, District, State, Industrial Estate (if applicable).
2) Products and capacities. If expansion proposal then existing products with capacities and reference to earlier EC.
3) Requirement of land, raw material, water, power, fuel, with source of supply

(Quantitative)

4) Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes.
5) Measures for mitigating the impact on the environment and mode of discharge or disposal.
6) Capital cost of the project, estimated time of completion.
7) Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./ private land, status of is acquisition, nearby (in 2-3 km.) water body, population, with in 10km other industries, forest , eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary)
8) Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population
9) Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk.
10) Likely impact of the project on air, water, land, flora-fauna and nearby population
11) Emergency preparedness plan in case of natural or in plant emergencies
12) Issues raised during public hearing (if applicable) and response given
13) CER plan with proposed expenditure.
14) Occupational Health Measures
15) Post project monitoring plan

Besides the above, the below mentioned **general points** should also be followed:-

a. A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.
b. All documents may be properly referenced with index, page numbers and continuous page numbering.
c. Copy of permission related to Port facility, Desalination plant, wind mill /solar power plant from competent Authority.
d. Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.
e. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.

f. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCl)/National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. In this regard circular no F. No.J -l1013/77/2004-IA-II(I) dated 2nd December, 2009,18th March 2010, 28th May 2010 , 28th June 2010 ,31st December 2010 & 30th September 2011 posted on the Ministry's website http://www.moef.nic.in/ may be referred.

- After preparing the EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above mentioned points, the proponent will take further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.
- The final EIA report shall be submitted to the SEIAA, Tamil Nadu for obtaining Environmental Clearance
- The TORs prescribed shall be **valid for a period of three years** from the date of issue, for submission of the EIA/EMP report as per OMNo.J-11013/41/2006-IA-II(I)(part) dated 29th August, 2017.

Annexure 1

Additional information for considering EC for mining projects

S.No.	Details to be provided	Page no.
1)	Name of the project lease & owner	
2)	Lease Extent	
3)	Lease Validity	
4)	Approved Mining Plan/Scheme – Review a) Specify whether DSR is provided (applicable in case of minor minerals only)	

5)	Specify - Nature and type of violation	
	I. Without EC or in excess of quantity approved in EC	
	II. Without CTO or in excess of quantity approved in CTO	
	III. Without mining plan/Scheme of mining or in excess of quantity approved in Mining plan/Scheme of mining.	
	IV. Without forest Clearance	
	V. Any other violation	
6)	Violation period	
	I. Number of months	
	II. Number of Years	
7)	Exploitation/Excavation quantity- Reserves proved through exploration by drilling	
8)	Give details of production from the date of execution of the lease deed / since 1994	

Year and quantity	2010-11*		2011-12*		2012-13*	
	Planned	Actual	Planned	Actual	Planned	Actual
Ore/mineral/granite blocks (tonnes)						
Waste (tonnes/cu.m)						
* year of mining operation						

9)	Quantity mined out during the violation period & if, yes indicate the violated quantity, in term of % of consented quantity.	

Year and quantity mined out during the violation period	2010-11		2011-12		2012-13	
	Planned	Actual	Planned	Actual	Planned	Actual

	Ore/mineral/granite blocks (tonnes)							
	Waste excavation (tonnes/cu.m)							
10)	State illegal mining/encroachments outside the lease boundary? Percentage of quantity mined out outside the lease boundary.							
11)	Method of working							
	I. Category type: (a) Mechanised (b) Semi – Mechanised (c) Manual							
	II. Construction and design of haul roads							
	a) Dimension as per the statutory requirements which were followed or otherwise							
	b) Number of vehicles plying on the main haul roads inside the mine and the approach road to the pit located outside the mine, if any.							
	c) Are any measures taken to minimise fugitive dust generated form mine haul roads? Does it comply with the CPCB/PCB Guidelines?							
	d) Is there a possibility that air pollutants emitted from the project area that do not comply with air quality standards as per CPCB/PCB?							
12)	Mechanized / Semi – Mechanized Method of Mining							
	(i) Number of loading / excavating equipments as per approved mining plan and capacity.							
	(ii) Number of loading / excavating equipments actually being deployed and capacity.							
	(iii) Type and number of transporting equipments.							
	(iv) Type of transporting system used – (a) trucks (b) Any other mode							
	(v) Capacity and Number of trucks used as per approved mining plan							
	(vi) Capacity and Number of trucks used actually in the mine.							

	(vii) Number and capacity of loading equipments and trucks used not in line with approved mining plan.	

	Capacity (m^3)	Numbers
Excavator		
Trucks		

	(viii) Impact of excess deployment of loading equipments (excavators) and transporting equipments on environment. (a) Air pollutants (b) Water Quality (c) Land Quality (d) Noise level	
	(ix) Does the deployment of loading equipments (excavators) and trucks fulfil the statutory requirements as per MMR 1961, with respect to the site conditions?	
13)	Method of Rock Breaking/Material preparation for the excavation:	
	(i) Methodology adopted –	
	a) Drilling and blasting	
	b) Rock breakers	
	c) Rippers	
	d) Surface miners	
	e) Direct mucking by excavators	
	f) Manual means	
	g) Any other methods or combination of above	
	(ii) In case of drilling and blasting method:	
	(a) Type of blasting: short hole or deep hole	
	(b) Whether controlled blasting technique adopted? If yes, specify the technique with details of study, year of study	
	(c) Impacts due to blasting defined as per the studies, if any carried out previously as indicated	
	(d) Dust pollution	
	(e) Noise level (dB(A))	
	(f) Ground vibration studies and Fly rock projection	
	(iii) Impact of preparation of Ore and waste on environment-	
	a) Air Pollution	

	b) Noise Pollution	
	c) Water Pollution	
	d) Safety standards	
	e) Traffic density	
	f) Road Condition (vulnerability)	
14)	Construction and Design of Dumps.	
	a) Place/Location	
	b) Approach to Dump form the mine distance and safety standards.	
	c) Area of extent occupied	
	d) Dimension of Dump and No. of terrace with heights (benches)	
	e) Vegetation covered ; If yes, specify the details of plants	
15)	Construction and Design of Waste Dumps	
	(i) Numbers and Location of Dumps as per approved Mining Plan	
	(ii) Specify whether reject dumps are located within or outside mining lease	
	(iii) Area occupied in excess of the approval mining plan.	
	(iv) Dimension of Terracing, Light, shapes, etc., Dump as per approved Mining Plan	
	(v) Fresh/Existing Dimension Height, shape, width. etc., of Dumps in the mine.	
	(vi) Volume/Quantity added to Waste/Dump during the violated period.	
	(vii) Approach to the Dump-Dimension, distance.	
	(viii) Number of and type of equipments deployed in Dump.	
	(ix) Provision of Garland drains around the Dumps.	
	(x) Any vegetation made on the slopes.	
	(xi) Provision of safety standards.	
	(xii) Impact of Waste/Dumps on environment.	
	a) Air pollution	
	b) Water pollution	
	c) Dust pollution	
	d) Noise pollution	
	(xiii) Terracing	
16)	Construction and Design of Ore and sub grade ore/mineral Stacks:-	
	(i) Number and Location of Ore stacks.	
	(ii) Dimension of Ore/sub grade Stacks as per the Approved Mining Plan	
	(iii) Volume/Quantity added during the violation period.	

	(iv) Any Screening plant or any other loading equipment engaged during the violated period.	
	(v) Approach to Ore / sub grade stack –Distance, hazards.	
	(vi) Safety standards adopted while operation.	
	(vii) Impact of ore/sub grade on environment	
	a. Air pollution	
	b. Water pollution	
	c. Dust pollution	
	d. Noise pollution	
17)	Mine Pit Water	
	(i) Intersection of Ground water table, specify the measures taken.	
	(ii) Ground water table as per hydro geological Studies (Pumping test).	
	(iii) Provision of Garland drains around pit and dumps	
	(iv) Water pollution	
	(v) Management of mine water.	
	(vi) Ultimate pit limit, w.r.t Ground water intersection and management of drainage of ground water.	
18)	Diversion of General Drainage/River/Nallah course for mining	
19)	Clearing of vegetation before the commencement of mining operation- Number of trees (species wise)	
20)	Man Power	
	(a) Statutory management	
	(b) Regular (Non –statutory) Manpower	
21)	Occupational Health and Safety.	
	(a) Periodical monitoring of health standards of persons employed as per Mine Act, 1952.	
	(b) Failure to inform statutory bodies periodically, if any	
22)	Population (Nearby Habitation)	

	(i) Population/Significant Population/Dense Population within the buffer zone of 10 Kms.	
	(ii) People displacement due to mining activities	
	(iii) Location/ Existence of habitation near the river or any other historical/sensitive/ forest distance.	
	(iv) Impact of mining on Surrounding and habitation-Air, Water, Noise, Pollution.	
	(v) Socio Economic aspects of mining.	
23)	CSR	
	(a) Field ground Activities or studies. Actual amount spent towards CSR and the future proposal.	
24)	NOC from DMG for quantity clarification in respect of settlement of all the amount payable against identified violation.	
25)	For the Clearance of EC, Public Hearing is mandated as per MoEF & CC Notification.	
26)	Conceptual post mining land use/restoration	
27)	Litigation/court cases, if any pending	
28)	Disaster management plan for the mine	

TAMIN

TAMIL NADU MINERLAS LTD, CHENNAI – 600 005

Rc No.3446/ML3/2015 **Dated: 16.07.2024**

To
The Member Secretary
State Environmental Impact Assessment Authority (SEIAA)
Panagal Maaligal, No.1, Jeenis road,
Saidapet, Chennai – 600 015.

Sir,

Sub: TAMIN-Mining Lease – Jakkery Colour Granite quarry over an extent of 27.04.50ha in Sf.Nos.486(P) & 736/4 of Jakkery Village, Denkanikottai Taluk, Krishnagiri District –seeking ToR (violation)–requested- regarding.

Ref: 1. Govt. Letter No Letter No.5883890/MME.2/2023-1, Natural Resources Department, dated.14.02.2024
2. The Commissioner of Geology & Mining, Chennai Letter. Rc.No.8664/MM4/2019,dt.22.05.2024

***

GoTN issued the precise area communication letter to TAMIN for quarrying Colour Granite over an extent of 27.04.50Ha of Govt. poramboke land in SF Nos.486(P) & 736/4 of Jakkery Village, Denkanikottai Taluk, Krishnagiri District for a period of 20 years under Rules 8-C of Tamil Nadu Minor Mineral Concession Rules (TNMMCR),1959 vide reference 1st cited.

2. Accordingly, the mining plan was submitted within the stipulated time and the same was approved by the Commissioner of Geology & Mining, Chennai vide reference 2nd cited.

3. In order to obtain the Terms of Reference (ToR), the Pre- Feasibility Report (PFR) Form-1 and Form-1 M for the subject area under violation category has been prepared as per the Guidelines of MoEF & CC Circular No J-11013/41/2006-A.II(I), dated.30.12.2010 and uploaded the same in PARIVESH 2.0 Login for kind perusal and record.

4. Further, it is submitted that one time processing fee **Rs.3,50,000/-** (Rupees Three lakh and fifty thousand only) by means of Demand Draft in favour of *the Member Secretary, SEIAA*, payable at *Chennai* as per G.O (Ms) 13 Environment, Climate Change and Forest (EC.3) Department, dt.18.01.2024 will be submitted at the time of submission of hard copy of the application Form-1, Form-1 M and PFR connected records.

5. Hence, we request the Member Secretary, SEIAA to consider the above and arrange to place the proposal in the forthcoming SEAC Meeting to recommend to grant ToR.

Yours faithfully,
for **Tamil Nadu Minerals Ltd,**

16.07.2024

Deputy Manager (ML)
Authorized signatory

Annexure No : I

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Natural Resources
(MME.1) Department
Secretariat, Chennai – 600 009

Letter No.5883890/MME.2/2023-1, Dated: 14.02.2024

From
Thiru K. Phanindra Reddy, IAS.,
Additional Chief Secretary to Government (FAC)

To
Tvl.Tamil Nadu Minerals Limited,
No.31, Kamarajar Salai,
TWAD House,
Chepauk, Chennai – 600 005.

Sir,

Sub: Natural Resources – Minor Mineral – Colour Granite - Quarry lease application preferred by Tvl.TAMIN for quarrying of Colour Granite over an extent of 27.04.5 hectares of Government Poramboke land in S.F.Nos.486 (P) and 736/4 of Jakkery Village, Denkanikottai Taluk, Krishnagiri District -Precise area communicated - Approved Mining Plan and Environmental Clearance – Called for.

Ref:
1. Your Quarry Lease Application dated 21.04.2018.
2. From the District Collector, Krishnagiri, Note File.No.829/2018-(Mines), Dated 16.08.2023.
3. From the Director of Geology and Mining, Chennai, File Rc.No.8664 /MM4/ 2019, Dated 26.09.2023.

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I am directed to invite attention to the references second and third cited, wherein the District Collector, Krishnagiri and the Director of Geology and Mining, Chennai have recommended and forwarded your quarry lease application for grant of quarry lease for quarrying of Colour Granite over an extent of 27.04.5 hectares of Government Poramboke land in S.F.Nos.486 (P) and 736/4 of Jakkery Village, Denkanikottai Taluk, Krishnagiri District for a period of 20 years under rule 8-C of the Tamil Nadu Minor Mineral Concession Rules, 1959.

2. The Government carefully examined the recommendations of the District Collector, Krishnagiri and the Director of Geology and Mining, to communicate precise area for an extent of 27.04.5 hectares of Government Poramboke land in S.F.Nos.486 (P) and 736/4 of Jakkery Village, Denkanikottai Taluk, Krishnagiri District and accordingly, the Government hereby communicate Precise Area for the above said area under sub-rule (3) (b) of Rule 8-C of the Tamil Nadu Minor Mineral Concession Rules, 1959 for grant of quarry lease.

3. I therefore request you to furnish the Approved Mining Plan for the above-mentioned Precise Area through the Commissioner of Geology and Mining within a period of 3 months as per sub-rule (3) (b) of rule 8-C of the TNMMCR, 1959 and to produce Environmental Clearance obtained from the competent authority for the above said area for grant of quarry lease subject to the following conditions to the Government:-

1. A safety distance of 50mts to be provided to the Karudakambam (Lighting pillar) in S.F.486(P).
2. A safety distance of 50mts to be provided to the Nagalingeswara temple and house in the Eastern boundary of S.F.486(P).
3. A safety distance of 50mts to be provided to the EB line and Road on the northern applied area in S.F.486(P).
4. A safety distance of 50mts to be provided to the EB line and houses on the East of S.F.736/4.
5. A Safety distance 7.5 mtrs is to be provided to the adjacent patta lands on North of S.F.No.736/4.
6. Before execution of lease Tvl.TAMIN, has to submit mining due clearance for those lease hold areas of all the district of Tamil Nadu.
7. The quarrying operation should be restricted only in the area granted on lease.
8. Barbed wire fencing or Compound wall should be erected all along the boundary of the lease granted area.
9. The waste materials generated during the course of quarrying should be dumped only within the lease hold area.
10. Environment Clearance should be obtained from the competent authority in respect of the subject area as per rule 42 of TNMMCR, 1959 and as per the notification of the Ministry of Environment and Forest and any other clearances if any.
11. As per rule 12 (V) of Mineral (other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016, the applicant firm shall at his own expenses erect, maintain and keep in repair all the boundary pillars.
12. A green belt should be constructed by planting trees along the boundary of the area to control air and noise pollution.
13. As per the Hon'ble Supreme Court of India order dated 08.01.2020 in W.P.(C).No.144/2014, after Ceasing quarry operation re-grassing the quarry area and any other area which may have been disturbed due to the quarrying activity and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.
14. The quarrying operation should be carried out between 7.00 A.M. to 5.00 P.M.
15. Green belt should be created all along the boundary of the lease granted area by planting 1000 or above taller seedlings of tree species.

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16. They may be requested to contribute CSR Fund for creating fence along the Reserved Forests boundary.
17. Vehicles carrying Mining materials should not utilize Forest road meant for Forestry purposes.
18. The Vehicles carrying Mining materials shall make available for checking whenever a Forest Officer intends to check to ascertain the Genuineness of the proceeds and quarry.
19. The conditions imposed by the Wildlife Warden and Conservator of Forests Dharmapuri should be complied with.
20. Latest Mining due clearance certificate should be produced before the execution of lease deed.
21. The four boundaries of the applied area are fixed and the quarrying activity should be restricted within the area granted on lease.
22. The applicant company should fence the lease granted area with barbed wire before the execution of lease deed as follows:-
    - ❖ The pillar post shall be firmly grounded with concrete foundation of height not less than 2 meters with a distance between two pillars shall not be more than 3 meters.
    - ❖ The applicant company shall incorporate the DGPS readings for the entire boundary Pillars of the area and the same should be clearly shown in the mining plan.
    - ❖ A soft copy of the digitized map with DGPS readings should be submitted in the CD to the Deputy Director (G&M), Krishnagiri.
23. The conditions mentioned in G.O No.79, Industries Department, dated 06.04.2015 should be complied with.
24. The applicant company should comply with the additional conditions stipulated in the Government of India, Ministry of Mines order No.11/02/2020, dated 14.01.2020 issued as per the orders of Hon'ble supreme Court of India dated 08.01.2020 which states that "The mining lease holders shall after ceasing mining operations, under take re-grassing the mining area and any other area which may have been disturbed due to this mining activities and restore the land to a condition which is fit for growth of fodder, flora and fauna etc.,"
25. The applicant company should carry out DGPS survey and erection of RCC boundary pillars as per the norms stipulated in the EOI notification in Rc.No.2921/ MM4/ 2019, dated 01.02.2018 and subsequent corrigendum, dated 13.08.2019.
26. The applicant company shall strictly adhere to the statutory and safety requirements.
27. Quarrying shall be done as per the approved Mining Plan and that the mining plan is approved without prejudice to any other law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any authorities.

28. The applicant company shall submit scheme of mining; mine closure plan and other statutory requirements within the time stipulated for submission of the above, as per rules.

29. If any violation is found during quarrying operation, the penal provisions of the Tamil Nadu Minor Mineral Concession Rules, 1959 and other rules and act in force will attract.

4. The District Collector, Krishnagiri shall obtain a sworn-in-affidavit from the applicant / firm, containing the above conditions before execution of lease deed and also ensure that the instructions issued in Government Letter No.12789/MMB.2/2002-7, Industries Department, dated 09.01.2003 are complied with. Further, the District Administration / Geology and Mining Department should ensure the conditions imposed in G.O. (Ms) No.79, Industries (MMC.1) Department, dated 06.04.2015.

Yours faithfully,

P. Shanmugandhan
14/2/24

for Additional Chief Secretary to Government

Copy to:
The Commissioner of Geology and Mining, Chennai-32
The District Collector, Krishnagiri.

MINING PLAN FOR
JAKKERY COLOUR GRANITE QUARRY

District	:	**Krishnagiri**
Taluk	:	**Denkanikottai**
Village	:	**Jakkery**
Field No.	:	**486(Part)&736/4**
Classification	:	**Govt. Poramboke**
Extent	:	**27.04.5Ha.**

(UNDER RULE 12, 13 & 16 OF GCDR, 1999)

APPLICANT:

TAMIN

M/s. TAMIL NADU MINERALS LIMITED,
(An Undertaking of Government of Tamil Nadu)
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI – 600 005.

Name of the RQP	:	**Dr. E.GANESAN, Ph.D., PGDELP.**
Designation	:	**DEPUTY MANAGER, TAMIN**
Mobile No	:	**94888 55535**

LIST OF CONTENTS

LIST OF PLATES

LIST OF ANNEXURES

DECLARATION BY NOMINATED OWNER

Certified that the Mining Plan in respect of Jakkery Colour Granite Quarry over an extent of 27.04.5Ha in SF.No.486 (Part) and 736/4 of Jakkery Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu State has been prepared in full consultation with me and I understood its contents and agree to implement the same in accordance with the law. The Mining Plan has been prepared by Dr.E.Ganesan, a Recognized Qualified Person.

I hereby undertake that all the modifications as made in the Mining Plan by the RQP are deemed to have been made with my knowledge and consent and shall be acceptable to me and binding on me in all respects.

I request you to make further correspondences regarding the modifications of the Mining Plan with the said Recognized Qualified Person in the following address:

Dr.E.Ganesan, Ph.D., PGDELP.,
Deputy Manager (Mining Lease),
Recognized Qualified Person
Tamil Nadu Minerals Limited,
No.31, Kamarajar Salai,
Chepauk, Chennai-600 005.

ANIL MESHRAM, I A S.,
MANAGING DIRECTOR

6/6

CERTIFICATE FROM THE RECOGNIZED QUALIFIED PERSON

This is to certify that the provisions of Granite Conservation and Development Rules, 1999 and as amended in Tamil Nadu Minor Mineral Concession Rules, 1959 have been observed in the preparation of Mining Plan for Jakkery Colour Granite Quarry over an extent of 27.04.5Ha of Jakkery Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu State has been prepared for

M/S. Tamil Nadu Minerals Limited,
No.31, Kamarajar Salai,
Chepauk, Chennai- 600 005.

Wherever specific permissions, exemptions, relaxations and approvals are required, the applicant will approach concerned authorities of Department of Geology and Mining, Guindy, Chennai for such permissions/exemptions/relaxations and approvals.

It is also certified that information furnished in the above Mining Plan are true and correct to the best of my knowledge.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

Place: Chennai
Date:

1.0. INTRODUCTION:

M/s Tamil Nadu Minerals Limited (An Undertaking of Government of Tamil Nadu hereinafter referred as TAMIN) was established in the year 1978 to carryout systematic mining and development of different minerals all over the State.

The Present mining plan has been prepared for quarrying Colour Granite (Pink Migmatite) over an extent of 27.04.5Ha in SF.No.486 (Part) & 736/4 of Jakkery Village, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu State for 20 years for which Precise area communication has been granted vide Government Natural Resources (MME.2) Department, Letter No.5883890/MME.2/2023-1,Dated 14.02.2024.

Meanwhile, the Government of Tamil Nadu has introduced the Rule 8-C(11) of the Tamil Nadu Minor Mineral Concession Rules,1959 and the Rules says that

> *"Granite waste may be sold as road metal or a raw material for production of manufactured sand or for any other purpose with the permission of the District Collector. The rate of seigniorage fee for granite waste shall be Rs.100/- (Rupees one hundred only) per tonne".*

Hence, TAMIN has proposed to produce and sell the Granite waste in accordance with the above Rule and Standard Operating Procedure (SoP) vide Government Letter No.6588Natural Resources (MME.1) 2022-6 Department, dated 13.12.2023.

Therefore, the Mining Plan has been Prepared with 25% recovery of Colour Granite and 75% recovery of Granite waste as per Rule 12, 13 & 16 of the Granite Conservation and Development Rules,1999 for the period of five years and submitted.

PART-I

1.0. MINING PLAN:

Name of Mine:

Jakkery (27.04.5Ha) Colour Granite Quarry

1.2 Particulars of Approval of Mining Plan under GCDR (indicate approval No. and date):

As the Mining Plan is prepared after obtaining the precise area communication letter from Govt. the question of particulars of approval of Mining Plan under GCDR (indicate approval No. and date) does not applicable at this stage.

1.3 Date of commencement of Mining Operations:

Will be intimated after execution of the lease deed under rule 8-C (5) (c) of the Tamil Nadu Minor Mineral Concession Rules,1959.

1.4 (a) Deficiencies, if any that existed in the approved Mining Plan to be taken note of and rectified by incorporating suitable proposal for implementation in the Scheme of Mining:

Not applicable at this stage as it is a fresh lease.

1.4(b) Review of Compliance of salient features of Mining Plan on chapter-wise basis bringing out marked deviations, if any and justifications/ reasons thereof. Items to be covered may include exploration, mine development, exploitation, afforestation programme, reclamation and rehabilitation, control of dust, noise and ground vibration and any other significant feature:

(1) Exploration:

Systematic geological mapping and demarcation of the commercially viable granite deposit has been prepared with relevant structural features such as dip and strike of the country rock and the commercial granite deposit. Different joint patterns and their pattern of repetition etc., have been marked. Based on these features, estimation of geological reserves and mineable reserves has been arrived at considering the waste resources and market potentiality. Nevertheless to say, the mine has already been fully developed. By past mining, the probable depth of deposit, ratio of recovery with reference to ore to over burden have been established earlier and hence no exploration programme is envisaged during the next five years period of mining.

(2) Mine Development:

Sl No.	Year pertaining to	Proposed generation of waste in the Mining Plan Period (M^3)	
		Over Burden	Side Burden
1.	First	1823	--
2.	Second	--	--
3.	Third	4076	--
4.	Fourth	3825	--
5.	Fifth	4158	--
Total		**13882**	**Nil**

(3) Exploitation:

Year	Run of Mines in		Saleable Colour Granite Recovery @25%		Saleable Colour Granite Waste Recovery @75%	
	M^3	Tonnes	M^3	Tonnes	M^3	Tonnes
First	6001	15903	1500	3975	4501	11928
Second	7202	19085	1800	4770	5402	14315
Third	8800	23320	2200	5830	6600	17490
Fourth	9601	25443	2400	6360	7201	19083
Fifth	10000	26500	2500	6625	7500	19875
Total	**41604**	**110251**	**10400**	**27560**	**31204**	**82691**

Note: Specific Gravity of Colour Granite: 2.65

(4) Progressive quarry closure Plan:

As a Petrogenetic character, the depth persistence of the Colour granite body in the mine area is beyond the workable limits. However, it is very difficult to operate granite dimensional stone mine economically below an average depth of 30m by observing the statutory provisions of Mine Safety Rules and Regulations. Hence, in the proposed Mining Plan, only 30m average depth has been envisaged as 'Workable depth' for safe and economic mining.

However, it is proposed not to back fill the ultimate pit, in as much as good quantity of reserves is available below the workable depth of 30m and there is possibility of technology of up gradation in granite mining for greater depths in course of time for safe mining at economic cost beyond 30m depth. The pit boundaries shall be safely fenced and used for agricultural purpose when the pit is filled with underground see page or rain waters.

(5) Control of Dust, Noise and Ground Vibrations:

The quarrying operation is being carried out by semi-mechanized method with deployment of HEMM for development and production activities. Dust will be suppressed by adopting wet drilling method and water sprinkling in the haul road. As expansion rock breaking powder is using for splitting rock the noise level will be reduced. As TAMIN is using Milli Second Delay Detonator (MSDD) for blasting, the vibration observed in this quarry is negligible.

Ground Water:

Ground water occurrence in this area is below 8.7m below ground level due to scanty rainfall and semi-arid climate. The quarry operation confined to well above the water table for the entire lease period; hence the quarry operation will not be affected by the ground water in any manner.

Significant Features:

TAMIN closely monitored the environmental factors systematically without degrading the land, water and air.

1.4(c) Review of the compliance position of conditions and stipulations imposed, if any, while approving the Mining Plan. In case of non-compliance / partial compliance, detailed justification reasons thereof may be furnished along with proposal for compliance in the ensuing period:

The Mining Plan for the subject area under reference was approved earlier by observing the provisions of GCDR 1999 and the Rules framed there under. TAMIN always carries out its mining operations in conformity with the above Acts and Rules.

1.4 (d) Review of compliance of violations pointed out after inspections made under GCDR, 1999 during last 5 years. The position emerging out of the yearly review of the Mining Plan while checking up implementation of the Mining Plans in the field shall also be taken note of at this stage:

No violation has been pointed out after instruction made under GCDR, 1999.

1.4 (e) Any other points requiring attention in the interest of proper mine design, development and conservation and environment and ecology of the area:

The present as well as the proposed mine working is so designed in such a way mainly keeping in view of conservation of mineral, afforestation, environment, and ecology of the mine area.

***

PART – II

2.0.PROPOSAL UNDER MODIFIED MINING PLAN FOR THE NEXT 2 YEARS.

2.1 Name and Address of the Lessee:

Name	:	M/s.Tamilnadu Minerals Limited,
Address	:	No. 31, Kamarajar Salai, Chepauk, Chennai - 600 005. Tamil Nadu State.
Phone	:	044-2989 2018
e.Mail	:	tamin@tamingranites.com

2.2 Name and address, registration number of the recognized persons together with validity date / person employed under Rule 13 of GCDR1999 who has prepared the Mining Plan:

RQP Certificate Enclosed.

2.3 Mineral (s) to be mined:

To mine the Pink Migmatite commercially known as 'Red Wave' Colour Granite Dimensional Stone' and Granite waste.

2.4 Area and date of expiry of lease:

Details of Lease Applied Area	Date of expiry of lease
Jakkery Colour Granite quarry, Extent – 27.04.5Ha of Jakkery Village, SF.No. 486(Part) and 736/4, Denkanikottai Taluk, Krishnagiri District, Tamil Nadu State.	Will be informed after execution of lease deed

2.5 Date of expiry of 5 year period for which Mining Plan approved on the last occasion:

Not applicable at this stage.

3.0. RESERVES:

3.1 Category-wise (Proved, Probable and Possible) Reserves Estimated in the earlier Mining Plan with grades:

Sl. No	Geological Reserves	Mineable Reserves	Mineable Saleable Granite Reserves @25% Recovery	Mineable Saleable Granite Waste Reserves @75% Recovery
1.	37,00,465M^3	29,53,169M^3	7,38,292M^3	22,14,877M^3

The above estimations arrived at on the basis of geological cross sections.

3.2 Depletion of Reserves:

Nil. At this Mining Plan state.

3.3 Additional reserves established category wise (with basis and parameters considered):

No additional reserves.

3.4 Category wise updated reserve with grade (indicate and use grade with analysis) as well as marginal grades:

Sl. No	Geological Reserves	Mineable Reserves	Mineable Saleable Granite Reserves @25% Recovery	Mineable Saleable Granite Waste Reserves @ 75% Recovery
1.	37,00,465M^3	29,53,169M^3	7,38,292M^3	22,14,877M^3

The above estimations arrived at on the basis of geological cross sections updated as on 22.03.2024.

4.0. CONCEPTUAL MINING PLAN:

a) Anticipated Life of the Quarry:

Updated Mineable Reserves : 29,53,169M^3
Anticipated Life of the Quarry : 295.3 @ 296 years.

s

b. Depicted on Mine Geological Plans and sections with necessary statement annexed supported by essential text, covering the basic & long term design features of mine covering exploration, mine development, optimum exploitation & utilization of the mineral, waste & sub-grade mineral management, and environmental aspects. The ensuing five year detailed programme should but be a part of the conceptual overall Mining Plan.

i. Mine Year wise Production:

Year	Run of Mines in		Saleable Colour Granite Recovery @25%		Saleable Colour Granite Waste Recovery @75%	
	M^3	Tonnes	M^3	Tonnes	M^3	Tonnes
First	6001	15903	1500	3975	4501	11928
Second	7202	19085	1800	4770	5402	14315
Third	8800	23320	2200	5830	6600	17490
Fourth	9601	25443	2400	6360	7201	19083
Fifth	10000	26500	2500	6625	7500	19875
Total	**41604**	**110251**	**10400**	**27560**	**31204**	**82691**

Mine Year wise Development:

Sl No.	Year pertaining to	Proposed generation of waste in the Mining Plan Period (M^3)	
		Over Burden	Side Burden
1.	First	1823	--
2.	Second	--	--
3.	Third	4076	--
4.	Fourth	3825	--
5.	Fifth	4158	--
Total		**13882**	**Nil**

ii) Optimum exploitation and utilization of the Mineral:

The optimum quantity of mineable reserves as ROM is 29,53,169M^3.

iii) Waste and sub-grade Mineral Management:

The dumps will be maintained not exceeding 5m height and the angle of slope of dumps will be at 45^0 from horizontal. The waste dump has been earmarked in the Plate No. 4.

iv) Environmental Aspects:-

Afforestation Programme:

TAMIN will get environment clearance (EC) from the SEIAA as directed by the Govt. after approval of this mining plan and necessary native species of sapling will be planted as per the EC letter.

The quarrying operation is being carried out by semi-mechanized method with deployment of HEMM for development and production activities.

Ultimate Pit dimensions of the Quarry at top and bottom are tabulated below:

Sl. No.	Ultimate Pit Dimensions at Top (m)		Ultimate Pit Dimensions at Bottom (m)		Depth	Pit SF.No
	Length	Width	Length	Width		
1.	581.50	172	557.50	147	30	486(Part)
2.	149	229	125	205	30	736/4

5.0 MINING:

5.1 Salient Description of the present mining methods:

The Quarrying work being carried out under the direct supervision of our Statutory Mining Personal of TAMIN as approved by the DGMS under MMR,1961.

5.2 Yearly pit-wise development plan proposed for the next five years, depicted on plans and sections (ore and overburden to be shown clearly along with geological formations encountered depicting also the design and layout of the mine benches in case of opencast mining).

It has been discussed in chapter 4.0 b i)

5.3 Yearly pit-wise development plan proposed for next five years along with grade. Blending proposal, if any, may be indicated:

Nil

Details of depth and benches proposed during the Mining Plan Period :

Year	Section	R.L Proposed (m)	Depth Details(m)				No. of Benches
			Present	Proposed	Remaining	Total	
First	P'Q'&AB	790.713to783.113	0	7.60	22.40	30.0	1
Second	R'S'&AB	781.396to776.996	7.25	4.40	18.35	30.0	1
Third	X'Y'&CD	822.000to805.700	0	16.30	13.70	30.0	2
Fourth	X'Y'&EF	830.000to809.700	0	20.30	9.70	30.0	3
Fifth	X'Y'&GH	833.500to815.660	0	17.90	12.10	30.0	3

5.4 Any change in proposed method of mining and deployment of machinery, together with reasons thereof:

There is no change in the method of mining.

6.0. HANDLING OF WASTE /SUB- GRADE MATERIAL:

6.1 Rate of yearly generation of waste and proposals for disposal of waste for next five years. (indicate sequence of dumping with necessary plan and sections)

The waste generated during the mining operation i.e., over burden, un-sized boulders and rubbles etc, will be dumped in the suitable area already selected. The area for disposal of over burden has been identified on Western Side of the SF.No.486 (Part) of lease applied area. The unsold blocks are kept within the boundary on the country rock area.

6.1.1 Build-up of dumps from year to year to be shown in yearly plans and sections with description of the method & manner of disposal of waste rock, designed capacity & height of individual dumps and precautions envisaged for confinement of the dumps together with design details of the protective works:

The dumps will be maintained not exceeding 5m height and the angle of slope of dumps will be at 45^0 from horizontal. The waste dump has been earmarked in the Plate Nos. 4.

6.2 Rate of yearly generation of sub-grade mineral with reference to threshold values and proposals for stacking for next five years. (Submit necessary plan/sections.) (In case variations from the recommended threshold values of IBM, please give adequate justification and reasons).

There is no sub-grade mineral produced. Commercial and small blocks are also proposed to be sold while handling granite waste.

6.3 Quantity and grade of sub-grade material available at the mine as on date duly supported by plans & sections and descriptive statement inclusive of the precautions adopted for storage.

-Not Applicable-

7.0. USE OF MINERAL:

7.1 Changes proposed in the use of mineral, if any, with reasons:

TAMIN will sell dimensional blocks and granite waste in accordance with Rule 8-C (11) of the Tamil Nadu Minor Mineral Concession Rules,1959.

7.2 Changes in the specification, if any, imposed by the user industries and or specifications required in the case of new user industries, if any, to be given:

As mentioned above there is no change in specification imposed by the user industries.

7.3 Efforts made for utilization of the sub-grade mineral including fines:

Commercial blocks and small blocks will also be sold in addition to defect free blocks.

8.0. MINERAL BENEFICIATION:

8.1 Results of any beneficiation investigations conducted and changes made in existing mineral beneficiation plant and tailing disposals, if any, with benefits expected (necessary) flow - sheet and tailing dam designs etc., to be submitted as applicable:

- Not Applicable –

8.2 Beneficiation test done, if any, on sub-grade mineral including fines and proposals for installation of new or additional beneficiation facility, if any (furnish process details in brief along with expected tailings loss):

- Not Applicable –

9.0. ENVIRONMENTAL MANAGEMENT PLAN:

The following observations are made for Environmental Management Plan:

i) Existing land use pattern:

The lease applied area is hillock covered entirely with rocky terrain. The area is moderate Rainfall and hence there is sparse growth of vegetation within lease area. However, efforts will be taken to plant trees. The altitude of the area is 910.4556m (Maximum) above MSL and the area receives average annual rainfall of about 985mm.

Land Reclamation & Rehabilitation:-

The mine-pit will be fenced so as to avoid the inadvertent entry and mine pit water will be utilized as a water reservoir.

Waste Dump management:-

The waste material can be dumped on Western side of SF.No 486 (Part) of the lease applied boundary.

10.0. ANY OTHER INFORMATION:

- NIL -

Date:

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

COMMISSIONER
GEOLOGY AND MINING
GUINDY, CHENNAI - 600 032.

This Mining Plan is Approved Subject to the Conditions / Stipulation Indicated in the Mining Plan Approval

Letter No. 864/mm4/2019 Dated 22-05-2019

Annexure No : I

503

Natural Resources
(MME.1) Department
Secretariat, Chennai – 600 009

Letter No.5883890/MME.2/2023-1, Dated: 14.02.2024

From
Thiru K. Phanindra Reddy, IAS.,
Additional Chief Secretary to Government (FAC)

To
Tvl.Tamil Nadu Minerals Limited,
No.31, Kamarajar Salai,
TWAD House,
Chepauk, Chennai – 600 005.

Sir,

Sub: Natural Resources – Minor Mineral – Colour Granite - Quarry lease application preferred by Tvl.TAMIN for quarrying of Colour Granite over an extent of 27.04.5 hectares of Government Poramboke land in S.F.Nos.486 (P) and 736/4 of Jakkery Village, Denkanikottai Taluk, Krishnagiri District -Precise area communicated - Approved Mining Plan and Environmental Clearance – Called for.

Ref:
1. Your Quarry Lease Application dated 21.04.2018.
2. From the District Collector, Krishnagiri, Note File.No.829/2018-(Mines), Dated 16.08.2023.
3. From the Director of Geology and Mining, Chennai, File Rc.No.8664 /MM4/ 2019, Dated 26.09.2023.

****

I am directed to invite attention to the references second and third cited, wherein the District Collector, Krishnagiri and the Director of Geology and Mining, Chennai have recommended and forwarded your quarry lease application for grant of quarry lease for quarrying of Colour Granite over an extent of 27.04.5 hectares of Government Poramboke land in S.F.Nos.486 (P) and 736/4 of Jakkery Village, Denkanikottai Taluk, Krishnagiri District for a period of 20 years under rule 8-C of the Tamil Nadu Minor Mineral Concession Rules, 1959.

2. The Government carefully examined the recommendations of the District Collector, Krishnagiri and the Director of Geology and Mining, to communicate precise area for an extent of 27.04.5 hectares of Government Poramboke land in S.F.Nos.486 (P) and 736/4 of Jakkery Village, Denkanikottai Taluk, Krishnagiri District and accordingly, the Government hereby communicate Precise Area for the above said area under sub-rule (3) (b) of Rule 8-C of the Tamil Nadu Minor Mineral Concession Rules, 1959 for grant of quarry lease.

3. I therefore request you to furnish the Approved Mining Plan for the above-mentioned Precise Area through the Commissioner of Geology and Mining within a period of 3 months as per sub-rule (3) (b) of rule 8-C of the TNMMCR, 1959 and to produce Environmental Clearance obtained from the competent authority for the above said area for grant of quarry lease subject to the following conditions to the Government:-

1. A safety distance of 50mts to be provided to the Karudakambam (Lighting pillar) in S.F.486(P).
2. A safety distance of 50mts to be provided to the Nagalingeswara temple and house in the Eastern boundary of S.F.486(P).
3. A safety distance of 50mts to be provided to the EB line and Road on the northern applied area in S.F.486(P).
4. A safety distance of 50mts to be provided to the EB line and houses on the East of S.F.736/4.
5. A Safety distance 7.5 mtrs is to be provided to the adjacent patta lands on North of S.F.No.736/4.
6. Before execution of lease Tvl.TAMIN, has to submit mining due clearance for those lease hold areas of all the district of Tamil Nadu.
7. The quarrying operation should be restricted only in the area granted on lease.
8. Barbed wire fencing or Compound wall should be erected all along the boundary of the lease granted area.
9. The waste materials generated during the course of quarrying should be dumped only within the lease hold area.
10. Environment Clearance should be obtained from the competent authority in respect of the subject area as per rule 42 of TNMMCR, 1959 and as per the notification of the Ministry of Environment and Forest and any other clearances if any.
11. As per rule 12 (V) of Mineral (other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016, the applicant firm shall at his own expenses erect, maintain and keep in repair all the boundary pillars.
12. A green belt should be constructed by planting trees along the boundary of the area to control air and noise pollution.
13. As per the Hon'ble Supreme Court of India order dated 08.01.2020 in W.P.(C).No.144/2014, after Ceasing quarry operation re-grassing the quarry area and any other area which may have been disturbed due to the quarrying activity and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.
14. The quarrying operation should be carried out between 7.00 A.M. to 5.00 P.M.
15. Green belt should be created all along the boundary of the lease granted area by planting 1000 or above taller seedlings of tree species.

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16. They may be requested to contribute CSR Fund for creating fence along the Reserved Forests boundary.
17. Vehicles carrying Mining materials should not utilize Forest road meant for Forestry purposes.
18. The Vehicles carrying Mining materials shall make available for checking whenever a Forest Officer intends to check to ascertain the Genuineness of the proceeds and quarry.
19. The conditions imposed by the Wildlife Warden and Conservator of Forests Dharmapuri should be complied with.
20. Latest Mining due clearance certificate should be produced before the execution of lease deed.
21. The four boundaries of the applied area are fixed and the quarrying activity should be restricted within the area granted on lease.
22. The applicant company should fence the lease granted area with barbed wire before the execution of lease deed as follows:-
    - ❖ The pillar post shall be firmly grounded with concrete foundation of height not less than 2 meters with a distance between two pillars shall not be more than 3 meters.
    - ❖ The applicant company shall incorporate the DGPS readings for the entire boundary Pillars of the area and the same should be clearly shown in the mining plan.
    - ❖ A soft copy of the digitized map with DGPS readings should be submitted in the CD to the Deputy Director (G&M), Krishnagiri.
23. The conditions mentioned in G.O No.79, Industries Department, dated 06.04.2015 should be complied with.
24. The applicant company should comply with the additional conditions stipulated in the Government of India, Ministry of Mines order No.11/02/2020, dated 14.01.2020 issued as per the orders of Hon'ble supreme Court of India dated 08.01.2020 which states that "The mining lease holders shall after ceasing mining operations, under take re-grassing the mining area and any other area which may have been disturbed due to this mining activities and restore the land to a condition which is fit for growth of fodder, flora and fauna etc.,"
25. The applicant company should carry out DGPS survey and erection of RCC boundary pillars as per the norms stipulated in the EOI notification in Rc.No.2921/ MM4/ 2019, dated 01.02.2018 and subsequent corrigendum, dated 13.08.2019.
26. The applicant company shall strictly adhere to the statutory and safety requirements.
27. Quarrying shall be done as per the approved Mining Plan and that the mining plan is approved without prejudice to any other law applicable to the quarry lease from time to time whether such laws are made by the Central Government, State Government or any authorities.

28. The applicant company shall submit scheme of mining; mine closure plan and other statutory requirements within the time stipulated for submission of the above, as per rules.

29. If any violation is found during quarrying operation, the penal provisions of the Tamil Nadu Minor Mineral Concession Rules, 1959 and other rules and act in force will attract.

4. The District Collector, Krishnagiri shall obtain a sworn-in-affidavit from the applicant / firm, containing the above conditions before execution of lease deed and also ensure that the instructions issued in Government Letter No.12789/MMB.2/2002-7, Industries Department, dated 09.01.2003 are complied with. Further, the District Administration / Geology and Mining Department should ensure the conditions imposed in G.O. (Ms) No.79, Industries (MMC.1) Department, dated 06.04.2015.

Yours faithfully,

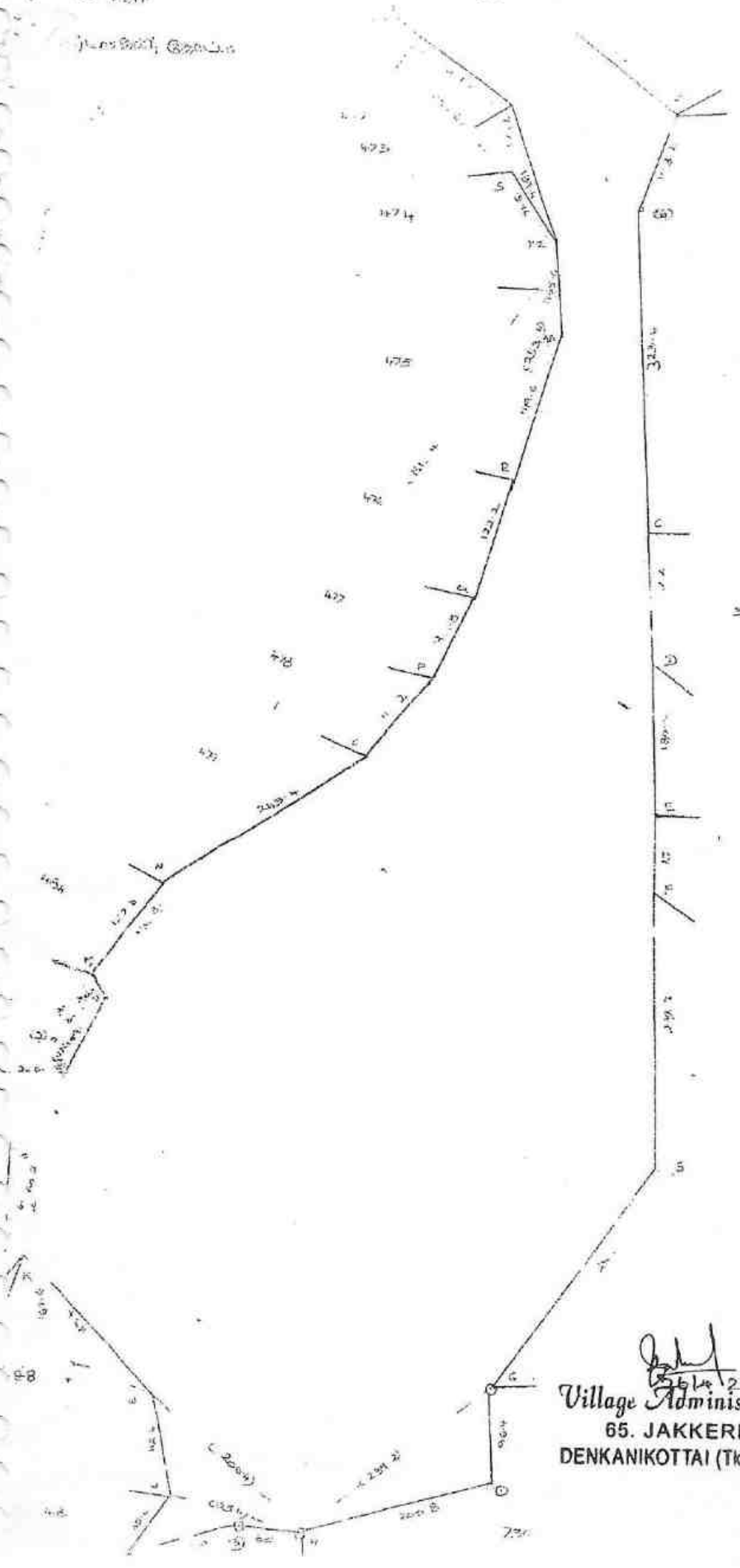
P. Shanmugandhan
14/2/24

for Additional Chief Secretary to Government

Copy to:
The Commissioner of Geology and Mining, Chennai-32
The District Collector, Krishnagiri.

409

Annexure No : 11



Village Administrative Officer
65. JAKKERI (Village),
DENKANIKOTTAI (Tk), Krishnagiri Dt

மாவட்டம். தருமபுரி

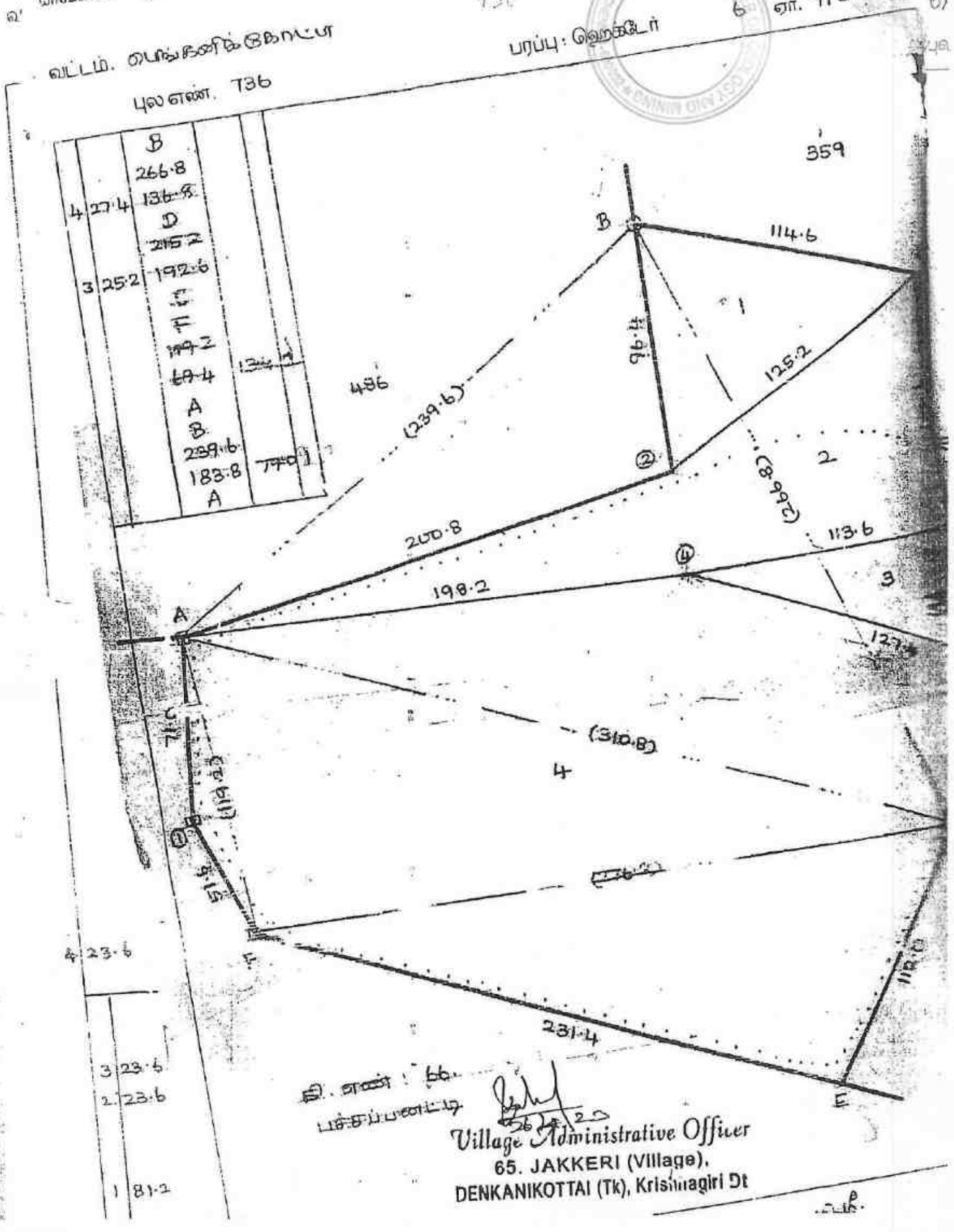
மாவட்டம். தருமபுரி

வட்டம். பெங்கனிக்கோட்டை

புல எண். 736

கிராமம் { எண். 65 — ஜக்கேரி
பெயர்

பரப்பு: ஹெக்டேர் 6 ஏர். 71.5



வி. எண் : 66.

பக்கப்பனட்டி

Village Administrative Officer
65. JAKKERI (Village),
DENKANIKOTTAI (Tk), Krishnagiri Dt

Annexure No : III இ. எண் 65. ஜெக்கேரி.

1	2	3	4	5	6	7	8	9	10	11
								சு. பை. தெ. ஏர்ஸ் சு. பை.		
358	.. 358	ர	ச	...	8-3	8	2 15	1 20·0	2 58	41 மா. ஆலப்பா.
359	1 359-1	ர	ச		8 5	12	0 62	0 37·5	0 23	6 ம. அல்லிபாஷா.
	2 -2	அ	ச	...	8-5	12	0 62	4 62·5	2 86	..
								5 00 0	3 09	
360	1A 360-1பா	ர	ச	..	8-3	8	2 15	0 46 5	1 00	533 தி. முனிசாமி.
	1B -1பா	ர	ச	..	8-3	8	2 15	0 69·5	1 49	927 நி. திம்மராயப்பா (1), நி. ராஜப்பா (2) நி. முனுசாமி (3).
	2A -2பா	ர	ச	..	8-3	8	2 15	0 69 5	1 50	927 நி. திம்மராயப்பா (1), நி. ராஜப்பா (2), நி. முனுசாமி (3).
	2B -2பா	ர	ச	...	8-3	8	2 15	0 09·0	0 19	41 மா. ஆலப்பா
								1 94 5	4 18	
	1A 361-1பா	ர	ச	..	8-3	8	2 15	0 08 0	0 17	533 தி. முனுசாமி.
	-1ஆ	ர	ச	..	8-3	8	2 15	0 04 0	0 09	927 நி. திம்மராயப்பா (1), நி. ராஜப்பா (2), நி. முனுசாமி (3).
	1C -1பா	ர	ச	...	8-3	8	2 15	0 30 0	0 64	664 தி. திருமலப்பா.
	1D -1பா	ர	ச	...	8-3	8	2 15	0 07 5	0 16	533 தி. முனுசாமி.
	1E -1பா	ர	ச	..	8-3	8	2 15	0 28 0	0 60	533 தி. முனுசாமி.
	2A -2பா	ர	ச	..	8-3	8	2 15	0 03·0	0 06	927 நி. திம்மராயப்பா (1), நி. ராஜப்பா (2), நி. முனுசாமி (3).
	2B -2பா		ச	...	8-3	8	2 15	0 88 5	1 94	41 மா. ஆலப்பா.
								1 69 0	3 66	
								2 57 5	...	... வாமி.
362	.. 362	அ	ஆ	...	...	..	...			
363	1 363-1			...	8-3	8	2 15	0 40·5	0 87	41 மா. ஆலப்பா.
	2 -2	ர		...	8-3	8	2 15	0 50·5	1 15	743 மு. வெங்கடசாமி.
								0 91·0	2 00	

Village Administrative Officer
65. JAKKERI (Village),
DENKANIKOTTAI (Tk), Krishnagiri Dt

2	3	4	5	6	7	8	9	10		12
						ஹே. ஏ.ப.	ஹே. ஏ.ச.	ரூ. பை.		
479-5	ர	பு	...	8-5	12	0 62	0 15·0	0 09	328 சி. நஞ்சுண்டப்பா	
-6	ர	பு	...	8-5	12	0 62	0 96·5	0 60	736 சி. வெங்கடசாமி.	
							1 88·5	1 17		
480	அ	புற	...			...	0 16·5		...	வழி.
481-பா	ர	ந (E)	...	8-3	14	6 79	0 29·0	2 00	517 சி. முனிசாமி.	
2 -பா	ர	ந (E)	...	8-3	14	6 79	0 18·0	1 19	328 சி. நஞ்சுண்டப்பா	
							0 47·0	3 19		
482	ர	ந (E)	...	8-3	14	6 79	0 08·0	0 55	328 சி. நஞ்சுண்டப்பா	
483	ர	ந (E)		8-3	14	6 79	0 27·0	1 88	395 சி. நியூ தப்பா.	
484	அ	புற	...	...	...		1 63·0			கோவில்.
485-பா	ர	பு	..	8-5	12	0 62	0 38·5	0 24	607 மு. ரங்கப்பா	
1 -பா	ர	பு	...	8-5	12	0 62	0 17·5	0 11	607 மு. ரங்கப்பா	
2 -பா	ர	பு	..	8-5	12	0 62	0 21·0	0 13	607 மு. ரங்கப்பா.	
4 -பா	ர	பு	..	8-5	12	0 62	0 02·5	0 06	1010 ரா. கிருஷ்ணப்பா (1), மு. ரங்கப்பா (2).	
-பா	ர	பு	...	8-5	12	0 62	0 08·5	0 05	607 மு. ரங்கப்பா	
							0 53·0			
486	அ	புற	...	...	...		25			கால்வாய்.
487-பா	ர	பு	...	8-5	12	0 62	0 63·5	41	389 மு. நாராயணப்பா.	வட்டக் கிணறு.
-பா	ர	பு	...	8-5	12	0 62	3 5		431 ரா. கிருஷ்ணப்பா (1), ரா. ரங்கப்பா (2), ரா. முனி வெங்கடேசன் (3).	வட்டக் கிணறு.
-பா	ர	பு	...	8-5	12	0 62	0 13·5	11	124 ரா. கிருஷ்ணப்பா.	
-பா	ர	பு	...	8-5	12	0 62	0 [illegible]	07	608 ரா. ரங்கப்பா.	
-பா	ர	பு	...	8-5	12	0 62	0 [illegible]	0 10	526 ரா. முனி வெங்கடப்பா	
							1 [illegible]	0 75		

Village Administrative Officer. கடை குறி.
65. JAKKERI (Village),
DENKANIKOTTAI (Tk), Krishnagiri Dt

1		2	3	4	5	6	7	8	9	10	11	12
								ஏ. ஸ்ப.	டீஹ்ரு. ஹர்ஸ்	ரூ. பை.		
733	1	733-1	ர	பு	...	8-4	9	1 38	0 37·0	0 52	430 மு. பார்த் குமார்.	
	2	-2	அ	புற	...	...	...	...	0 26·5	...	...	பாதை.
	3	-3	ர	பு	...	8-4	9	1 38	0 86·5	1 20	763 க. வெங்கட சாமி.	
	4	-4	ர	பு	...	8-4	9	1 38	0 18·0	0 25	291 தி. சின்னசாமி.	
	5	-5	ர	பு	...	8-4	9	1 38	1 18·5	1 62	594 முனியம்மா.	
	6	-6	அ	பு	...	8-4	9	1 38	0 60·5	0 84	...	போடுகால்.
									3 47·0	4 43		
734	1A	734-1A	ர	பு	...	8-5	10	1 09	2 02·5	2 21	150 கூலன்.	
	1B	-1B	ர	பு	...	8-5	10	1 09	1 37·5	1 50	291 தி. சின்னசாமி.	
	2	-2	அ	புற	...	...	...	...	0 04·5	...	...	பாதை.
	3	-3	ர	பு	...	8-5	10	1 09	0 13·5	0 15	291 தி. சின்னசாமி.	
									3 58·0	3 86		
735	1	735-1	ர	பு	...	8-5	12	0 62	1 20·5	0 75	392 கோ. நாகரர்ஜ்.	
	2	-2	ர	பு	...	8-5	12	0 62	1 12·5	0 69	665 கோ. ராம கிருஷ்ணன்.	
									2 33·0	1 44		
736	1	736-1	அ	பு	...	8-5	12	0 62	0 52·5	0 33	...	போடுகால்.
	2	-2	ர	பு	...	8-5	12	0 62	1 24·5	0 77	391 நாராயணப்பா.	
	3	-3	ர	பு	...	8-5	12	0 62	0 30·0	0 18	764 வெங்கடேசப்பா.	
	4	-4	அ	பு	...	8-5	12	0 62	4 64·5	2 87	...	போடுகால்.
									6 71·5	4 15		
737	...	737	அ	பு	...	8-5	12	0 62	1 90·0	1 19	...	போடுகால்.
738	1	738-1	ர	பு	...	8-5	12	0 62	0 44·5	0 28	764 வெங்கடேசப்பா.	
	2	-2	ர	பு	...	8-5	12	0 62	1 23·5	0 76	228 சின்னம்மா.	
	3	-3	ர	பு	...	8-5	12	0 62	0 86·5	0 54	17 அபுஜாபீ.	

Village Administrative Officer
65. JAKKERI (Village),
DENKANIKOTTAI (Tk), Kri... Dt

1	2	3	4	5	6	7	8	9	10	11	12
							ரூ. பை.	ஹெ. ஏர்ஸ்	ரூ. பை.		
பழைய	புதிய										
738	4	738-4	ர	பு	...	8-5	12	0 62	1 09·0	0 68	467 பை. ரோஸ்.
	5	-5	அ	பு	...	8-5	12	0 62	0 22·5	0 14	... போடு கால்.
	6	-6	அ	பு	...	8-5	12	0 62	0 29·5	0 17	... போடு கால்.
									4 15·5	2 57	
739	1	739-1	அ	தீ.ஏ.த	...	...	...	...	1 68·0	...	... குள
	2	-2	ர	பு	...	8-4	10	1 09	0 85·0	0 94	716 வட்டா முனியப்பா.
									2 53·0	0 94	
							இராம மொத்தம் ...		1103 61·0	2101 53	(ரூபாய் இரண்டாயிரத்து நூற்றி ஒன்றும், பைசா ஐம்பத்தி மூன்று மட்டும்.)
		நீத்தம் நிலஅளவையில் எடுத்துக்கொண்டபடி							5·27·0		

ஆ-

ஆ. இ. சு

(ஒப்பம்) கி. குருராவ்,
ஆய்வாளர்,
நில உடைமைப்பதிவு மேம்பாட்டுத் திட்டம்,
தேன்கனிக்கோட்டை.
நாள் : 10—3—86

(ஒப்பம்) H. V. கோபாலகிருஷ்ண
தனி வட்டாட்சியர்,
நில உடைமைப்பதிவு மேம்பாட்டுத் தி
தேன்கனிக்கோட்டை.
நாள் ; 10—3—86

Village Administrative Officer
65. JAKKERI (Village),
DENKANIKOTTAI (Tk), Krishnagiri Dt

Annexure No : V

ABSTRACT

Natural Resources Department - Mines and Quarries – Minor Minerals – Amendments to Rule 8-A and 8-C of the Tamil Nadu Minor Mineral Concession Rules, 1959 - Notification – Issued.

Natural Resources (MME.1) Department

G.O. (Ms). No.5 **Dated: 26.10.2023**
சோபகிருது வருடம் – ஐப்பசி 9
திருவள்ளுவர் ஆண்டு 2054

Read:

1. G.O. (D) No. 92, Industries (MMB.1) Department, dated 06.09.2021.
2. G.O. (Ms) No. 94, Industries (MME.1) Department, dated 09.05.2022.
3. From the Commissioner of Geology and Mining, Chennai, Letters Rc.No.5864/MM2/2021, dated 23.06.2022, 30.03.2023, 25.05.2023 and 11.08.2023.

ORDER:

The Notification appended to this order will be published in the Tamil Nadu Government Gazette Extraordinary. The Works Manager, Government Central Press, Chennai-600 079 is requested to supply each 25 copies of the Notification to this department and Commissioner of Geology and Mining, Chennai-600 032 and to all District Collectors.

2. The Director, Tamil Development and Information (Translation) Department is requested to send the Tamil Translation of the Notification appended to this order to the Works Manager, Government Central Press, Chennai-600 079 for publishing in the Tamil Nadu Government Gazette and to the Collectors of all Districts for publishing it in the District Gazette immediately.

(BY ORDER OF THE GOVERNOR)

K. PHANINDRA REDDY
ADDITIONAL CHIEF SECRETARY TO GOVERNMENT (FAC)

To
The Works Manager,
Government Central Press,
Chennai – 600 079.

The Director,
Tamil Development & Information (Translation) Department,
Chennai – 600 009.

The Commissioner of Geology and Mining,
Guindy, Chennai – 600 032.

The Managing Director,
Tamil Nadu Minerals Limited,
Chepauk, Chennai – 600 005.

All District Collectors. (Through Commissioner of Geology and Mining)

The Accountant General, Chennai – 600 018.

Copy to:

O/o. the Hon'ble Minister (Water Resources), Chennai – 600 009.

The Law Department, Secretariat, Chennai – 600 009.

All Sections in Mining Wing, Natural Resources Department,
Chennai – 600 009.

The Industries, Investment Promotion and Commerce (OP.II/GIM/Budget) Department, Secretariat, Chennai-600 009.
SF/SCs.

//FORWARDED BY ORDER //

SECTION OFFICER

APPENDIX.

NOTIFICATION.

In exercise of the powers conferred by section 15 of the Mines and Minerals (Development and Regulation) Act, 1957 (Central Act 67 of 1957), the Governor of Tamil Nadu hereby makes the following amendments to the Tamil Nadu Minor Mineral Concession Rules, 1959, namely: -

AMENDMENTS.

(1) In the said Rules, - in rule 2, for clause (5-AA) the following clause shall be substituted, namely: -

"(5-AA) "Granite waste" means irregular pieces of granite which are not capable of being sold as dimensional granite block and may be used as road metal or a raw material for production of manufactured sand or for any other purpose";

(2) in rule 8-A, the sub-rule (13) shall be omitted;

(3) in rule 8-C, after sub-rule (10), the following sub-rule shall be added, namely: -

"(11) Granite waste may be sold as road metal or a raw material for production of manufactured sand or for any other purpose with the permission of the District Collector. The rate of seigniorage fee for granite waste shall be Rs.100/- (Rupees one hundred only) per tonne."

K. PHANINDRA REDDY
ADDITIONAL CHIEF SECRETARY TO GOVERNMENT (FAC)

// True Copy //

SECTION OFFICER

Annexure No : VI

Natural Resources (MME.1) Department,
Secretariat, Chennai-600 009.

Letter No.6588/MME.1/2022-6, dated 13.12.2023

From
Thiru. K. Phanindra Reddy, I.A.S.,
Additional Chief Secretary to Government (FAC)

To
The Commissioner of Geology and Mining,
Guindy, Chennai – 600 032.

Madam,

Sub: Mines and Minerals – Minor Mineral – Granite Wastes – Standard Operating Procedure for disposal of Granite Waste from the existing and expired leases in Government Lands granted under Tamil Nadu Minor Mineral Concession Rules, 1959 – Issued – Regarding.

Ref: 1) Your Letter Rc.No.5864/MM2/2021, dated 10.11.2023.

2) G.O.Ms.No.5, Natural Resources (MME.1) Department, dated 26.10.2023

*****

I am directed to enclose the guidelines for Standard Operating Procedure for disposal of Granite Waste from the existing and expired leases in Government Lands granted under Tamil Nadu Minor Mineral Concession Rules, 1959 for information and necessary action.

Yours faithfully,

M. Prabavathi
13/12/2023
for Additional Chief Secretary to Government (FAC)

STANDARD OPERATING PROCEDURE FOR DISPOSAL OF GRANITE WASTE FROM THE EXISTING AND EXPIRED LEASES IN GOVERNMENT LANDS GRANTED UNDER TAMILNADU MINOR MINERAL CONCESSION RULES, 1959.

1. Granite Waste

"Granite waste" means irregular pieces of granite which are not capable of being sold as dimensional granite block that may be used as road metal or a raw material for production of manufactured sand or for any other purpose."

2. Storage of Granite waste

Granite waste shall be stored separately away from the working pit, within the lease boundary.

3. Disposal of granite waste from the existing leases of Tvl.TAMIN Ltd. in Government lands:

i. Application for grant of Permission to remove and transport Granite Waste

Tvl.TAMIN Ltd, if desires to remove or transport granite waste from the lease hold area in government land, shall submit an application fifteen days prior to such removal or transport of Granite waste to the District Collector concerned under a copy marked to the concerned Regional Joint Director along with following details:

(i). The latest Half-yearly return filed under rule 41(1) (a) of the Granite Conservation and Development Rules, 1999.

(ii). Quantity of waste rock, non-saleable granite generated during the quarry operation.

(iii). "kmz" file of the periphery of each Granite Waste dump.

(iv). Approximate quantity of each granite waste dump, within the leased area.

(v). Field photographs of the granite waste proposed to be transported from the lease hold area with Geo-coordinates.

ii. Inspection Report of the Team

On receipt of the application, the District Collector shall constitute a team of officials from the Department of Geology and Mining and Survey Department. The team shall inspect the lease hold area and verify the details

furnished by Tvl TAMIN Ltd and submit a field inspection report within a week to the District Collector, with the following details:-

(i). Quantity (in terms of metric tons) of each Granite waste dump furnished by Tvl TAMIN Ltd;

(ii). Granite blocks quarried and kept for despatch at the time of Inspection should be accounted properly;

(iii). The report shall ensure that the granite wastes proposed to be transported are as per the definition in the Tamil Nadu Minor Mineral Concession Rules, 1959.

(iv). Field photographs of the granite waste proposed to be transported from the lease hold area.

iii. Grant of Permission to remove and transport Granite Waste

(i). After obtaining report from the Team, the District Collector shall pass an order within one week to remove the Granite Waste from the leasehold area.

(ii). If rejected, the reasons are to be recorded in writing and the same shall be communicated to Tvl.TAMIN Ltd.

iv. Issuance of Transport Permit to remove and transport granite waste

(i). Tvl.TAMIN Ltd shall remit the seigniorage fee for granite waste of Rs.100/- (one Hundred rupees only) per tonne along with the contributions to the Green Fund and District Mineral Foundation Trust and any other fee applicable.

(ii). On remittance of Seigniorage fee, contribution for Green Fund and District Mineral Foundation Trust and any other fee applicable, the Deputy Director/Assistant Director shall grant transport permit and facsimiled despatch slips for the period specified by the Deputy Director/Assistant Director subject to such terms and conditions as may be specified in the order of grant.

(iii). Tvl.TAMIN Ltd shall remove or allow removal or transport or carry away granite waste from the area where the quarrying is permitted only after obtaining bulk transport permit and facsimiled despatch slips in the forms prescribed.

4. Disposal Of Granite Waste From Expired Quarries in Government lands:

(i). The sub-rule rule (5) (f)of Rule 36 of TNMMCR applicable to quarrying permit holder and lessee states that

(a) No person is entitled to remove any mineral from any land after expiry of the period of the quarrying permit or quarrying lease granted under these rules.

(b) The Person quarrying under a permit or lease in any area under the rules in Section II shall not keep in the land any engine, machinery, plant, articles or things whatsoever after the expiry of the period of the quarrying permit or quarrying lease and they shall be removed from the land on the last day of the quarrying permit or quarrying lease.

(ii). All such granite wastes as well as the saleable blocks available in the expired leases will be disposed of by the Government through competitive bidding.

(iii). The Deputy Directors/Assistant Directors of Geology and Mining in the district concerned shall prepare a list of expired granite quarries with all relevant details viz. Name and address of the lessee, Taluk, Village survey numbers, extent, classification of the land, Government order granting quarry lease, period of lease, date expiry of the lease, etc. and inspect each such quarry for estimating the quantum of old dressed, undressed, saleable and non-saleable granite blocks and the granite wastes available in the area separately. All the granite blocks available in the area shall be numbered category wise and properly accounted for in the registers.

(iv). Regarding disposal of dressed and undressed granite dimensional blocks available in the expired quarries, a separate auction shall be conducted by following the procedures for disposing the granite wastes as given below.

(v). As regards the granite wastes, Deputy Director / Assistant Director shall outsource an agency to conduct drone survey from the agencies empanelled by the Commissioner of Geology and Mining for surveying expired granite quarries for estimating the quantity of granite wastes available in the area.

(vi). The outsourced agencies for Drone survey shall submit their report with specific information on the quantity of granite waste available within / belonging to the expired granite quarries by surveying and assessing

each dump/stack separately, within fifteen days from the date of issue of work order to them along with the following:

a. "kmz" file of the periphery of each Granite Waste dump;

b. Dump-wise / Stack-wise quantity of the granite wastes/ overburden available within / belonging to the expired lease area and

c. Field photographs of each dump of the granite wastes proposed to be transported from the lease expired area with Geo-coordinates.

(vii). The floor price for e-auctioning of each dump / stack of granite wastes shall be fixed by Deputy Director / Assistant Director as follows:

a) If the granite wastes available is of substantial size and are usable for the production of value added products such as small decorative stones such as slabs / tiles or monuments or statues, etc., the floor price of the wastes shall be fixed as per the methodology prescribed by the Commissioner of Geology and Mining.

b) If the granite wastes available is useful only for manufacturing M-sand or as building/construction material directly or by size reducing, the floor price shall be fixed based on the cost of rough stone.

(viii). Auction will be conducted on the floor price. H1 will have to pay the seigniorage fee, Contributions to Green Fund and District Mineral Foundation Trust.

(ix). Tvl. TAMIN Ltd. shall be the agency to conduct e-auction for the granite wastes. In this connection, necessary fee, as decided by the Government from time to time, shall be paid Tvl. TAMIN Ltd. for utilizing their service as the Agency for auctioning the granite wastes.

(x). Therefore, on fixation of floor price, the District Collector concerned shall send proposals to Tvl.TAMIN Ltd. for e-auctioning the wastes in the expired quarries with the detailed list of expired granite quarries as mentioned in para (vi) along with FMB sketch, combined sketch and drone image of the area of the expired lease area, the floor price fixed for each expired quarry, etc. under intimation to the Regional Joint Director concerned. Tvl. TAMIN Ltd. shall prepare the tender document and fix a date to conduct e-auction of the granite wastes.

(xi). Tvl. TAMIN Ltd. shall publish the Notice Inviting Tender in the District Gazette, the Daily Newspapers in Tamil and English and in their official website not less than fifteen days prior to the date of such e-auction.

(xii). The Notice Inviting Tender shall contain-

a) The details of e-auction portal;

b) Last date for submitting application for e-auction and date of conducting e-auction;

c) the details of the area wherein the granite wastes are available viz., District, Taluk, Survey No., extent, classification of the land, FMB sketches, combined sketch and Images taken by drone survey with geo-coordinated boundary of the area;

d) the dump / stack-wise details of the quantity of the granite wastes available in the area;

e) The period of grant of permit for the removal and transportation of granite wastes and

(xiii). The interested bidders should pay a non-refundable fee of Rs.5,000/- for participating in the auction to the bank account opened by Tvl. TAMIN Ltd. for the purpose through the payment gateway provided in the website to participate in the e-auction.

(xiv). All the bidders participating in the auction shall pay a refundable bid security deposit of Rs.5,00,000/-(Rupees Five Lakhs Only) or an amount equal to 0.1% of the price of the total estimated quantity of the granite wastes available in the quarry, whichever is higher, through Electronic Clearance Services (ECS) to the bank account opened by Tvl. TAMIN Ltd. for the purpose through the payment gateway provided in the website. On conclusion of the auction, the bid security amount paid by the successful bidder shall be adjusted in the bid amount to be paid by him and in respect of all other bidders, the bid security amount shall be refunded.

(xv). Tvl. TAMIN Ltd. shall conduct auction for selling the granite wastes as per the existing procedures to sell the Government property through competitive bidding by auctioning under the Act and Rules concerned. The auction shall be an ascending forward online electronic auction.

(xvi). The bidder who offers highest final bid amount which is higher than the floor price shall be declared as successful bidder by Tvl TAMIN Ltd. If none of the bidders offers a final bid amount higher than the floor price, the e-auction process shall be annulled and the area may be brought for re-auction by publishing a Notice Inviting Tender, *de novo,* in this regard.

(xvii). On declaration of the name of the successful bidder by Tvl. TAMIN Ltd., the successful bidder shall pay 100% of the bid amount, deducting the bid security amount paid by him, and the applicable seigniorage fee,

contributions to green fund and District Mineral Foundation Trust and any other amount as applicable, within 24 hours of conclusion of auction. The bid amount shall be remitted through Electronic Clearance Services (ECS) to the bank account opened by Tvl. TAMIN Ltd. for the purpose through the payment gateway provided in the website. The seigniorage Fee and contributions to Green Fund shall be paid to concerned Head of Account and the contribution to District Mineral Foundation Trust shall be remitted to the concerned bank account of the DMFT.

(xviii). The payment gateway provided for the payment of 100% bid amount shall provide for the payment of the agency fee to Tvl. TAMIN Ltd. on the date of payment of the amount, as may be decided by the Government.

(xix). Tvl. TAMIN Ltd. shall remit the non-refundable tender document fee paid by the participants and the 100% bid amount paid by the successful bidder to the Government exchequer within 24 hours from the time of remittance by the successful bidder.

(xx). After the conclusion of the e-auction, Tvl. TAMIN Ltd. shall send a detailed report with the details of auction, the details of successful bidders, details of payment, etc. to the District Collector concerned under copies to the Deputy Director / the Assistant Director of Geology and Mining of the district concerned, the Commissioner of Geology and Mining and the Government.

(xxi). On receipt of such report, the District Collector concerned shall issue an order granting the permit to the successful bidder within a week from the date of receipt of such report and communicate the same to the Regional Joint Director.

(xxii). On issuing the order granting the permit, the Deputy Director/ Assistant Director of Geology and Mining shall grant bulk transport permit and facsimiled despatch slips for the period specified by the Deputy Director/Assistant Director to the permit holder, whenever requested, for transportation of the granite wastes from the specified expired quarry subject to such terms and conditions as may be specified in the order granting the permission.

(xxiii). The permit holder shall remove or transport or carry away granite waste from the specific expired quarry only after obtaining bulk transport permit and facsimiled despatch slips from the Deputy Director/ Assistant Director of Geology and Mining in the forms prescribed.

(xxiv). The Deputy Director/ Assistant Director of Geology and Mining shall maintain registers for the issuance of transport permits for the removal and transportation of granite wastes and the quantity of granite wastes thus removed shall be properly accounted for and monitored.

5. Special conditions for the removal and transportation of granite waste by Tvl.TAMIN Ltd. or by the permit holder:

i. Tvl.TAMIN Ltd. or the permit holder shall not transport or carry away the dressed granite blocks/stocked granite blocks from the lease hold area / expired lease area using the transport permits issued for the granite waste.

ii. The granite wastes transported by Tvl.TAMIN Ltd or the permit holder shall be loaded and weighed before the officer authorized by the Regional Joint Director.

iii. Tvl.TAMIN Ltd or the permit holder shall be allowed to transport granite waste only during 9.00 am to 5.00 pm.

iv. Tvl.TAMIN Ltd or the permit holder shall maintain correct accounts showing the quantity of the Granite waste generated and despatched from the quarry.

v. Non possession of the transport permit during the transport of the granite waste shall be construed as illicit transport of granite waste and entitles penal action as per MMDR Act, 1957 and action may be initiated against the Tvl.TAMIN Ltd or the permit holder under the Tamil Nadu Minor Mineral Concession Rules, 1959 or the Tamil Nadu Prevention of illegal Mining, Transportation and Storage of Minerals and Mineral Dealer's Rules, 2011, whichever is applicable.

vi. The permit holder shall submit monthly and half yearly returns on the removal and transportation of granite wastes to the Deputy Director/Assistant Director of Geology and Mining of the district concerned under a copy to the Regional Joint Director and the Commissioner of Geology and Mining in formats prescribed in Proforma III in the Annexure.

6. Monitoring:

i. The entire process shall be monitored by the Regional Joint Directors of the concerned jurisdictions.

ii. The Regional Joint Directors shall draw their plan of action based on the number of requests received from as well as the number of proposals for e-auction sent to Tvl.TAMIN Ltd. in each districts within their jurisdiction.

iii. The total quantum of granite waste and permit issued details of granite waste shall be recorded in writing in the pit's mouth/stock register by Tvl.TAMIN Ltd. or by the permit holder, as the case may be, and the same shall be verified and countersigned by the Assistant Director/ Deputy Director of Geology and Mining regularly.

iv. The Director of Geology and Mining shall depute sufficient staff for this purpose wherever required, including the officials of the flying squad, based on the request of the Regional Joint Director. The despatch of the granite waste shall happen only under the direct supervision of the officials of Geology and Mining including the officials of the flying squad.

v. The officials of Geology and Mining including the Flying Squad shall ensure that any dressed or undressed granite blocks suitable for commercial use as dimensional stones are not transported in the guise of waste granites and if any such transportation found out, necessary penal action shall be initiated under Section 22 of Mines and Minerals (Development and Regulation) Act, 1957.

7. Submission of Periodicals

The Deputy Director/Assistant Director of Geology and Mining of the district concerned shall submit daily and half yearly periodical reports to the Commissioner of Geology and Mining in the formats in Proforma I, II in the Annexure.

K. PHANINDRA REDDY
ADDITIONAL CHIEF SECRETARY TO GOVERNMENT (FAC)

// True Copy //

M. Prabavathi
13/12/2013
SECTION OFFICER

ANNEXURE

Performa – I

Daily Report on the dispatch of Granite Wastes for _____(DD/MM/YY)

Sl. No	Name & address of the Lessee / Permit holder	Total Quantity of Granite Waste permitted to be removed/ transported during___ (in MT)	Opening Balance on - (DD/MM/YY) (in MT)	Quantity of Granite Waste generated on (DD/MM/YY) (in MT) [Applicable only for existing quarries of Tvl. TAMIN Ltd.]	Quantity of Granite Waste despatched on (DD/MM/YY) (in MT)	Closing Balance on (DD/MM/YY) (in MT)	Payment Details in Rs.				Remarks (Violation committed, if any, etc.)
							S.F.	Green Fund	DMFT Fund	Total	

Performa – II

Half yearly Report on the dispatch of Granite Wastes for 1st/2nd half of 20__

Sl. No	Name & address of the Lessee Permit holder	Total Quantity of Granite Waste permitted to be removed/ transported during___ (in MT)	Opening Balance as on 01.04.20__ (in MT)	Quantity of Granite Waste generated during 01.04.20__ to 30.09.20__ (in MT) [Applicable only for existing quarries of Tvl. TAMIN Ltd.]	Quantity of Granite Waste despatched during 01.10.20__ to 31.03.20__ (in MT)	Closing Balance as on 31.03.20__) (in MT)	Payment Details in Rs.				Remarks (Violation committed, if any, etc.)
							S.F.	Green Fund	DMFT Fund	Total	

Performa – III

Monthly returns on the dispatch of Granite Wastes for the month of _____20__

1.	Name & address of the Lessee / Permit holder	:	

To

The Deputy Director/ Assistant Director, Geology and Mining, _____ District.

1.	Details of the Quarry Lease/expired quarry lease:	:	
	Name:	:	
	District :		
	Taluk :	:	
	Village :	:	
	Survey No.	:	
	Extent:	:	
2.	The Order granting lease / Permit	:	
3.	Validity Period of the Quarry lease/ Permit	:	

Sl. No	Total Quantity of Granite Waste permitted to be removed/ transported during ___ (in MT)	Opening Balance Balance on the first day of the month (in MT)	Quantity of Granite Waste generated during ___ (month) (in MT)	Quantity of Granite Waste despatched during ___ (month) (in MT)	Closing Balance on the last day of the month (in MT)	Payment Details in Rs. [Applicable only for existing quarries of Tvl. TAMIN Ltd.]				Value of the granite waste despatched	End User
						S. F.	Green Fund	DMFT Fund	Total		

K. PHANINDRA REDDY
ADDITIONAL CHIEF SECRETARY TO GOVERNMENT (FAC)

// True Copy //

M Prabavathi
13/12/2023
SECTION OFFICER

Annexure No : VII

Tamil Nadu Minerals Limited
(A Government of Tamil Nadu Undertaking)

TAMIN

Tel : 044-28415003 / 28511972
Fax : 91-44-2852 4960
E-mail : tamin@tamingranites.com
GSTIN. : 33AABCT2250P1ZA
WEB : www.tamin.co.in

Regd.Office : No.31, Kamarajar Salai, "TWAD House" Chepauk, Post Box No.2961, Chennai - 600 005.

Rc No. 9456/ML1/2017 **Dated: 20.02.2024**

TO WHOM SO EVER IT MAY CONCERN

This is to certify that Dr.E.Ganesan is working as Deputy Manager (Mining Lease) in Tamil Nadu Minerals Limited, Chennai. His qualification and experience is given below.

Qualification:-

1. M.Sc., (Geology)
2. MBA
3. Ph.D (Environmental Geology)
4. PGDELP (Post Graduate Diploma in Environmental Law & Policy)
5. Second Class Mines Manager Certificate of Competency (Restricted) Certificate No. SMR/5390, dated.06.05.2014.

Experience:-

Sl No	Name of Projects	Designation	Nature of work	Period	Total period
1.	Sivagangai Graphite Mine	Project Officer (Trainee)	Mining Geologist & over all mining supervision	23.06.1993 to 23.06.1994	Years : 01 Months : 00 Days : 00
2.	-do-	Project Officer	-do-	24.06.1994 to 09.07.1997	Years : 03 Months : 00 Days : 15
3.	Lakmanaickenpatti Quartz & Feldspar Mine	Project Officer	Mining Geologist & over all mining supervision in statutory capacity	03.05.2002 to 23.08.2002	Years : 00 Months : 03 Days : 20
4.	Periyanagalur Limestone Mine	Divisional Manager i/c	-do-	17.10.2012 to 14.07.2013	Years : 00 Months : 08 Days : 27
	Total period of experience				**Years : 05 Months : 01 Days : 02**

The Regional Controller of Mines, Indian Bureau of Mines (IBM), Chennai Region has already issued the Recognized Qualified Person (RQP) Certificate to him vide RQP/MAS/036/88/B, dated.21.10.2014. This certificate is issued only for preparation of Mining Plan / Scheme etc., as per Rules in force.

for **Tamil Nadu Minerals Ltd,**

Nominated Owner /Managing Director

ROP CERTIFICATE

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES

CERTIFICATE OF RECOGNITION AS QUALIFIED PERSON
(Under Rule 22C of Mineral Concession Rules, 1960)

ROP/MAS/08/2018

Regional Controller of Mines
Indian Bureau of Mines
Chennai Region

ANNEXURE I

1. Shri S. Subramanian, Selection Grade Divisional Manager
2. Shri K. Ghanmugam, Selection Grade Senior Project Officer
3. Shri P. Dhidharan, Selection Grade Divisional Manager
4. Shri E. Ganesan, Selection Grade Project Officer
5. Shri S. Venkatachalapathi, Project Officer
6. Shri A. Ramchandran, Selection Grade Project Officer

Annexure No : VIII

Tamil Nadu Minerals Limited, Chennai-600 005

List of Board of Directors

1. **Thiru.K.Phanindra Reddy, I.A.S.,**
   Chairman,
   Tamil Nadu Minerals Limited and
   Additional Chief Secretary to Government
   Natural Resources Department, [Full Additional Charge]
   Secretariat, Chennai–600 009.

2. **Thiru.Anil Meshram,I.A.S.,**
   Managing Director,
   Tamil Nadu Minerals Limited
   Chepauk, Chennai–600 005.

3. **Thiru.L.Nirmal Raj, I.A.S.,**
   Industries Commissioner and Director of Industries Commerce,
   2nd Floor and 3rd Floor, SIDCO Corporate Office Building,
   Thiru-Vi-Ka Industrial Estate,
   Guindy, Chennai–600 032.

4. **Thiru.M.J.Devaraj,**
   Deputy Secretary to Government,
   Industries, Investment Promotion & Commerce Department,
   Secretariat, Chennai–600 009.

5. **Thiru. G.K. Arun Sundar Thayalan, I.A.S.,**
   Additional Secretary to Government,
   Finance Department, Secretariat, Chennai–600 009.

6. **Tmt.Pooja Kulkarani, I.A.S.,**
   Commissioner of Geology and Mining,
   Guindy, Chennai–600 032.

7. **Dr. T.Subramani, Ph.D.,**
   Professor and Head,
   Department of Mining Engg., Anna University,
   Guindy, Chennai - 600 025.

8. **Thiru. P. Sankara Kumar, B.Com., B.L.,A.C.S.,**
   Independent Director,
   Old.No.88, New No.227, North Madhavaram High Road,
   Perambur, Chennai–600 011.

9. **Thiru. R. Pitchai Muthu, M.Sc.,**
   Independent Director,
   No.82, LGB Nagar, East Street,
   Karur–639 002 Cell:9444025938

10. **Dr.Godwin Tennyson,**
    Professor in Operations, Management and Decision Sciences,
    Indian Institute of Management,Pudukkottai Main Road,
    Chinna Sooriyur Village, Trichirappalli - 620 024.

11. **Dr.Biswajit Paul,**
    Professor, Dept. of Environmental Science and Engineering,
    Centre of Mining, Indian Institute of Technology,
    (Indian School of Mines)
    Dhanbad - 826 004.Jarkhand.

COMMISSIONERATE OF GEOLOGY AND MINING

From
Tmt.Pooja Kulkarni, I.A.S.,
Commissioner,
Department of Geology and Mining,
Guindy, Chennai - 600 032.

To
The Managing Director,
Tvl. TAMIN Ltd.,
No.31, Kamarajar Salai,
TWAD House, Chepauk,
Chennnai -05.

Rc. No.8664/MM4/2019, dated: 22.05.2024

Sir,

Sub: Mines and Minerals – Minor Mineral – Colour Granite – Krishnagiri district - Denkanikottai taluk – Jakkery village - over an extent of 27.04.50 Ha of Government land – S.F.Nos.486(P) (22.40.00 Ha) & 736/4 (4.64.50 Ha) – quarry lease application preferred by Tvl.TAMIN Ltd., Chennai – Precise area communicated by the Government – Draft Mining Plan submitted by Tvl.TAMIN Ltd., Chennai - Recommended by the Deputy Director (G&M), Krishnagiri - Approval accorded.

Ref:
1. The Commissioner of Geology and Mining original file no. Rc.No.8664/MM4/2019 dated 26.09.2023 forwarded under single file system.
2. Government letter no. 5883890/MME.2/2023-1 dated 14.02.2024.
3. G.O.(D)No.26 Natural Resources (MMA-1) Department dated 05.03.2024.
4. Draft Mining Plan Submitted by Tvl.TAMIN Ltd., Chennai dated 10.04.2024.
5. The Deputy Director of Geology and Mining, Krishnagiri letter Rc.No.829/2018 (Mines), dated 07.05.2023.
6. Other Connected Documents.

****

Kind attention is invited to the above references cited.

2) A quarry lease application preferred by Tvl.TAMIN Ltd., for quarrying colour granite over an extent of 27.04.50 ha of Government land in S.F.Nos.486(P) (22.40.00 Ha) & 736/4 (4.64.50 Ha) of Jakkery village, Denkanikottai taluk, Krishnagiri district was forwarded to the Government by the Commissioner of Geology and Mining vide reference 1st cited for grant of quarry lease under rule 8-C of TNMMCR, 1959. The Government vide letter dated 14.02.2024 have communicated the precise area for an extent of

27.04.50 ha and requested the applicant company to submit the approved mining plan through the Commissioner of Geology and Mining and to produce environmental clearance obtained from the competent authority for the subject area for grant of quarry lease.

3) Accordingly, the mining plan submitted by Tvl.TAMIN Ltd., has been forwarded and recommended by the Deputy Director, (G&M), Krishnagiri vide reference 4th cited for the subject area for approval.

4) On scrutinizing the mining plan submitted by Tvl.TAMIN Ltd., Chennai and the report of the Deputy Director (G&M), Krishnagiri, the following are submitted.

i. The Deputy Director (G&M), Krishnagiri has reported that the Hill Area Conservation Authority has recommended the proposal for renewal of quarry lease for quarrying colour granite in S.F. No 483 (P) and 736/4 over an extent of 27.04.05 he of Government land vide Director of Town and Country Planning letter Rc.No.11938/2023/HACA dated: 26.07.2023.

ii. The draft mining plan is prepared by the Recognized Qualified Person and the details such as geological, mineable reserves, year wise production and development program have been incorporated in the draft mining plan.

iii. The proposed year wise production:

Year	ROM		Saleable colour Granite Recovery @ 25%		Saleable colour Granite Waste @ 75%	
	M³	MT	M³	MT	M³	MT
1st year	6001	15903	1500	3975	4501	11928
2nd year	7202	19085	1800	4770	5402	14315
3rd year	8800	23320	2200	5830	6600	17490
4th year	9601	25443	2400	6360	7201	19083
5th year	10000	26500	2500	6625	7500	19875
TOTAL	**41604**	**110251**	**10400**	**27560**	**31204**	**82691**

iv. As per the Mining plan submitted by Tvl.TAMIN Ltd., it is mentioned that the total mineable reserves @ 25% recovery is about 7,38,292 cbm for a total depth of 30 m. Production for first 5 years Mining plan period is 10,400 cbm at 25% recovery for a depth of 30m. The total ROM during the Mining Plan period is 41,604 M^3 or 1,10,251MT.

v. With regard to the dumping of waste during the Mining Plan period, it has been proposed to dump on the northern side of the lease boundary area.

vi. The Deputy Director, (G&M), Krishnagiri has furnished the details of existing quarries, expired/abandoned quarries, and other proposal / applied quarries situated within 500 m radial distance of the subject lease area.

vii. There are no archeological monuments within 300 m and no wildlife sanctuary within 1 km radial distance of the subject lease area.

viii. Finally, the Deputy Director (G&M), Krishnagiri has recommended and forwarded the mining plan submitted by Tvl. Tamil Nadu Minerals Limited, Chennai for quarrying Colour Granite over an extent of 27.04.50 ha in S.F.Nos.486(P) (22.40.00 Ha) & 736/4 (4.64.50 Ha) of Jakkery village, Denkanikottai taluk, Krishnagiri district to the Commissioner of Geology and Mining, Chennai for approval.

ix. The Government Vide G.O (D) No. 43 Industries (MME) Department dated 16.05.2022 have exempted Tvl. TAMIN ltd., in remittance of arrears of dead rent and area assessment upto 2023. Further, the Government vide G.O.(D)No.26 Natural Resources (MMA-1) Department dated 05.03.2024 have granted extension for two years upto 31.03.2025 to Tvl TAMIN Ltd., for deferring the payment of Dead Rent and Area Assessment and other mining dues payable by Tvl TAMIN Ltd.

5) The mining plan submitted by Tvl.TAMIN Ltd, and report of the Deputy Director (G&M), Krishnagiri have been examined with reference to the provisions of Rule 12,13 and 15 of Granite Conservation and

Development Rules, 1999 read with G.O.(Ms). No. 87, Industries (MMC.1), Department dated: 22.02.2001. Based on the recommendation of the Deputy Director (G&M), Krishnagiri the mining plan submitted by Tvl.TAMIN Ltd, is hereby is hereby approved subject to the following conditions in addition to the conditions stipulated in the precise area communication vide reference 2nd cited.

i. This mining plan is approved without prejudice to any other Law applicable to the quarry lease from time to time whether such Laws are made by the Central Government, State Government or any other authority.

ii. 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 and 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. This mining plan including progressive mine closure plan is approved without prejudice to any other order or direction from any court of competent jurisdiction.

iv. Provisions of the Mines Act, 1952 and the Rules and Regulations made there under including submission of notice of opening, appointment of manager and other statutory officials as required under Mines Act, 1952 shall be complied with.

v. Provisions made under Mines and Minerals (Development & Regulation) Act, 1957, MMDR Amendment Act, 2015 and Granite conservation and Development Rules, 1999 made there under shall be complied with.

vi. Relaxation to be obtained under Rule 106(2)(b) of Metalliferous Mines Regulations, 1961 from the Director of Mines Safety, if necessary.

vii. If anything is found to be concealed as required by the Granite Conservation and Development Rules, 1999 and Tamil Nadu Minor Mineral Concession Rules, 1959 and proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.

viii. A green belt should be constructed to prevent sound and air pollution due to the proposed quarrying activity by planting at least 250 seedlings all along the boundary the area.

ix. Tvl. TAMIN Ltd., should remit the dead rent, and area assessment and other dues if any related to this quarry after the expiry of date of deferrel, ie, 31.03.2025 (as per G.O. (D) No. 26, Natural Resources (MMA-1) department at 05.03.2024.

x. No hindrance shall be caused to the adjacent Patta lands and Government poramboke lands if any while quarrying and transportation of granite if any.

xi. The applicant company shall strictly adhere to the statutory and safety requirements and the applicant company should ensure the periodical medical checkup to the quarry workers to safeguard them from quarry related diseases.

xii. No blasting and transportation of materials in vehicles should be carried out from 5.00 PM to 7.00AM.

xiii. The waste materials generated during the course of quarrying should be dumped only within the lease hold area that will be earmarked for the purpose in the mining plan as per rule 31 of GCDR, 1999.

xiv. The applicant company shall submit Scheme of Mining, mine closure plan and other statutory requirements within the time stipulated for submission of the above as per rules.

xv. The applicant company should fence the lease granted area with barbed wire before the execution of lease deed as follows.

- The pillar post shall be firmly grounded with concrete foundation of height not less than 2 m with a distance between two pillars shall not be more than 3mts.

- The applicant company shall incorporate the DGPS readings for the entire boundary pillars of the area and the same should be clearly shown in the mining plan.
- A soft copy of the digitized map with DGPS readings should be submitted in CD to the Deputy Director (G&M), Krishnagiri.

xvi. The boundary stone should be fixed for the subject quarry should be fixed and the district administration / Geology and Mining Department should ensure that the quarrying operation should be restricted only within the area granted for lease.

xvii. Environment Clearance should be obtained from the competent authority in respect of the subject area as per rule 42 of Tamil Nadu Minor Mineral Concession Rules, 1959 and as per the notification of the Ministry of Environment and Forest and any other clearances if any.

xviii. As per rule 12 (v) of Mineral (other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016, the applicant company shall at his own expense, erect, maintain and keep in repair all boundary pillars.

xix. The conditions mentioned in G.O No. 79 Industries Department dated 06.04.2015 should be complied with.

xx. The applicant company may use mild explosives during quarrying, and storing of explosives if required, by obtaining valid license under explosive Acts and Rules.

xxi. If any violation is found during quarrying operation, the penal provisions of Tamil Nadu Minor Mineral Concession Rules 1959 and other rules and act in force will attract.

xxii. Child labour should not be engaged in the quarry works and the quarry workers should be enrolled in the insurance sche me through the Labour Department.

xxiii. The applicant company should remit the Stamp Duty as per the approved modified mining plan during the currency of the lease period.

xxiv. The earlier instances of irregular / illegal quarrying, if any, shall not be regularized through the approval of this document.

xxv. The applicant company shall remit the penalty / cost of mineral / other dues if any as arrived by the District Collector / Deputy Director (G&M), Krishnagiri district.

xxvi. Non adherence to any condition set-out above, the approval shall be deemed to have been withdrawn with immediate effect.

xxvii. The applicant company should comply with the additional conditions stipulated in the Government of India, Ministry of Mines, Order No.11/02/2020, dated.14.01.2020 issued as per the Order of the Hon'ble Supreme Court of India, dated.08.01.2020 states that, "The Mining lease holders shall after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc".

xxviii. The applicant company should carry out DGPS survey and erection of RCC boundary pillars as per the norms stipulated in the EOI notification in Rc.No.2921/MM4/2019 dated.01.02.2018 and subsequent corrigendum dated 13.08.2019.

Encl: 2 Copies of Approved
Mining Plan.

Sd/- Pooja Kulkarni
Commissioner of Geology and Mining

Forwarded / By Order

Additional Director

Copy Submitted to:

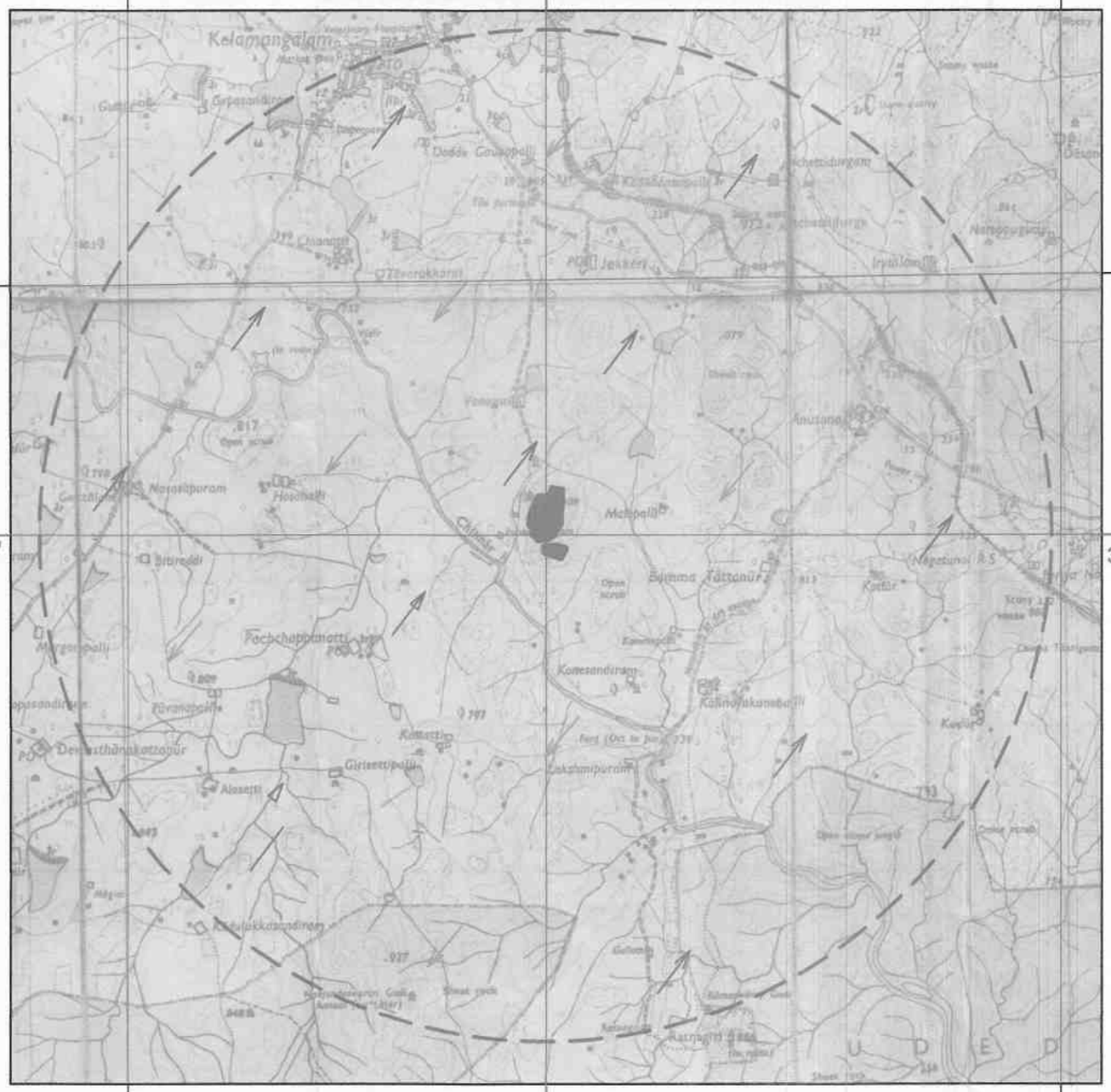
1. The Additional Chief Secretary
to Government, (FAC),
Naturaal Resources Department,
4th Floor, Secretariat, Chennai-9.

2. The Director of Mines Safety,
   3rd Floor, Left Wing,
   New Additional Building,
   CGO Complex, Shastri Bhawan,
   Nungambakkam, Chennai - 06
3. The District Collector,
   Krishnagiri District.

77° 50' 00" | 77° 52' 13.0925" | 77° 55' 00"

12° 35' 00"

12° 33' 54.6401"



N

12° 35' 00"

12° 33' 54.6401"

77° 50' 00" | 77° 52' 13.0925" | 77° 55' 00"

INDEX

- MINING LEASE APPLIED BOUNDARY
- SAFETY ZONE 5Km. RADIUS
- ROAD
- UNMETALLED ROAD
- RESERVOIR
- STREAM / RIVER
- CONTOUR (100)
- R.F. BOUNDARY

WIND DIRECTION

WINTER

SUMMER

DISTRICT	:	KRISHNAGIRI
TALUK	:	DENKANIKOTTAI
VILLAGE NAME	:	JAKKERY
VILLAGE NO.	:	65
FIELD NOs.	:	486/Part & 736/4
LEASE HOLD AREA	:	22.40.0Ha.(486/Part)
		4.64.5Ha.(736/4)
TOTAL	:	27.04.5Ha.

PLATE No.1

JAKKERY COLOUR GRANITE QUARRY

KEY PLAN

PART OF TOPO SHEET NO: 57H/14

EASTERN LONGITUDE FROM 77° 52' 04.4577" TO 77° 52' 20.6766"

NORTHEN LATITUDE FROM 12° 33' 35.0350" TO 12° 34' 03.4026"

500 0 2500 5000

SCALE= 1:50,000(1CM = 500 M)

ALL DIMENSIONS ARE IN METRES

APPLICANT:-- M/s.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

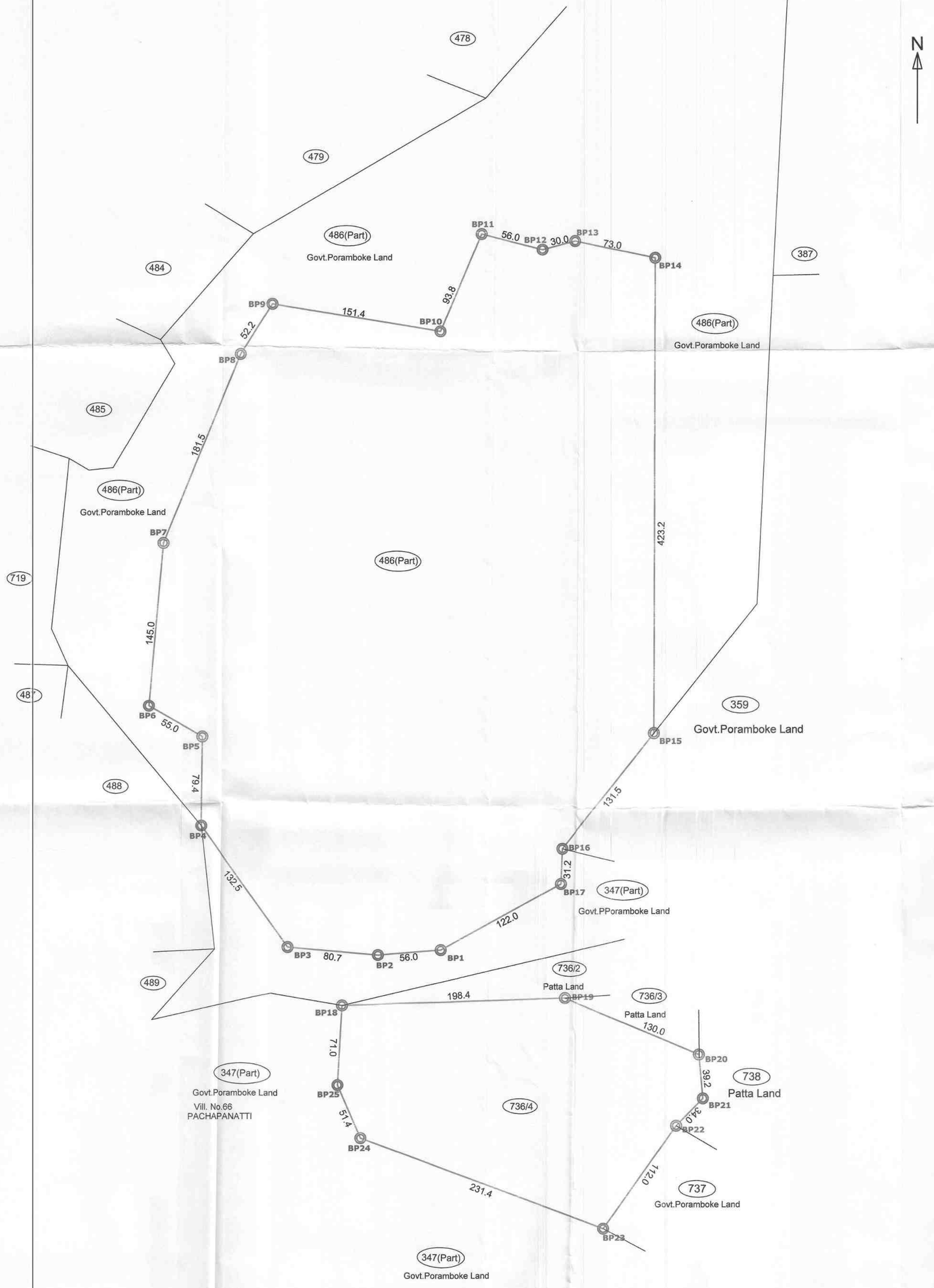
Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

LEGEND

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	———
2.	BOUNDARY PILLAR	○ BP1 TO BP25
3.	SURVEY FIELD No.	736/4



Sl.No	Boundary Pillar No	Latitude	Longitude
1	BP1	12° 33' 43.1600" N	77° 52' 12.9811" E
2	BP2	12° 33' 43.0346" N	77° 52' 11.1318" E
3	BP3	12° 33' 43.3031" N	77° 52' 08.4746" E
4	BP4	12° 33' 46.8346" N	77° 52' 05.9625" E
5	BP5	12° 33' 49.4151" N	77° 52' 06.0223" E
6	BP6	12° 33' 50.3287" N	77° 52' 04.4577" E
7	BP7	12° 33' 55.0298" N	77° 52' 04.9377" E
8	BP8	12° 34' 00.4675" N	77° 52' 07.2727" E
9	BP9	12° 34' 01.9321" N	77° 52' 08.2144" E
10	BP10	12° 34' 01.0777" N	77° 52' 13.1491" E
11	BP11	12° 34' 03.8746" N	77° 52' 14.3882" E
12	BP12	12° 34' 03.4026" N	77° 52' 16.1773" E
13	BP13	12° 34' 03.6407" N	77° 52' 17.1403" E
14	BP14	12° 34' 03.1239" N	77° 52' 19.4995" E
15	BP15	12° 33' 49.3614" N	77° 52' 19.3373" E
16	BP16	12° 33' 46.0436" N	77° 52' 16.5917" E
17	BP17	12° 33' 45.0271" N	77° 52' 16.5403" E
18	BP18	12° 33' 41.5912" N	77° 52' 10.0625" E
19	BP19	12° 33' 41.7218" N	77° 52' 16.6294" E
20	BP20	12° 33' 40.0403" N	77° 52' 20.5725" E
21	BP21	12° 33' 38.7676" N	77° 52' 20.6766" E
22	BP22	12° 33' 37.9853" N	77° 52' 19.8814" E
23	BP23	12° 33' 35.0350" N	77° 52' 17.7081" E
24	BP24	12° 33' 37.7476" N	77° 52' 10.5637" E
25	BP25	12° 33' 39.2893" N	77° 52' 09.9043" E

DISTRICT : KRISHNAGIRI

TALUK : DENKANIKOTTAI

VILLAGE NAME : JAKKERY

VILLAGE NO. : 65

FIELD NOs. : 486/Part & 736/4

LEASE HOLD AREA : 22.40.0Ha.(486/Part)
4.64.5Ha.(736/4)

TOTAL : 27.04.5Ha.

PLATE No. 1a

JAKKERY COLOUR GRANITE QUARRY

LEASE PLAN

MINING PLAN

20 0 100 200

SCALE= 1:2,000(1CM = 20 M)

ALL DIMENSIONS ARE IN METRES

APPLICANT : ---

M/S.TAMILNADU MINERALS LIMITED
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

77° 52' 04.4577" | 77° 52' 20.6766"

811500 E | 811600 E | 811700 E | 811800 E | 811900 E | 812000 E | 812100 E | 812200 E | 812300 E

1391300 N | 1391200 N | 1391100 N | 1391000 N | 1390900 N | 1390800 N | 1390700 N | 1390600 N | 1390500 N | 1390400 N | 1390300 N | 1390200 N | 1390100 N | 1390000 N

12° 34' 03.4026"

12° 33' 35.0350"

N

TO Kelammangalam

TO Anusonai

TO Pachappanatty

478 | 479 | 484 | 485 | 719 | 487 | 488 | 489 | 387 | 359 | 347(Part) | 736/2 | 736/3 | 738 | 737

486(Part) Govt.Poramboke Land

Govt.Poramboke Land

Private Farm House

Tiled House

Nagalingeswara Temple

Water Tank

Temple

Karudakkambam 910.4556

First Aid Station

Mines Office

Rest Shed

Private Colour Granite Quarry

GATE

Vill. No.66 PACHAPANATTI

Asbestos House

Well

Patta Land

Refilled Area

House

Water Tank

Over head Water Tank

Panjhayat Motor Room

Shed

ERI

BP1 | BP2 | BP3 | BP4 | BP5 | BP6 | BP7 | BP8 | BP9 | BP10 | BP11 | BP12 | BP13 | BP14 | BP15 | BP16 | BP17 | BP18 | BP19 | BP20 | BP21 | BP22 | BP23 | BP24 | BP25

LEGEND

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	NATIONAL GRID WITH VALUES	
3.	VILLAGE ROAD	
4.	MINES APPROACH ROAD	
5.	TEMPORARY SHED	
6.	BENCH MARK	B.M.776.669
7.	CONTOUR AT 10M INTERVAL	830 / 840
8.	OPENCAST OLD WORKING PIT	
9.	OLD WASTE DUMP	
10.	PINK MIGMATITE PARADISO DEPOSIT	
11.	SAFETY DISTANCE 7.5M FROM PATTA LAND ON NORTH OF S.F.No.736/4. 10.0 M FROM PROMPOKE LAND 50.0M FROM KARUDAKKAMBAM, IN S.F.No.486(P) 50.0M FROM NAGALINGESWARA TEMPLE AND HOUSES IN EASTERN BOUNDARY OF S.F.No.486(P) 50.0M FROM E.B LINE AND HOUSES EAST OF S.F.No.736/4.	
12.	OLD STOCK YARD	
13.	ELECTRIC POWER LINE	
14.	BOUNDARY CORNER PILLAR	BP1-25

DGPS CO-ORDINATES

Sl.No	Boundary Pillar No	Latitude	Longitude
1	BP1	12° 33' 43.1600" N	77° 52' 12.9811" E
2	BP2	12° 33' 43.0346" N	77° 52' 11.1318" E
3	BP3	12° 33' 43.3031" N	77° 52' 08.4746" E
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15	BP15	12° 33' 49.3614" N	77° 52' 19.3373" E
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17	BP17	12° 33' 45.0271" N	77° 52' 16.5403" E
18	BP18	12° 33' 41.5912" N	77° 52' 10.0625" E
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25	BP25	12° 33' 39.2893" N	77° 52' 09.9043" E

DISTRICT : KRISHNAGIRI

TALUK : DENKANIKOTTAI

VILLAGE NAME : JAKKERY

VILLAGE NO. : 65

FIELD NOs. : 486/Part & 736/4

LEASE HOLD AREA : 22.40.0Ha.(486/Part)
4.64.5Ha.(736/4)

TOTAL : 27.04.5Ha.

PLATE No. 2

JAKKERY COLOUR GRANITE QUARRY
MINES SURFACE PLAN
MINING PLAN

20 0 100 200

SCALE= 1:2,000(1CM = 20 M)

ALL DIMENSIONS ARE IN METRES

APPLICANT : ---

M/S.TAMILNADU MINERALS LIMITED
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

77° 52' 04.4577" 77° 52' 20.6766"

811500 E 811600 E 811700 E 811800 E 811900 E 812000 E 812100 E 812200 E 812300 E

1391300 N 1391200 N 1391100 N 1391000 N 1390900 N 1390800 N 1390700 N 1390600 N 1390500 N 1390400 N 1390300 N 1390200 N 1390100 N 1390000 N

12° 34' 03.4026" 12° 33' 35.0350"

N

TO Kelamangalam

TO Anusonai

TO Pachappanatty

478 479 484 485 486(Part) Govt.Poramboke Land 487 488 489 719 359 Govt.Poramboke Land 387

736/2 Patta Land 736/3 Patta Land 736/4 738 Patta Land 737 Govt.Poramboke Land

347(Part) Govt.Poramboke Land Vill. No.66 PACHAPANATTI

347(Part) Govt.Poramboke Land

BP1 BP2 BP3 BP4 BP5 BP6 BP7 BP8 BP9 BP10 BP11 BP12 BP13 BP14 BP15 BP16 BP17 BP18 BP19 BP20 BP21 BP22 BP23 BP24 BP25

A B C D E F G H J K R

Karudakkambam 910.4556

Private Farm House

Private Colour Granite Quarry

Nagalingeswara Temple

Tiled House

Water Tank

First Aid Station

Mines Office

Rest Shed

Asbestos House

Well

Over head Water Tank

House

Water Tank

House

Tiled House

Panjhayat Motor Room

Tiled House

Tiled House

Shed

Tiled House

ERI

Refilled Area

GATE

15°

LEGEND

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	NATIONAL GRID WITH VALUES	
3.	VILLAGE ROAD	
4.	MINES APPROACH ROAD	
5.	TEMPORARY SHED	
6.	BENCH MARK	B.M.776.669
7.	CONTOUR AT 10M INTERVAL	830 840
8.	OPENCAST OLD WORKING PIT	
9.	OLD WASTE DUMP	
10.	PINK MIGMATITE PARADISO DEPOSIT	
11.	GREY MIGMATITE	
12.	DIP AND STRIKE	15°
13.	SAFETY DISTANCE 7.5M FROM PATTA LAND ON NORTH OF S.F.No.736/4. 10.0 M FROM PROMPOKE LAND 50.0M FROM KARUDAKKAMBAM, IN S.F.No.486(P) 50.0M FROM NAGALINGESWARA BOUNDARY OF S.F.No.486(P) TEMPLE AND HOUSES IN EASTERN EAST OF S.F.No.736/4. 50.0M FROM E.B.LINE AND HOUSES	
14.	OLD STOCK YARD	
15.	ELECTRIC POWER LINE	
16.	BOUNDARY CORNER PILLAR	BP1-25

DISTRICT : KRISHNAGIRI

TALUK : DENKANIKOTTAI

VILLAGE NAME : JAKKERY

VILLAGE NO. : 65

FIELD NOs. : 486/Part & 736/4

LEASE HOLD AREA : 22.40.0Ha.(486/Part)
4.64.5Ha.(736/4)

TOTAL : 27.04.5Ha.

PLATE No. 3

JAKKERY COLOUR GRANITE QUARRY
MINES GEOLOGICAL PLAN
MINING PLAN

20 0 100 200

SCALE= 1:2,000(1CM = 20 M)

ALL DIMENSIONS ARE IN METRES

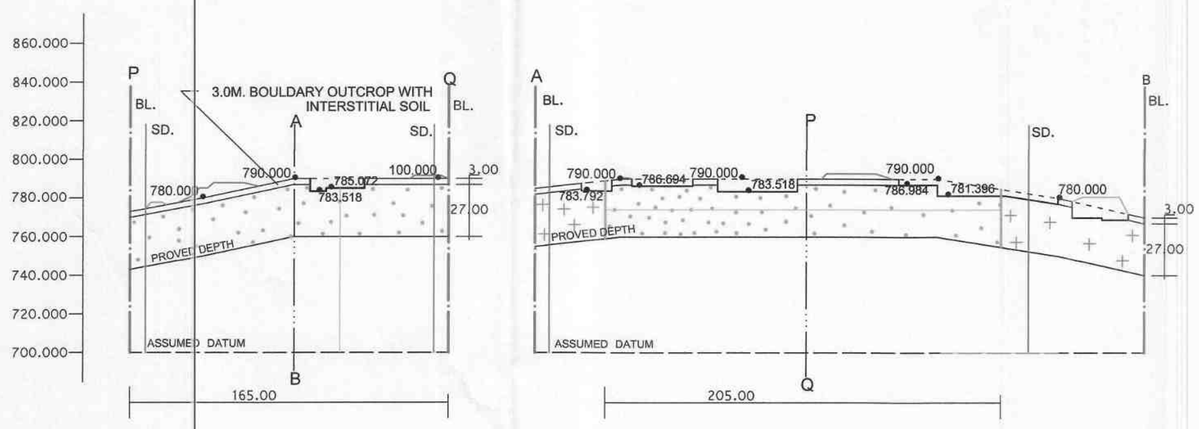
APPLICANT : ---

M/S.TAMILNADU MINERALS LIMITED
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

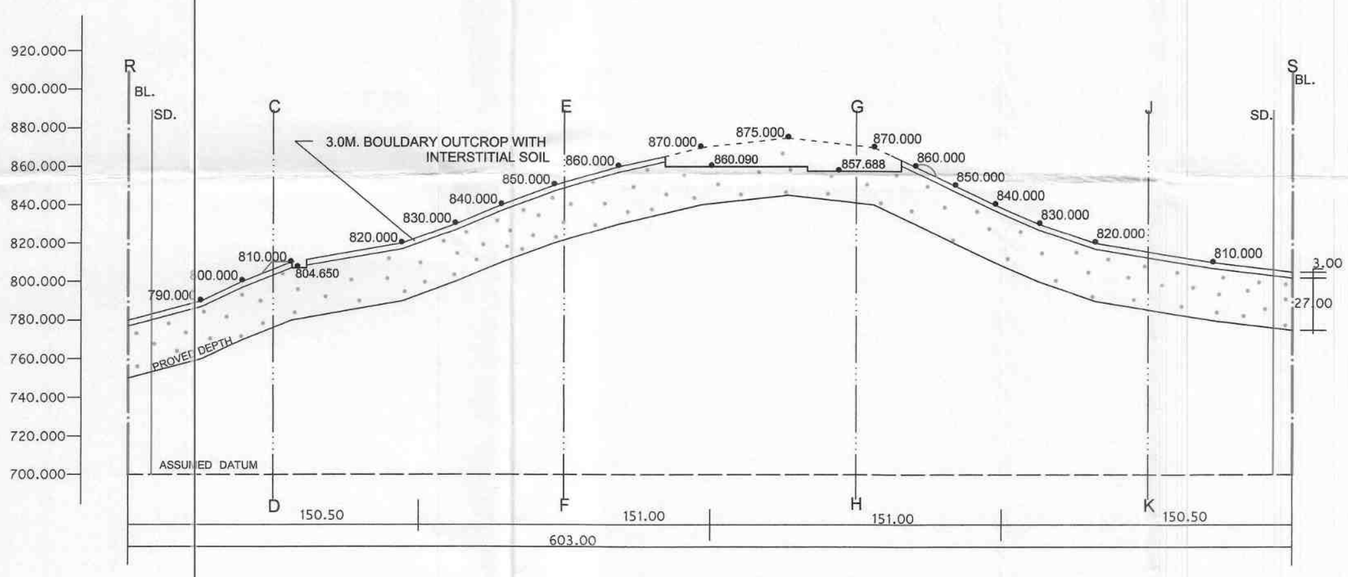
M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.



LONGITUDINAL SECTION ON PQ

CROSS SECTION ON-AB



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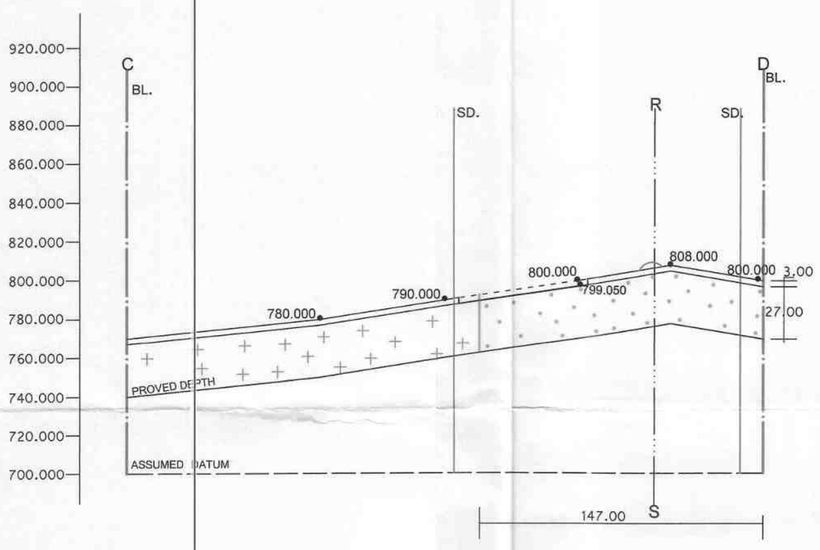

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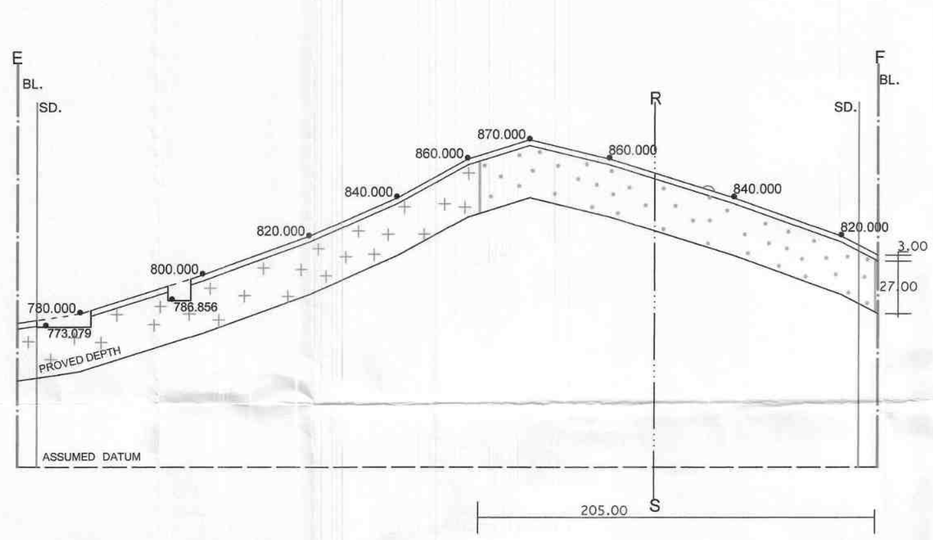
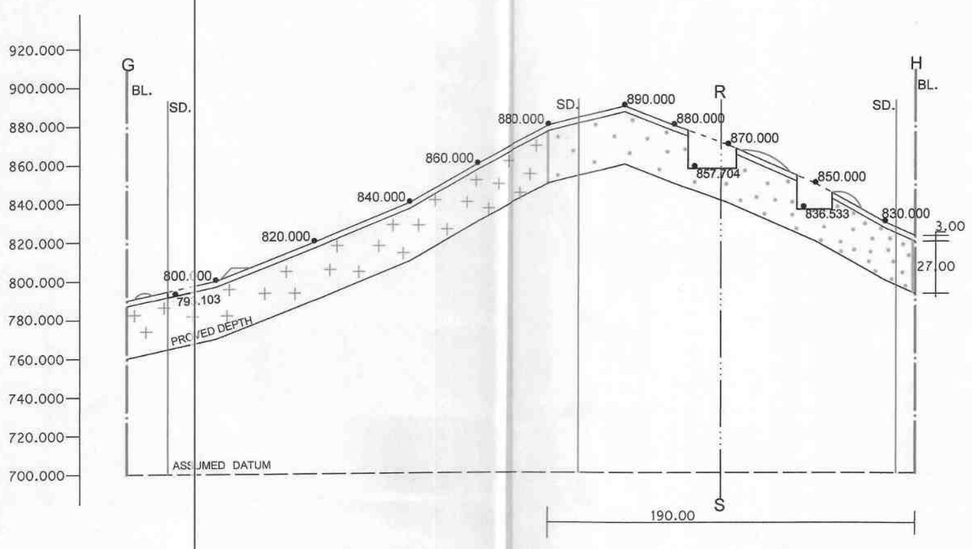
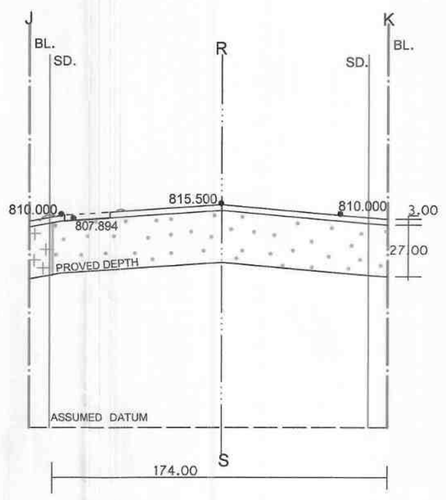


CROSS SECTION ON-EF



CROSS SECTION ON-GH



CROSS SECTION ON-JK

LEGEND

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	OPENCAST OLD WORKING PIT	
3.	OLD WASTE DUMP	
4.	PINK MIGMATITE PARADISO DEPOSIT	
5.	GREY MIGMATITE	
6.	SAFETY DISTANCE 7.5M FROM PATTA LAND ON NORTH OF S.F.No.736/4. 10.0 M FROM PROMPOKE LAND 50.0M FROM KARUDAKKAMBAM, IN S.F.No.486(P) 50.0M FROM NAGALINGESWARA TEMPLE AND HOUSES IN EASTERN BOUNDARY OF S.F.No.486(P) 50.0M FROM E.B LINE AND HOUSES EAST OF S.F.No.736/4.	
7.	3.0M. BOULDARY OUTCROP WITH INTERSTITIAL SOIL	

DISTRICT : KRISHNAGIRI

TALUK : DENKANIKOTTAI

VILLAGE NAME : JAKKERY

VILLAGE NO. : 65

FIELD NOs. : 486/Part & 736/4

LEASE HOLD AREA : 22.40.0Ha.(486/Part)
4.64.5Ha.(736/4)

TOTAL : 27.04.5Ha.

PLATE No. 3a

JAKKERY COLOUR GRANITE QUARRY
MINES GEOLOGICAL SECTIONS
MINING PLAN

20 0 100 200

SCALE= 1:2,000(1CM = 20 M)

ALL DIMENSIONS ARE IN METRES

APPLICANT : ---

M/S.TAMILNADU MINERALS LIMITED
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

77° 52' 04.4577"

77° 52' 20.6766"

811500 E | 811600 E | 811700 E | 811800 E | 811900 E | 812000 E | 812100 E | 812200 E | 812300 E

1391300 N | 1391200 N | 1391100 N | 1391000 N | 1390900 N | 1390800 N | 1390700 N | 1390600 N | 1390500 N | 1390400 N | 1390300 N | 1390200 N | 1390100 N | 1390000 N

12° 34' 03.4026"

12° 33' 35.0350"

N

TO Kelamangalam

TO Anusonai

TO Pachappanatty

478 | 479 | 484 | 485 | 486(Part) Govt.Poramboke Land | 487 | 488 | 489 | 719 | 387 | 359 Govt.Poramboke Land | 347(Part) Govt.Poramboke Land | 736/2 Patta Land | 736/3 Patta Land | 736/4 | 738 Patta Land | 737 Govt.Poramboke Land | 347(Part) Govt.Poramboke Land | 347(Part) Govt.Poramboke Land

BP1 | BP2 | BP3 | BP4 | BP5 | BP6 | BP7 | BP8 | BP9 | BP10 | BP11 | BP12 | BP13 | BP14 | BP15 | BP16 | BP17 | BP18 | BP19 | BP20 | BP21 | BP22 | BP23 | BP24 | BP25

Karudakkambam 910.4556

Private Farm House | Tiled House | Nagalingeswara Temple | Water Tank | Temple | First Aid Station | Mines Office | Rest Shed | Rest Shed | Private Colour Granite Quarry | GATE | Asbestos House | Well | House | Water Tank | House | Over head Water Tank | Refilled Area | Tiled House | Panjhayat Motor Room | Tiled House | Shed | Tiled House | Tiled House | ERI

LEGEND

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	NATIONAL GRID WITH VALUES	
3.	VILLAGE ROAD	
4.	MINES APPROACH ROAD	
5.	TEMPORARY SHED	
6.	BENCH MARK	B.M.776.669
7.	CONTOUR AT 10M INTERVAL	830 / 840
8.	OPENCAST OLD WORKING PIT	
9.	OLD WASTE DUMP	
10.	PINK MIGMATITE PARADISO DEPOSIT	
11.	SAFETY DISTANCE 7.5M FROM PATTA LAND ON NORTH OF S.F.No.736/4. 10.0 M FROM PROMPOKE LAND 50.0M FROM KARUDAKKAMBAM, IN S.F.No.486(P) 50.0M FROM NAGALINGESWARA TEMPLE AND HOUSES IN EASTERN BOUNDARY OF S.F.No.486(P) 50.0M FROM E.B LINE AND HOUSES EAST OF S.F.No.736/4.	
12.	OLD STOCK YARD	
13.	ELECTRIC POWER LINE	
14.	BOUNDARY CORNER PILLAR	BP1-25
15.	WASTE DUMP (RROPOSED)	

PRODUCTION/DEVELOPMENT

- FOR THE FIRST YEAR
- FOR THE SECOND YEAR
- FOR THE THIRD YEAR
- FOR THE FOURTH YEAR
- FOR THE FIFTH YEAR

DISTRICT	:	KRISHNAGIRI
TALUK	:	DENKANIKOTTAI
VILLAGE NAME	:	JAKKERY
VILLAGE NO.	:	65
FIELD NOs.	:	486/Part & 736/4
LEASE HOLD AREA	:	22.40.0Ha.(486/Part) 4.64.5Ha.(736/4)
TOTAL	:	27.04.5Ha.

PLATE No. 4

JAKKERY COLOUR GRANITE QUARRY
YEARWISE PRODUCTION/DEVELOPMENT
PLAN FOR FIVE YEARS
MINING PLAN

20 0 100 200

SCALE= 1:2,000(1CM = 20 M)

ALL DIMENSIONS ARE IN METRES

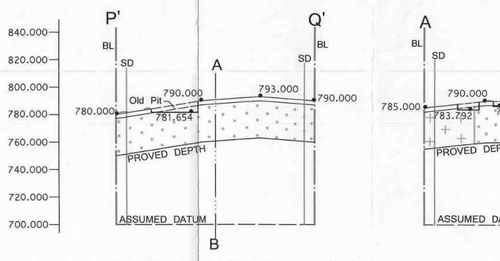
APPLICANT : ---

M/s.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

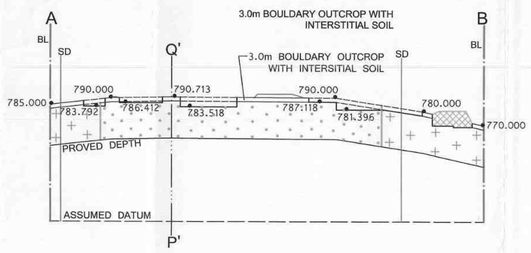
Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

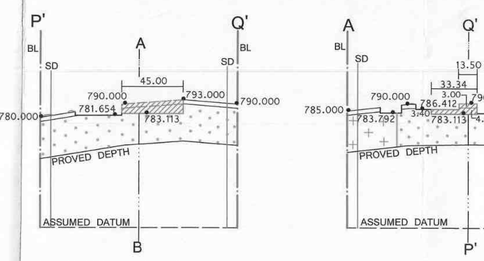


LONGITUDINAL SECTION ON : P'-Q'

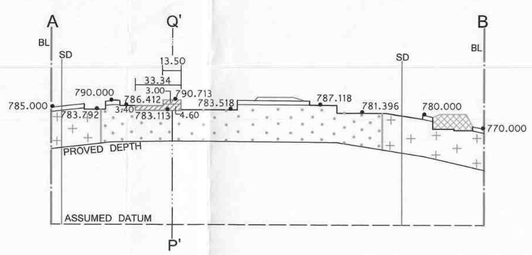


CROSS SECTION ON : A-B

PIT AT THE BEGINING OF THE FIRST YEAR

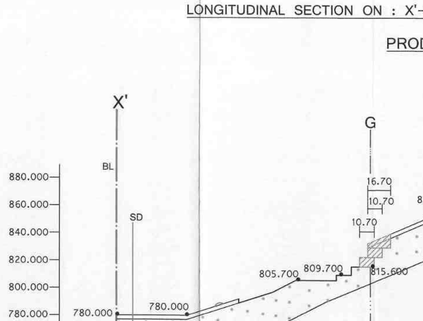


LONGITUDINAL SECTION ON : P'-Q'

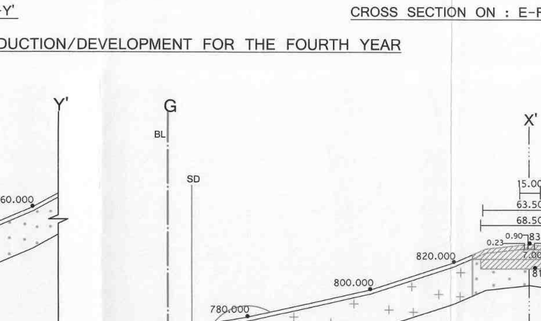


CROSS SECTION ON : A-B

PRODUCTION/DEVELOPMENT FOR THE FIRST YEAR

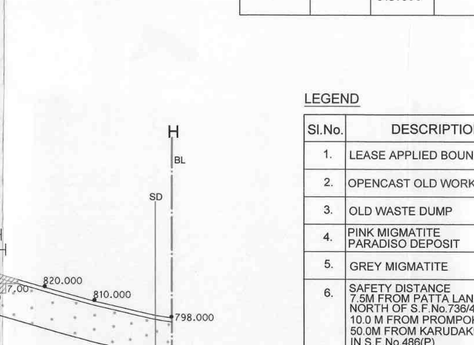


LONGITUDINAL SECTION ON : R'-S'

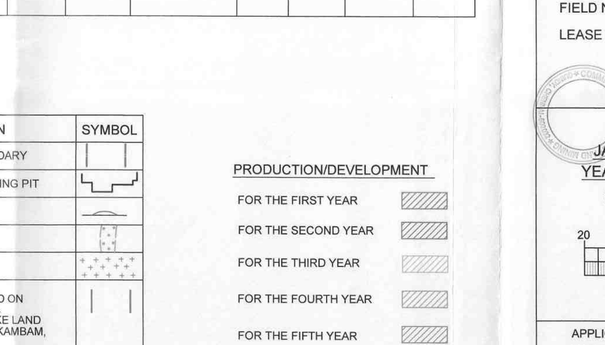


CROSS SECTION ON : A-B

PRODUCTION/DEVELOPMENT FOR THE SECOND YEAR

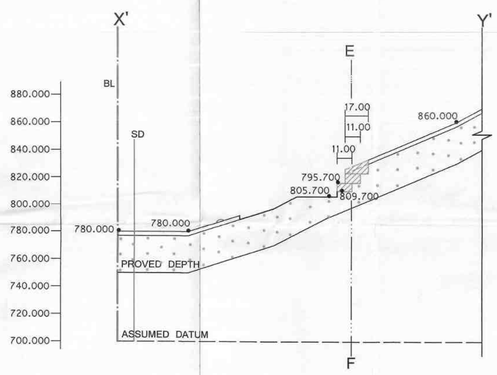


LONGITUDINAL SECTION ON : X'-Y'

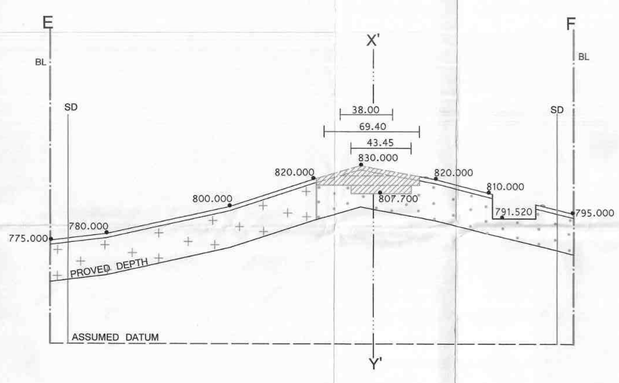


CROSS SECTION ON : C-D

PRODUCTION/DEVELOPMENT FOR THE THIRD YEAR



LONGITUDINAL SECTION ON : X'-Y'



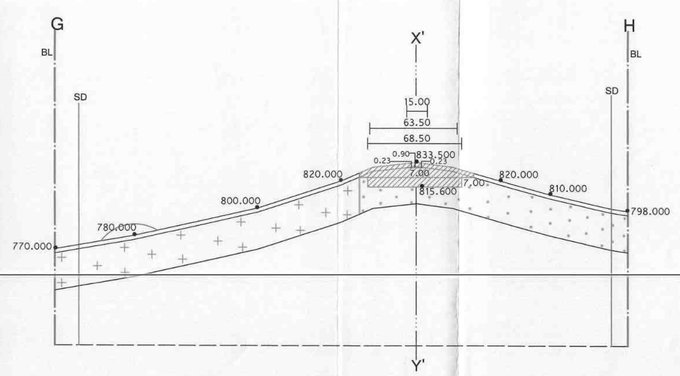
CROSS SECTION ON : E-F

PRODUCTION/DEVELOPMENT FOR THE FOURTH YEAR

DETAILS OF DEPTH, BENCH AND PRODUCTION FOR MINING PLAN PERIOD

YEAR	Section	RL	Details of Depth (Average Measurements in M)				No.Of Benchs Proposed	Proposed ROM in Cu.M.	Proposed Salable CG @ 25% in Cu.M.	Proposed Salable CG Waste @ 75% in Cu.M.
			Present	Proposed	Remaining	Total (Ultimate depth)				
Ist YEAR	P'-Q' & AB	790.713 TO 783.113	0	7.60	22.40	30.00	1	6001	1500	4501
IInd YEAR	R'-S' & AB	781.396 TO 776.996	7.25	4.40	18.35	30.00	1	7202	1800	5402
IIIrd YEAR	X'-Y' & CD	822.000 TO 805.700	0	16.30	13.70	30.00	2	8800	2200	6600
IVth YEAR	X'-Y' & EF	830.000 TO 809.700	0	20.30	9.70	30.00	3	9600	2400	7200
Vth YEAR	X'-Y' & GH	833.500 TO 815.600	0	17.90	12.10	30.00	3	10000	2500	7500

LONGITUDINAL SECTION ON : X'-Y'



CROSS SECTION ON : G-H

PRODUCTION/DEVELOPMENT FOR THE FIFTH YEAR

LEGEND

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	OPENCAST OLD WORKING PIT	
3.	OLD WASTE DUMP	
4.	PINK MIGMATITE PARADISO DEPOSIT	
5.	GREY MIGMATITE	
6.	SAFETY DISTANCE 7.5M FROM PATTA LAND ON NORTH OF S.F.No.736/4. 10.0 M FROM PROMPOKE LAND 50.0M FROM KARUDAKKAMBAM, IN S.F.No.486(P) 50.0M FROM NAGALINGESWARA TEMPLE AND HOUSES IN EASTERN BOUNDARY OF S.F.No.486(P)	
	50.0M FROM E.B LINE AND HOUSES EAST OF S.F.No.736/4.	
7.	3.0M. BOULDARY OUTCROP WITH INTERSTITIAL SOIL	

PRODUCTION/DEVELOPMENT

- FOR THE FIRST YEAR
- FOR THE SECOND YEAR
- FOR THE THIRD YEAR
- FOR THE FOURTH YEAR
- FOR THE FIFTH YEAR

DISTRICT	:	KRISHNAGIRI
TALUK	:	DENKANIKOTTAI
VILLAGE NAME	:	JAKKERY
VILLAGE NO.	:	65
FIELD NOs.	:	486/Part & 736/4
LEASE HOLD AREA	:	22.40.0Ha.(486/Part) 4.64.5Ha.(736/4)
TOTAL	:	27.04.5Ha.

PLATE No. 4a

JAKKERY COLOUR GRANITE QUARRY

YEARWISE PRODUCTION/DEVELOPMENT SECTIONS FOR FIVE YEARS

MINING PLAN

20 0 100 200

SCALE= 1:2,000(1CM = 20 M)

ALL DIMENSIONS ARE IN METRES

APPLICANT : —

M/s.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

77° 52' 04.4577" | 77° 52' 20.6766"

811500 E | 811600 E | 811700 E | 811800 E | 811900 E | 812000 E | 812100 E | 812200 E | 812300 E

1391300 N | 1391200 N | 1391100 N | 1391000 N | 1390900 N | 1390800 N | 1390700 N | 1390600 N | 1390500 N | 1390400 N | 1390300 N | 1390200 N | 1390100 N | 1390000 N

12° 34' 03.4026"

N

TO Kelamangalam

TO Anusonai

TO Pachappanatty

478 | 479 | 484 | 485 | 487 | 488 | 489 | 719 | 387 | 359 | 738 | 737

486(Part) Govt.Poramboke Land

347(Part) Govt.Poramboke Land

736/2 Patta Land

736/3 Patta Land

736/4

738 Patta Land

BP1 BP2 BP3 BP4 BP5 BP6 BP7 BP8 BP9 BP10 BP11 BP12 BP13 BP14 BP15 BP16 BP17 BP18 BP19 BP20 BP21 BP22 BP23 BP24 BP25

Karudakkambam 910.4556

Private Farm House

Tiled House

Nagalingeswara Temple

Water Tank

Temple

First Aid Station

Rest Shed

Mines Office

Private Colour Granite Quarry

GATE

Asbestos House

Well

House

Water Tank

Over head Water Tank

Refilled Area

Panjhayat Motor Room

Shed

ERI

12° 33' 35.0350"

LEGEND

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	NATIONAL GRID WITH VALUES	
3.	VILLAGE ROAD	
4.	MINES APPROACH ROAD	
5.	TEMPORARY SHED	
6.	BENCH MARK	B.M.776.669
7.	CONTOUR AT 10M INTERVAL	830 / 840
8.	OPENCAST OLD WORKING PIT	
9.	OLD WASTE DUMP	
10.	PINK MIGMATITE PARADISO DEPOSIT	
11.	SAFETY DISTANCE 7.5M FROM PATTA LAND ON NORTH OF S.F.No.736/4. 10.0 M FROM PROMPOKE LAND 50.0M FROM KARUDAKKAMBAM, IN S.F.No.486(P) 50.0M FROM NAGALINGESWARA TEMPLE AND HOUSES IN EASTERN BOUNDARY OF S.F.No.486(P) 50.0M FROM E.B LINE AND HOUSES EAST OF S.F.No.736/4.	
12.	OLD STOCK YARD	
13.	ELECTRIC POWER LINE	
14.	BOUNDARY CORNER PILLAR	BP1-25
15.	WASTE DUMP (RROPOSED)	
16.	PIT AT END OF MINING PLAN PERIOD	

AFFORESTION DETAILS

EXISTING PLANTS

FIRST YEAR - 30 - PLANTS IN 0.02.0Ha 20% SURVIVAL

SECOND YEAR-30 - PLANTS IN 0.02.0Ha 20% SURVIVAL

THIRD YEAR - 30 - PLANTS IN 0.02.0Ha 20% SURVIVAL

FOURTH YEAR- 30 - PLANTS IN 0.02.0Ha 20% SURVIVAL

FIFTH YEAR - 30 - PLANTS IN 0.02.0Ha 20% SURVIVAL

DISTRICT	:	KRISHNAGIRI
TALUK	:	DENKANIKOTTAI
VILLAGE NAME	:	JAKKERY
VILLAGE NO.	:	65
FIELD NOs.	:	486/Part & 736/4
LEASE HOLD AREA	:	22.40.0Ha.(486/Part)
		4.64.5Ha.(736/4)
TOTAL	:	27.04.5Ha.

PLATE No. 5

JAKKERY COLOUR GRANITE QUARRY
LANDUSE AND AFFORESTATION PLAN
MINING PLAN

20 0 100 200

SCALE= 1:2,000(1CM = 20 M)

ALL DIMENSIONS ARE IN METRES

APPLICANT : ---

M/S.TAMILNADU MINERALS LIMITED
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789,
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

77° 52' 04.4577"

77° 52' 20.6766"

811500 E | 811600 E | 811700 E | 811800 E | 811900 E | 812000 E | 812100 E | 812200 E | 812300 E

1391300 N | 1391200 N | 1391100 N | 1391000 N | 1390900 N | 1390800 N | 1390700 N | 1390600 N | 1390500 N | 1390400 N | 1390300 N | 1390200 N | 1390100 N | 1390000 N

12° 34' 03.4026"

12° 33' 35.0350"

N

TO Kelamangalam

TO Anusonai

TO Pachappanatty

478 | 479 | 484 | 485 | 487 | 488 | 489 | 719

486(Part) Govt.Porambokе Land

347(Part) Govt.Porambokе Land

736/2 Patta Land

736/3 Patta Land

736/4

738 Patta Land

359 Govt.Porambokе Land

737 Govt.Porambokе Land

Private Farm House

Tiled House

Arulmigu Eswara Temple

Water Tank

Karudakkambam 910.4556

Private Colour Granite Quarry

GATE

First Aid Station

Mines Office

Rest Shed

Asbestos House

Well

Over head Water Tank

House

Water Tank

House

Refilled Area

Tiled House

Panjhayat Motor Room

Tiled House

Tiled House

Shed

Tiled House

ERI

Vill. No.66 PACHAPANATTI

BP1 BP2 BP3 BP4 BP5 BP6 BP7 BP8 BP9 BP10 BP11 BP12 BP13 BP14 BP15 BP16 BP17 BP18 BP19 BP20 BP21 BP22 BP23 BP24 BP25

A B C D E F G H J K P Q R

LEGEND

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	NATIONAL GRID WITH VALUES	
3.	VILLAGE ROAD	
4.	MINES APPROACH ROAD	
5.	TEMPORARY SHED	
6.	BENCH MARK	B.M.776.669
7.	CONTOUR AT 10M INTERVAL	830 / 840
8.	OPENCAST OLD WORKING PIT	
9.	OLD WASTE DUMP	
10.	PINK MIGMATITE PARADISO DEPOSIT	
11.	GREY MIGMATITE	
12.	3.0M BOULDARY OUTCROP WITH INTERSITITIAL SOIL	
13.	DIP AND STRIKE	
14.	SAFETY DISTANCE 7.5M FROM PATTA LAND ON NORTH OF S.F.No.736/4. 10.0 M FROM PROMPOKE LAND 50.0M FROM KARUDAKKAMBAM, IN S.F.No.486(P) 50.0M FROM NAGALINGESWARA TEMPLE AND HOUSES IN EASTERN BOUNDARY OF S.F.No.486(P) 50.0M FROM E.B LINE AND HOUSES EAST OF S.F.No.736/4.	
12.	OLD STOCK YARD	
13.	ELECTRIC POWER LINE	
14.	BOUNDARY CORNER PILLER	BP1-25
15.	WASTE DUMP (RROPOSED)	
16.	ULTIMATE PIT LIMIT	
17.	PIT AT END OF MINING PLAN PERIOD	

DISTRICT : KRISHNAGIRI

TALUK : DENKANIKOTTAI

VILLAGE NAME : JAKKERY

VILLAGE NO. : 65

FIELD NOs. : 486/Part & 736/4

LEASE HOLD AREA : 22.40.0Ha.(486/Part)
4.64.5Ha.(736/4)

TOTAL : 27.04.5Ha.

PLATE No. 6

JAKKERY COLOUR GRANITE QUARRY
MINES CONCEPTUAL PLAN
MINING PLAN

20 0 100 200

SCALE= 1:2,000(1CM = 20 M)

ALL DIMENSIONS ARE IN METRES

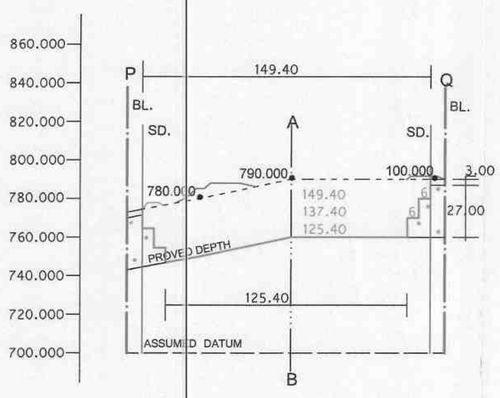
APPLICANT : ---

M/S.TAMILNADU MINERALS LIMITED
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

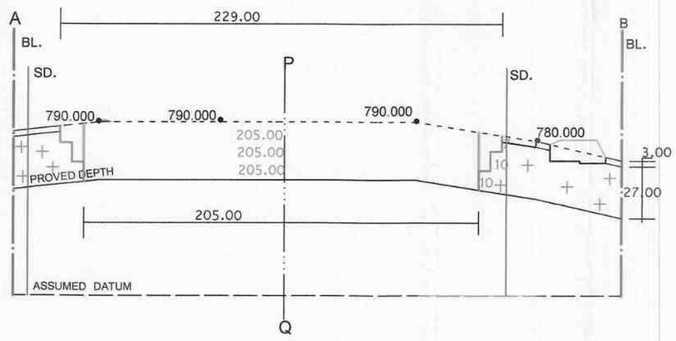
Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

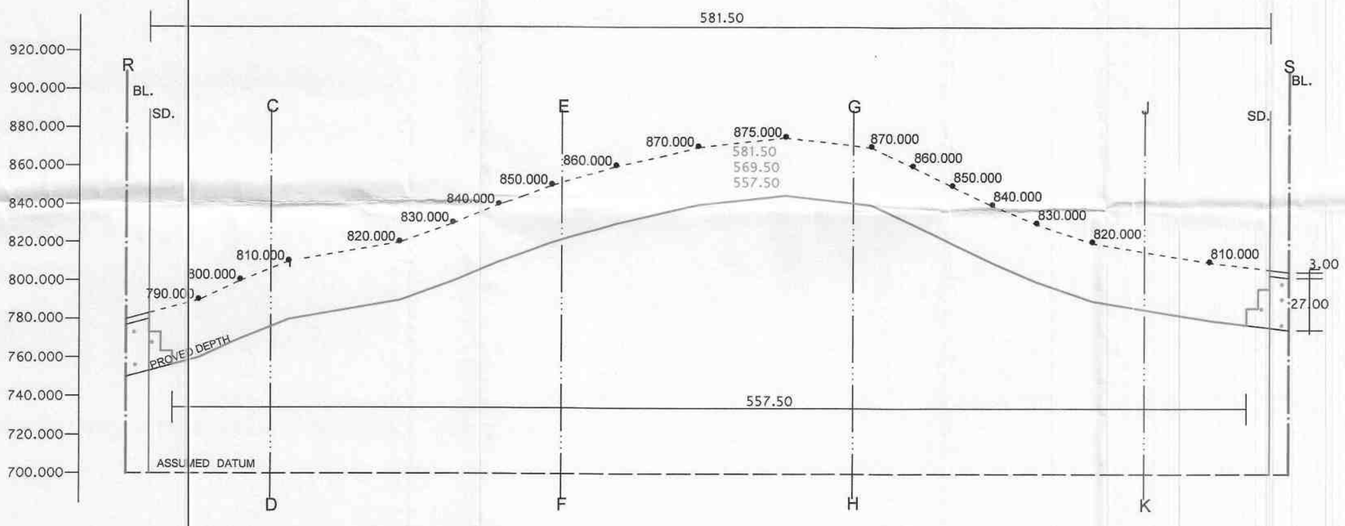
Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.



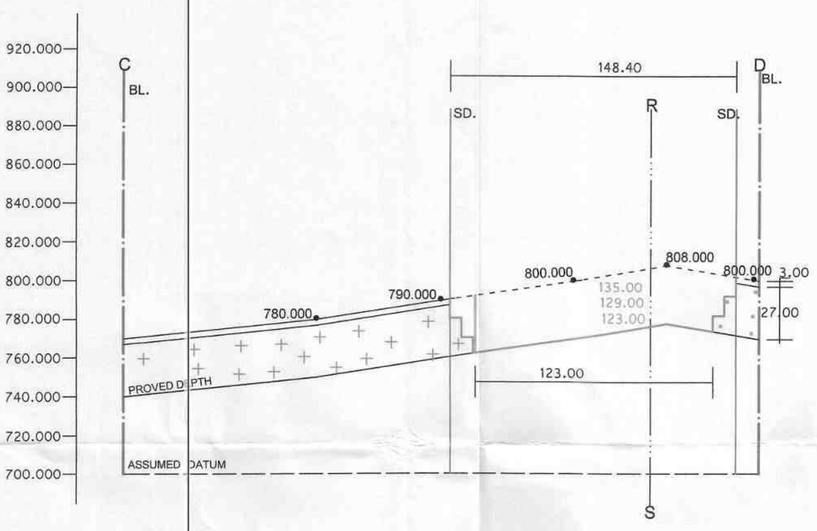
LONGITUDINAL SECTION ON PQ



CROSS SECTION ON-AB



LONGITUDINAL SECTION ON-RS



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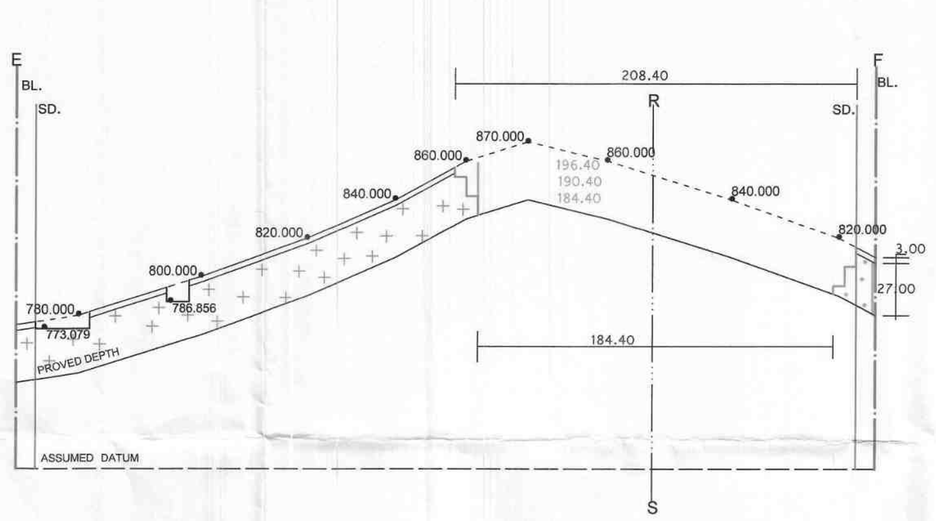
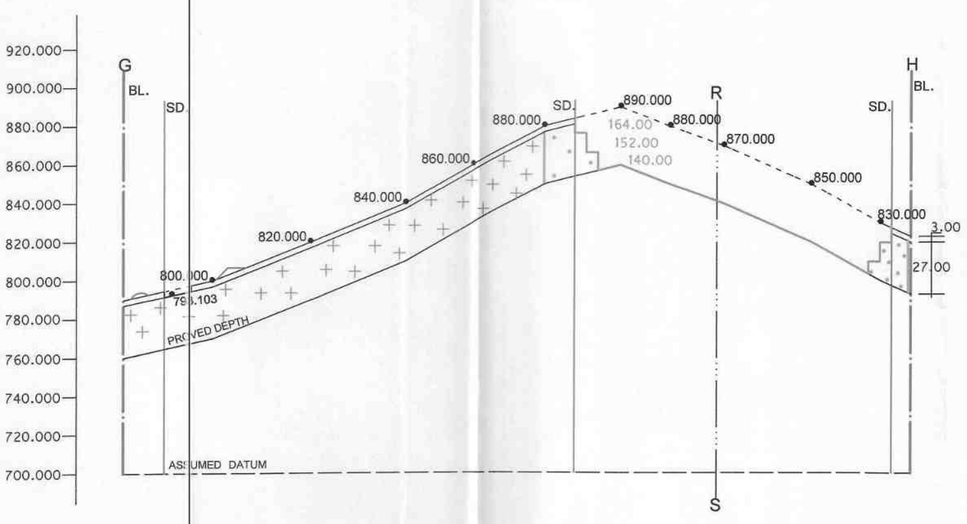
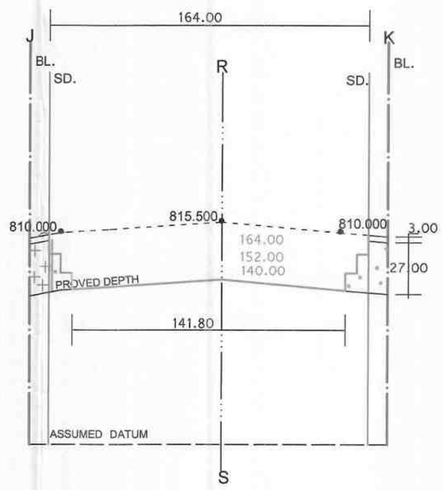


CROSS SECTION ON-EF



CROSS SECTION ON-GH



CROSS SECTION ON-JK

LEGEND

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	OPENCAST OLD WORKING PIT	
3.	OLD WASTE DUMP	
4.	PINK MIGMATITE PARADISO DEPOSIT	
5.	GREY MIGMATITE	
6.	SAFETY DISTANCE 7.5M FROM PATTA LAND ON NORTH OF S.F.No.736/4. 10.0 M FROM PROMPOKE LAND 50.0M FROM KARUDAKKAMBAM, IN S.F.No.486(P) 50.0M FROM NAGALINGESWARA TEMPLE AND HOUSES IN EASTERN BOUNDARY OF S.F.No.486(P) 50.0M FROM E.B LINE AND HOUSES EAST OF S.F.No.736/4.	
7.	3.0M. BOULDARY OUTCROP WITH INTERSTITIAL SOIL	
	WASTE DUMP (RROPOSED)	
	ULTIMATE PIT LIMIT	

ULTIMATE PIT DIMENSION

Sl.No.	Sf.No.	Section on	Detail	Ave.Length in M	Ave.Width in M	Depth in M
1.	736/4	PQ & AB	Top bench	149.00	229.00	30.00
			Bottom bench	125.00	205.00	
2.	486/Part	RS & CE,EF,GE, JK	Top bench	581.50	172.00	30.00
			Bottom bench	557.50	147.00	

DISTRICT : KRISHNAGIRI

TALUK : DENKANIKOTTAI

VILLAGE NAME : JAKKERY

VILLAGE NO. : 65

FIELD NOs. : 486/Part & 736/4

LEASE HOLD AREA : 22.40.0Ha.(486/Part)
4.64.5Ha.(736/4)

TOTAL : 27.04.5Ha.

PLATE No. 6a

JAKKERY COLOUR GRANITE QUARRY
MINES CONCEPTUAL SECTIONS

MINING PLAN

20 0 100 200

SCALE= 1:2,000(1CM = 20 M)

ALL DIMENSIONS ARE IN METRES

APPLICANT : ---

M/S.TAMILNADU MINERALS LIMITED
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

77° 52' 04.4577" 77° 52' 20.6766"

12° 34' 03.4026"

12° 33' 35.0350"

N

VILL.NO-65
JAKKERY

486/Part

486(PART)

736/Part

736/4

VILL.NO-66
PACHAPANATTI

Sanathkumara Nadi

LEGEND

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	VILLAGE ROAD	
3.	CART TRACK	
4.	BUFFER ZONE 500m RADIUS	
5.	ERI	
6.	STREAM	
7.	WELL	
8.	VILLAGE BOUNDARY	
9.	SAFETY ZONE 60m AROUND THE BOUNDARY	
10.	SURVEY FIELD No.	486/P& 736/4
11.	RESIDENTIAL AREA	

DISTRICT : KRISHNAGIRI

TALUK : DENKANIKOTTAI

VILLAGE NAME : JAKKERY

VILLAGE NO. : 65

FIELD NOs. : 486/Part & 736/4

LEASE HOLD AREA : 22-40.0Ha.(486/Part)
4-64.5Ha.(736/4)

TOTAL : 27-04.5Ha.

PLATE No.7

JAKKERY COLOUR GRANITE QUARRY
MINING PLAN
ENVIRONMENT PLAN

50 0 250 500

SCALE = 1 : 5000 (1Cm=5mts)
ALL DIMENSIONS ARE IN METRES

APPLICANT : M/s.TAMILNADU MINERALS LIMITED,
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

Certified that the PLAN is Correct

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

77° 52' 04.4577" | 77° 52' 20.6766"

811500 E | 811600 E | 811700 E | 811800 E | 811900 E | 812000 E | 812100 E | 812200 E | 812300 E

1391300 N | 1391200 N | 1391100 N | 1391000 N | 1390900 N | 1390800 N | 1390700 N | 1390600 N | 1390500 N | 1390400 N | 1390300 N | 1390200 N | 1390100 N | 1390000 N

12° 34' 03.4026"

12° 33' 35.0350"

N

TO Kelamangalam

TO Anusonai

TO Pachappanatty

478 | 479 | 484 | 485 | 487 | 488 | 489 | 719 | 387 | 359 | 347(Part) | 736/2 | 736/3 | 736/4 | 738 | 737

486(Part) Govt.Poramboke Land

Govt.Poramboke Land

Private Farm House

Tiled House

Nagalingeswara Temple

Water Tank

Temple

Karudakkambam 910.4556

Private Colour Granite Quarry

Vill. No.66 PACHAPANATTI

First Aid Station

Mines Office

Rest Shed

Rest Shed

Asbestos House

Well

Over head Water Tank

House

Water Tank

House

Patta Land

Tiled House

Panjhayat Motor Room

Tiled House

Shed

Tiled House

Tiled House

ERI

Refilled Area

BP1 BP2 BP3 BP4 BP5 BP6 BP7 BP8 BP9 BP10 BP11 BP12 BP13 BP14 BP15 BP16 BP17 BP18 BP19 BP20 BP21 BP22 BP23 BP24 BP25

LEGEND

Sl.No.	DESCRIPTION	SYMBOL
1.	LEASE APPLIED BOUNDARY	
2.	NATIONAL GRID WITH VALUES	
3.	VILLAGE ROAD	
4.	MINES APPROACH ROAD	
5.	TEMPORARY SHED	
6.	BENCH MARK	B.M.776.669
7.	CONTOUR AT 10M INTERVAL	830 / 840
8.	OPENCAST OLD WORKING PIT	
9.	OLD WASTE DUMP	
10.	PINK MIGMATITE PARADISO DEPOSIT	
11.	SAFETY DISTANCE 7.5M FROM PATTA LAND ON NORTH OF S.F.No.736/4. 10.0 M FROM PROMPOKE LAND 50.0M FROM KARUDAKKAMBAM, IN S.F.No.486(P) 50.0M FROM NAGALINGESWARA TEMPLE AND HOUSES IN EASTERN BOUNDARY OF S.F.No.486(P) 50.0M FROM E.B LINE AND HOUSES EAST OF S.F.No.736/4.	
12.	OLD STOCK YARD	
13.	ELECTRIC POWER LINE	
14.	BOUNDARY CORNER PILLAR	BP1-25
15.	WASTE DUMP (FOR MINING PLAN PERIOD)	
16.	PIT AT END OF MINING PLAN PERIOD	
17.	EXISTING AFFORESTATION	
18.	AFFORESTATION (FOR MINING PLAN PERIOD)	

LANDUSE PATERN

SL.No.	DESCRIPTION	PRESENT AREA (In Ha.)	AREA TO BE REQUIRED MINING PLAN PERIOD (In Ha.)
1.	MINING	2.77.0	0.80.0
2.	APPROACH ROAD	0.40.0	--
3.	WASTE DUMP	1.99.0	2.36.0
4.	OFFICE INFRASTRUCTURE	0.01.5	--
5.	AFFORESTATION	0.12.0	0.06.5
6.	UNUTILIZED AREA	21.75.0	18.52.5
	TOTAL	27.04.5	21.75.0

DISTRICT : KRISHNAGIRI

TALUK : DENKANIKOTTAI

VILLAGE NAME : JAKKERY

VILLAGE NO. : 65

FIELD NOs. : 486/Part & 736/4

LEASE HOLD AREA : 22.40.0Ha.(486/Part)
4.64.5Ha.(736/4)

TOTAL : 27.04.5Ha.

PLATE No. 8

JAKKERY COLOUR GRANITE QUARRY
PROGRESSIVE MINE CLOSURE PLAN
MINING PLAN

20 0 100 200

SCALE= 1:2,000(1CM = 20 M)

ALL DIMENSIONS ARE IN METRES

APPLICANT : ---

M/S.TAMILNADU MINERALS LIMITED
No.31, KAMARAJAR SALAI,
CHEPAUK, CHENNAI - 600 005.

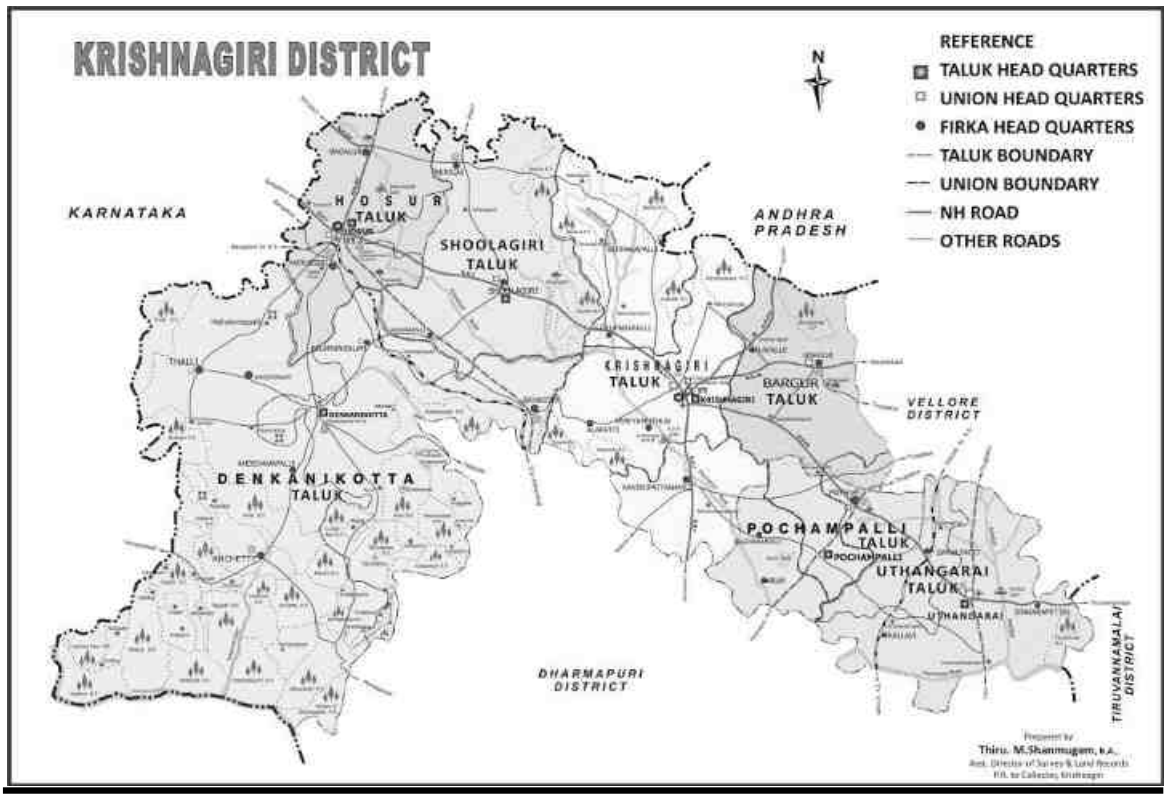
Certified that the PLAN is Correct.

M. RAM SANKAR
Mines Surveyor
Certificate No: SVR/789.
Tamil Nadu Minerals Limited.

Dr. E.GANESAN, Ph.D., PGDELP
Qualified Person,
Tamil Nadu Minerals Limited
Chennai - 600 005.

DISTRICT SURVEY REPORT
FOR MINOR MINERALS
(GRANITE)

(Prepared as per Gazette Notification S.O.3611 (E) Dt: 25.07.2018 of Ministry Environment, Forest.)



DEPARTMENT OF GEOLOGY AND MINING
KRISHNAGIRI DISTRICT

2018-2019

CONTENTS

DISTRICT SURVEY REPORT FOR MINOR MINERALS (GRANITE)

DISTRICT: KRISHNAGIRI

1. INTRODUCTION :

In pursuance to the Gazette Notification, Ministry of Environment, Forest and Climate Change, the **Government of India Notification No. S.O.3611 (E) dated 25.07.2018** laid procedure for preparation of District Survey Report of minor minerals other than sand mining or river bed mining. The main purpose of preparation of District Survey Report is to identify the mineral resources and developing the mining activities along with other relevant data of the District.

As per the instructions given in the Government of India Ministry of Environment, Forest and Climate Change Notification S.O.141 (E) dated 15.01.2016, The District Survey report for Krishnagiri district is prepared by DMMG, Krishnagiri, in association with Geological Survey of India, State Unit: Tamil Nadu & Puducherry, Chennai, to form the basis for application for Environmental Clearance, report preparations and appraisal of projects.

2. Over view of mining activity in Krishnagiri district.

A vast range of minerals of Economic importance are reported from the Krishnagiri District. They include Apatite, Corundum Copper, Gold, Iron Ore, Limestone, Kankar, Vermiculite and Dimensional Stones. Of them, the gold occurrence is in the Veppanapalli area. The gold mineralization in Veppanapalli area is studied in detail by the Geological Survey of India. The gold mineralization in Veppanapalli area is confined to the silicified zones showing gold values between 0.3

and2.6 g/t. For good dimensional stones, this district is unique in possessing both Multi Coloured and black granite occurrences. The Multi Coloured granite named as “Paradiso” is extensively quarried in Chendarapalli - Sulamalai-Modikuppam-Velampatti belt. The Hosur-Denkanikottai belt is endowed with Multi Coloured granite deposits. The black granite deposits of Krishnagiri, Hosur and Denkanikottai taluks contains potential deposits of black granite.

At present the following mining/quarry leases are in existence in Krishnagiri District.

Sl. No.	Name of the Mineral	Classification of Land	No.of Existing leases
1	Lime stone	Patta	02
2	Colour Granite	Patta land	119
		Patta land(Court order	04
		Government(M/s.TAMIN	08
		Government land (Rule 39 Court order)	28
3	Black granite	Patta Land	52
		Government Land(8-A)	06
		Government Land (M/S.TAMIN)	07
4	Rough Stone	Patta Land	32
		Government Land	90

The Office of the Deputy Director, Department of Geology and Mining is functioning under the control of District Collector, Krishnagiri. TheDeputy Director, Geology and Mining is assestining the District Collecotr in the mineral administration works.

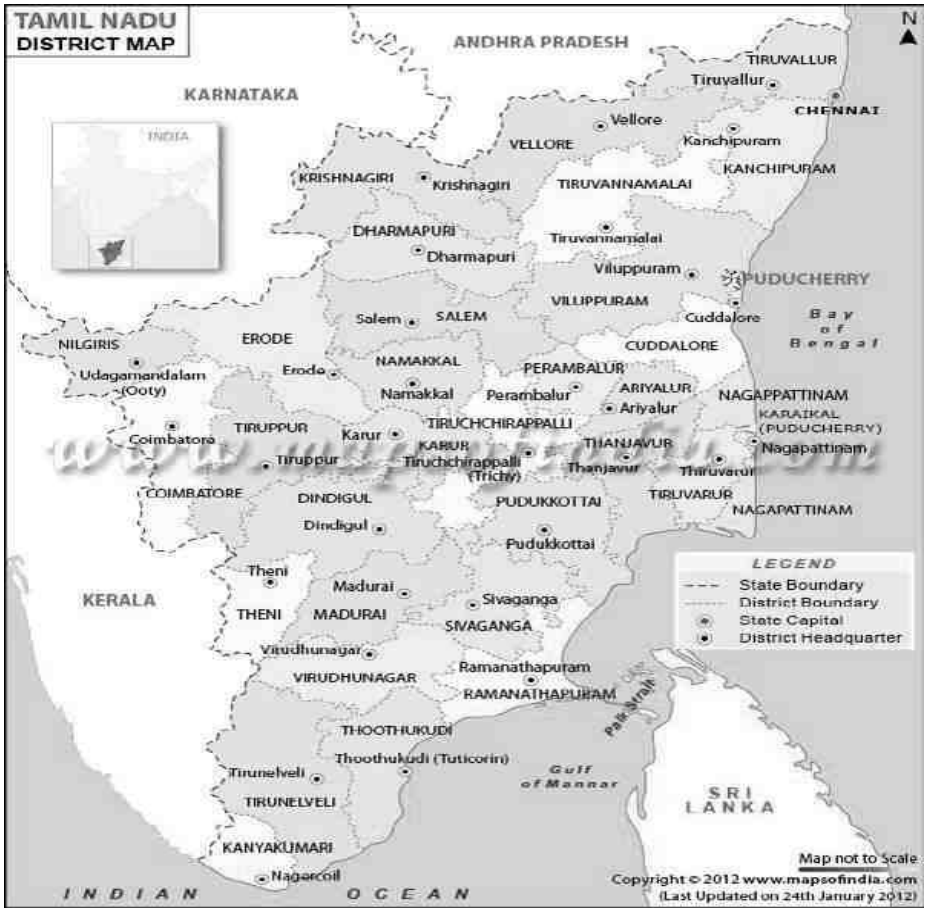
3. General profile of the district

Krishnagiri district had been formed 30th district of the Tamil Nadu by bifurcation of Dharmapuri district on 9th February 2004. It covers an area of 5143 Sq.K.M. Krishnagiri district is bounded by Vellore and Thiruvannamalai districts to the east, state of Karnataka

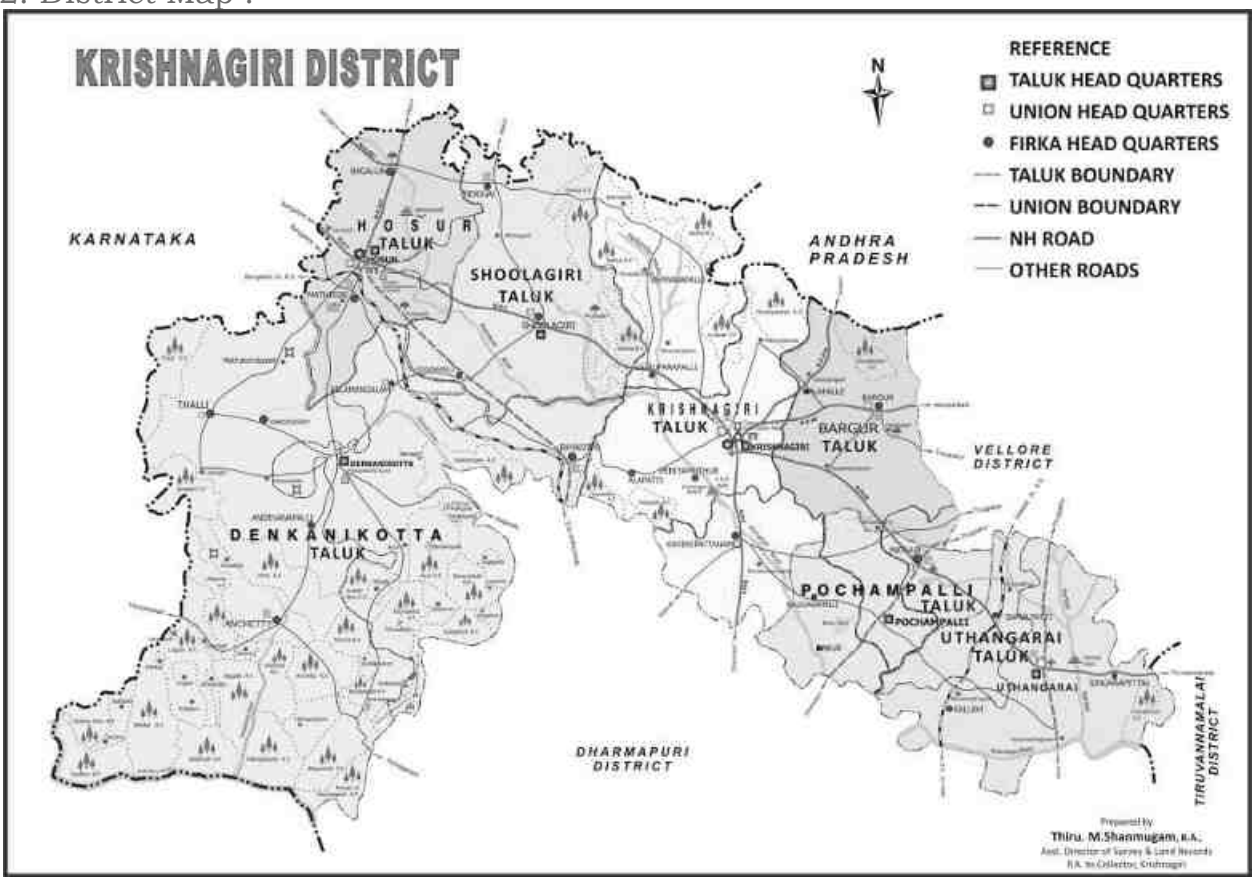
to the west, the state of Andhra Pradesh to the north and Dharmapuri district to the south. This district is elevated from 300m to 1400m above the mean sea level. It is located between 11˚12' N and 12˚49' N latitude, 77˚27'E to 78˚38'E longitude. The study area (Krishnagiri) is bordered by Andhra Pradesh on the north, Karnataka on the west and Vellore district on the eastern side **(Fig.1).** It is well connected by NH-7 (Kanyakumari-Kashmir), NH-46 (Chennai- Bengaluru), NH-66 (Puducherry-Bengaluru) and NH-219 (Krishnagiri- Kuppam). Apart from this, State Highways and District Highways are linking almost all the towns and villages of the study area. Four National highways are meeting at the Krishnagiri is a unique feature in the study area. The interior villages are well connected from Krishnagiri by fair weathered roads rendering excellent transportation network. The nearest Railway station is Jolarpettai, which located 46 km east of Krishnagiri and accessed through Chennai-Bengaluru broad gauge line. Study area is connected to Air from Bengaluru Airport, which is about 87 km from Krishnagiri. The Syed Pasha Tomb is the major landmark for Krishnagiri town. The Rayakottai Fort a declared National Monument by Archaeological Survey of India, which lies 30kms away from Krishnagiri.

It is basically has a mountainous terrain. The flatlands are irrigated by the South Pennar River. The eastern part of the district experiences a hot climate and the western part contrastingly has a pleasant climate. The average rainfall is 830mm per year. March-June is the summer season. July-November is the rainy season and during December-February winter prevails.

1. state map



2. District Map :



Field image :

1. **VEERAMALAI GREY GRANITE QUARRY**

3.1 . Location:-

Krishnagiri District is located in the North western part of Tamil Nadu and is 257.8 kms from the state capital Chennai via NH48. The district is bounded by Vellore and Thiruvannamalai districts in the East,

Karnataka state in the west, State of Andhra Pradesh in the North, Dharmapuri District in the south. Its area is 5143 Sq. Kms. This district is elevated from 300m to 1400m above the mean sea level. It is located between 11º 12'N to 12º 49'N Latitude,77º 27'E to 78º 38'E Longitude. Krishnagiri is also well connected by road ways, also an important junction on the Bangalore-Chennai (NH-48), salem - Bangalore (NH-44), Thiruvannmalai - Bangalore(NH-77 & NH-48), and Thirupathy to Krishnagiri ((NH-716, NH-69 & NH-48) are the major roads via Krishnagiri.

3.2 Area and Population :-

An official Census 2011 detail of Krishnagiri, a district of Tamil Nadu has been released by Directorate of Census Operations in Tamil Nadu. Enumeration of key persons was also done by census officials in Krishnagiri District of Tamil Nadu.

According to the 2011 census, *Krishnagiri district* had a population of 18,79,809 with a sex-ratio of 963 females for every 1,000 males, much above the national average of 929. A total of 217,323 were under the age of six, constituting 112,832 males and 104,491 females. Scheduled Castes and Scheduled Tribes accounted for 14.22% and 1.19% of the population respectively. The average literacy of the district was 63.2%, compared to the national average of 72.99%. The district had a total of 448,053 households. There were a total of 877,779 workers, comprising 218,600 cultivators, 197,369 main agricultural labourers, 15,237 in house hold industries, 310,795 other workers, 135,778 marginal workers, 17,438 marginal cultivators, 65,959 marginal agricultural labourers, 6,681 marginal workers in household industries and 45,700 other marginal workers. **Tamil** is the official and majorly spoken language while *Telugu* and *Kannada*. *Urdu* is also spoken in parts of the district. Hinduism *is the major religion, followed by* Islam *and* Christian *minorities*. There was change of 20.41 percent in the population compared to population as per 2001. In the previous census of India 2001, Krishnagiri District recorded increase of 19.62 percent to its population compared to 1991.

3.3 Administrative setup

Krishnagiri District is divided into 2 revenue divisions for administrative convenience. The Revenue division is headed by Revenue Divisional Officer in the rank of Sub – Collector in Cadre of I.A.S or a Deputy Collector. He/she is the Sub Divisional Magistrate having jurisdiction over his division. The Revenue divisional Offices are a replica of Collectorate in the matter of number of sections and they act as intermediary in the administrative setup. Each division consists of a few Taluks whose performance is constantly monitored by the concerned Divisional Office.

Revenue Administration :

Name	Total
Revenue Divisions	2
Revenue Taluks	7
Revenue Firkhas	29
Revenue Villages	661
Muncipalities	02
Blocks	10
Town Panchyat	06
Village Panchayats	333

3.4 : Agricultrural Resources and Irrigation :

Krishnagiri district is one of the potential districts for cultivation of agricultural and horticultural crops. Total cultivated area of 224767 Hectares, out of which 180902 Ha Net cultivated area against the 5,14,325 Ha. of total geographical area. The total normal area cultivated under all crops is 224767 Hectares out of which 73046 Ha is under irrigated and 151720 ha area under rainfed crops. The major agricultural crops in the

district are grown Paddy, Ragi, Redgram, Cowpea, Maize, Cumbu, Groundnut, Horsegram and minor millets. The major cultivated area of agricultural crops occupied by rainfed agriculture. The total number of 2,81,733 famers engaged in agriculture out of which 213023 are Marginal farmers (76%), 45970 are Small farmers (16%), remaining 4615 farmers (8%) are medium and large farmers.

The important crops of **Krishnagiri District** are *paddy, maize, ragi, banana, sugarcane, cotton, tamarind, coconut, mango, groundnut, vegetables and flowers*. The district has an excellent scope for agri-business.

The Regional Agricultural Research Center of Tamil Nadu Agricultural University has been functioning efficiently at **Paiyur** in **Kaveripattinam union** since 1973. This center functions in 18.5 hec. of land. It helps the peasants to develop and adopt the modern technique of cultivation. It has developed hybrid seeds by research which yields more tonnage and good quality.

HORTICULTURE

Krishnagiri District is more suitable for cultivation of Horticulture crops. Other Plantation crops, medicinal plants, Fruits, Vegetables, Spices, and flowers are grown well by way of its moderate climate, high altitude and fertility of the soil.

SERICULTURE

5069 acres of land is under mulberry cultivation in Krishnagiri District. This has the employment opportunity for about 24,345 persons at the rate of 5 per acre. Training in Mulberry farming, Rearing Silk Worms is done through a large network of Govt. Departmental Institutions of Sericulture such as Silk quality development farms 75, Govt. Sericulture training center 1, Govt. Sericulture Farm 1 Base seedlings (grain age) development farms 9, Govt. Bi-voltine grain age centers 5, Govt. Cocoon markets 5, Silk Reeling Unit 1, Silk Twisting unit 1, Technical support and

service center for rearing silk worm 17, with the above maintained facilities sericulture industry has good scope in this district.

NATURAL RESOURCES

Krishnagiri is one among the districts of Tamil Nadu, which with natural resources having 2,024 Sq. Kms of forest cover is its unique feature. The hill ranges of this district are called by the name 'Melagiri'. The major type of forest seen here are Tropical, Deciduous forests, thorny shrubs and bamboo forest. Dense forest cover Denkanikottai region. The other region contains shrubs, hills and hillocks with bushes.

FLORA AND FAUNA

The major wild animals include Elephants, Sambar, Spotted Deer, Gaur, Wild boar, Panther etc. The forest area of Denkanikottai Taluk forms the prime elephant habitat with lot of bamboos and this area constitutes the Cauvery elephant reserve, which is constituted over and area of about 450 Sq. Kms. The bird population is also attractive with beautiful bird like Paradise flycatcher. Big lakes in Anchetti and Hosur areas also attract large number of migratory birds like Painted storks, Teals etc. Apart from these birds and mammals, there are variety of butterflies, giant spiders etc. that are coming under endangered list. Kodakkarai shoal forest in Denkanikottai Taluk is known for large scale migratory butterflies during a particular season then one can observe thousands of migratory butterflies passing through this forest like a passing cloud.

The district is a paradise for natural lovers. The flora include variety of timber trees like Rose wood, Teak, Sandal etc. Hundereds of medicinal herbs, minor forest plants like nelli, kadukkai, cheekai, pungam etc. The following trees like 'Charakkonnai' ('Cassia histula'). Since pungam trees are found in abundance in this forest pungam oil is extracted from this seeds of this tress which is a non pollutant Bio-fuel.

RAINFALL

The total rainfall received during 2017 is 1130mm against the Normal rainfall of 842mm with average of 59 rainy days.

3.5 TRADE AND COMMERCE :

Internal trade of the district is developing on a large scale. The Mangoes, Rose and Mulberry are the major crops in the District. These products enter into the market in different parts of the country and also exported to many countries. Market Committees are functioning in the district for the purchase and sale of Mangoes, Rose and Mulberry, groundnut, ragi, paddy and vegetables and other edible oil products. The co-operative societies for milk are functioning at all parts of the district. At Hosur, Agricultural primary complex functioning with all facilities to assist the farmers for marketing their agricultural products.

4. GEOLOGY OF THE DISTRICT:

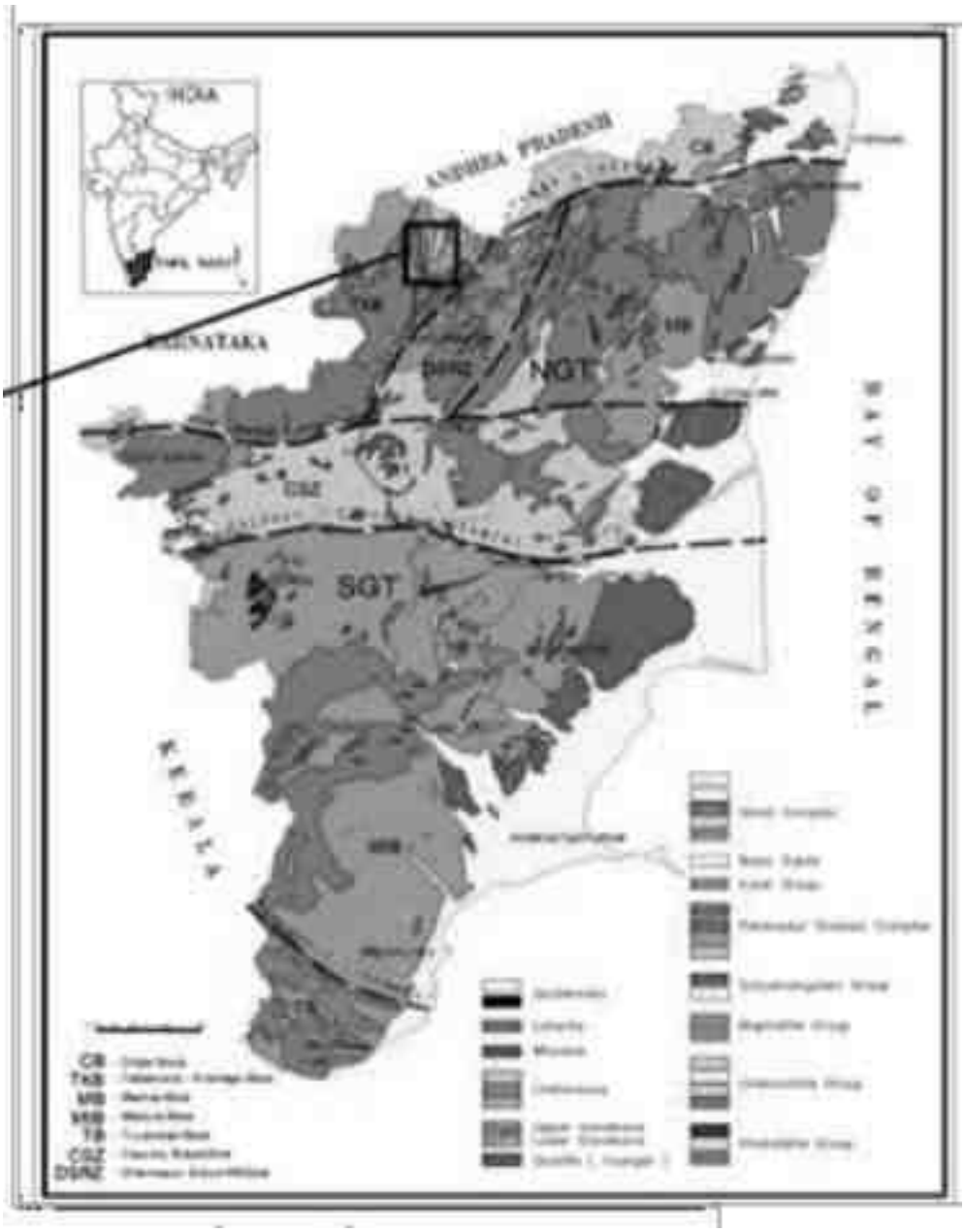
The geological formations of the district belong mainly to Archaean age along with rock of Proterozoic age. The former is rerpresented by Khondalite Group of rocks, Charnockite Group of rocks, Migmatites Complex, Sathyamangalam Group of rocks, while the latter is represented by Alkaline rocks. The Khondalite Group includes garnet sillimanite gneiss and quartzite which occur as small patches. The migmatite complex includes garnetiferous quartzofeldspathic gneiss and hornblends biotite gneiss, the former exposed on the western part of the district. The Sathyamangalam Group includes fuchsite quartzite, sillimanite mica schist and amphibolites. The Bhavani Group in this area includes fissile hornblende-biotite gneiss, granitoid gneiss and pink migmatite. Amphibolites with barbed ferruginous quartzite and associated quartzo-feldspathic rocks (Champion Gneiss) represent the Kolar group and are found west and southwest of Veppanapalli. Following this there are basic intrusions occurring as dykes.

The Charnockite Group occupies a major part of the south-west portion of this district with small bands of Garnetiferous quartzo-feldspathic gneiss, Granite gneiss and dolerite dykes. The North-East and Northern part of the District mainly consist of granite gneiss with small patches of

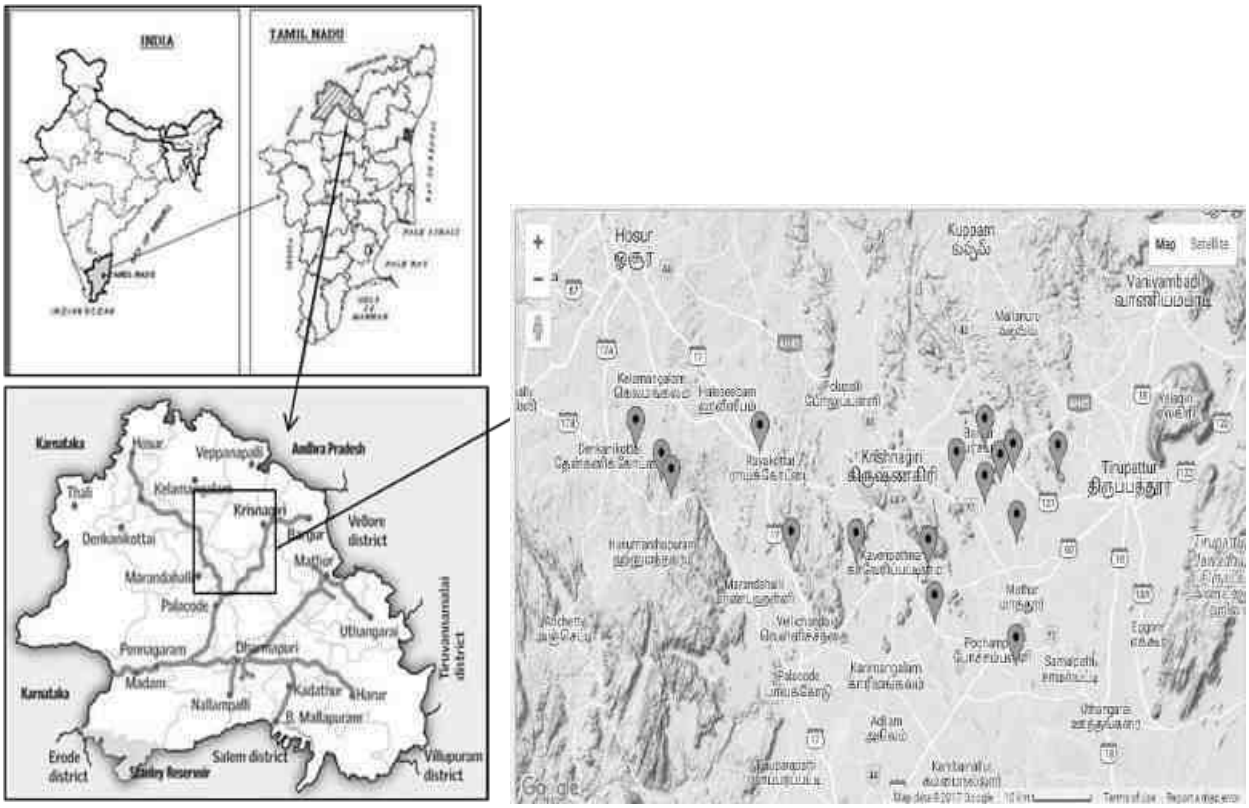
Pink Migmatite, hornblende-biotite gneiss and dolerite dykes. The Eastern part of the district consists of Epidote-Hornblende Gneiss, Ultra Mafics, Syenite and Carbonatite.

The Alkaline Complex is represented by epidote-hornblende gneiss, ultramafics, syenite and carbonatite and these are distributed in the eastern part of the district. Innumerable basic dykes and felsites, quartz, barites and pegmatite veins form part of the Alkali Complex.

Geological Map of Tamil nadu



Krishnagiri District Map :



5. Drainage of Irrigation pattern

Krishnagiri district basically has a mountainous terrain. The General regional slop is towards east. The various land forms occurring in the districts such as structural hills, erosional plains residual hills, rolling uplands of different facies belonging to the denudational and structural land forms. Cauvery River forms the southwestern boundary of the district. Pennaiyar is the major river draining the district and is ephemeral in nature. The major reservoirs are KRP dam, Kelavarapalli Dam and Barur Lake. The prominent dams in the district namely KRP dam has a present water level at 39.05ft as against the full capacity of 52ft with command area of 9012 acre, Kelavarapalli dam water level 41.50ft against the full capacity of 44.28 feet with command area of 9083 acre and Barur Lake 12.900 feet with command area 2400 acre. The other major reservoirs are Pambar and Shoolagiri Chinnar with storage 280 Million Cubic feet and 112 Million cubic feet. It originates from Nandhi hills in Karnataka, enters Tamil Nadu west of Bagalur and flows almost in a southeasterly direction till it reaches Manjamedu from where

it flows along the district boundary before entering the district, again near Hanuman Tirtham. After flowing for a short distance in an easterly direction, it again follows the district boundary before entering the neighboring Dharmapuri district. Pambar and Burgur Ar., are among the important tributaries of Pennaiyar draining part of the district.

6. Land utilization pattern in the districts.

Krishnagiri district is one of the potential districts for cultivation of agricultural and horticultural crops. Total cultivated area of 224767 Hectares, out of which 172884 Ha Net cultivated area against the 5,14,325 Ha. of total geographical area. The total normal area cultivated under all crops is 224767 Hectares out of which 73046 Ha is under irrigated and 151720 ha area under rainfed crops. The major cultivated area of agricultural crops occupied by rainfed agriculture.

Total Geographical area 5,14,326 Hects.	
a) Forest --	**2,03,964**
b) Net Cultivated Area --	1,72,884
c) Land under Non-Agriculture use -	41,986
d) Permanent pastures and Grass Land-	7,855
e) Cultivable waste land -	4,352
f) Land under miscellaneous tree crops and grows	8,344
g) Barren and uncultivable land -	23,937
h) Current follows --	34,063
i)Other follows -	16,941

7. Surface water and Ground Water Scenario of the District:

7.1 Hydro Geology :

Krishnagiri district is underlained by Archaean crystalline formations with Recent alluvial deposits of limited areal extent and thickness along the courses of major rivers. The occurrence and movement of ground water are controlled by various factors such as physiography, climate, geology and structural features. Weathered, and

fractured crystalline rocks constitute the important aquifer systems in the district. Ground water generally occurs under phreatic conditions in the weathered mantle and under semi-confined conditions in the fractured zones at deeper levels. The thickness of weathered zones in the district ranges from less than a meter to more than 15m. The yield of large diameter dug wells in the district, tapping the weathered mantle of crystalline rocks ranges from 100 to 500 lpm. These wells normally sustain pumping for 2 to 6 hours per day, depending upon the local topography and characteristics of the weathered mantle. The depth to water level (DTW) during pre monsoon (May 2006) ranged between 0.5 and 9.9 m bgl in the district. In major part of the district the DTW is more than 5 5 mbgl. Whereas it ranged between 2 and 9.9 m bgl during post monsoon, in the district and the DTW is in the range of 5 – 10 m bgl in the entire district except a few isolated pockets. The yield of successful exploratory wells drilled in the district ranged from 0.78 lps to 26 lps. As per the studies the wells drilled in granitic gneiss have higher yields than the wells drilled in charnockites. The specific capacity of the wells ranged from 1.2 to 118.0 lpm/m/dd. The piezometric head of fracture zones varied between 0.50 and 18.45 m bgl.

Long Term fluctuation (1998-2007) :

The long-term water level fluctuation for the period of 1998-2007 indicates a rise in water level in the range of 0.098-0.414 m/year whereas the fall in water level ranges between 0.0666 and 1.618 m/year.

Aquifer Parameters:

The transmissivity values of fracture zones ranged from 1 to 188 m2 /day with low to very low permeability values.

Type of aquifer	Discontinous unconfined to semi confined aquifers in fissured formations.
Aquifer parameters	--
Well yield lpm:	36 – 1125
Transmissivity (T)(m2/day)	8 – 73
Transmissivity (T)m 2/day	8 – 73
Permeability (K)m/day:	0.78 - 23
Depth of Water level	8m to 25m

GROUND WATER QUALITY :-

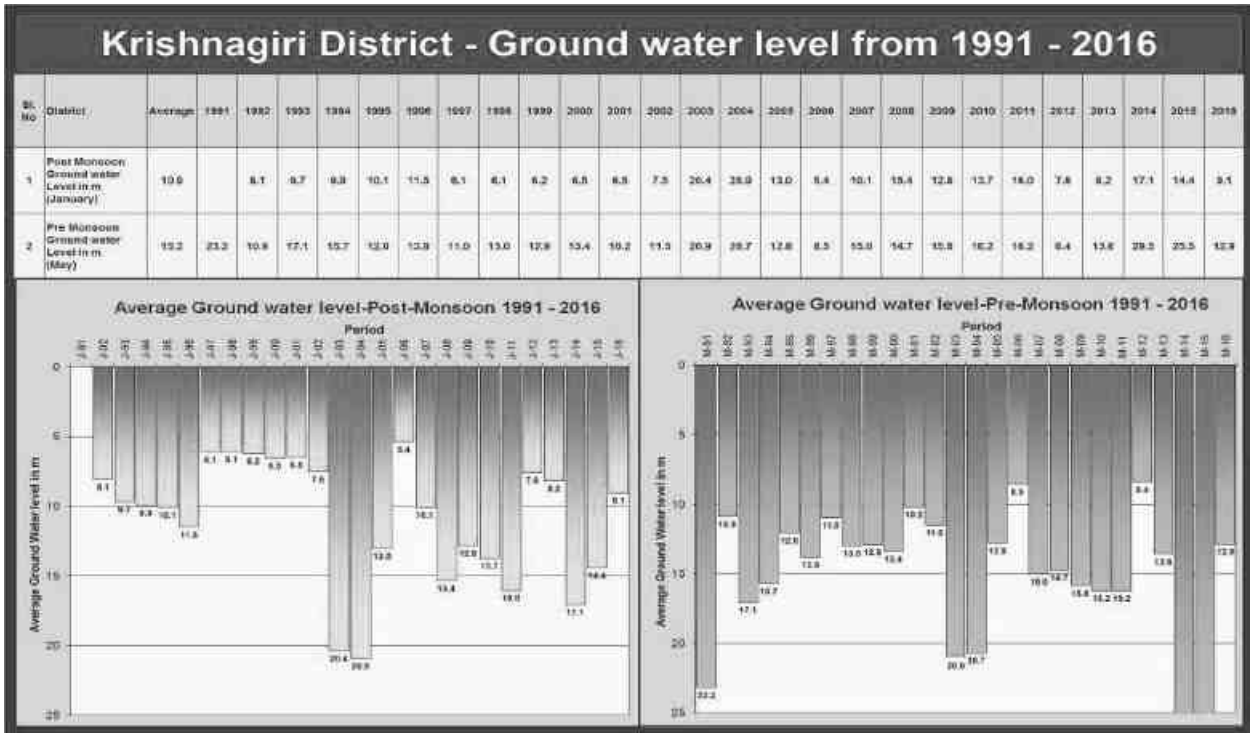
Ground water in phreatic aquifers in Krishnagiri district, in general, is colorless, odorless and predominantly alkaline in nature. The specific electrical conductance (EC) of groundwater in the phreatic zone (Micro Siemens at 25°C) during May 2006 was in the range of 830 to 3030 in the district. In about 67% of the samples analyzed the ground water is of average quality with EC less than 2250. It is observed that the ground water is suitable for drinking and domestic uses in respect of all the constituents except total hardness, fluoride and nitrate in about 67.85 and 50% of the samples. Total hardness as CaCO3 is observed to be in excess of permissible limits in 33% of the samples analyzed, whereas nitrate is found in excess of 45 mg/l in about 50% of samples. Excess fluoride more than the permissible limit of 1.5 mg/l is observed 8 at K.Vetrapatti and Karukanchavadi areas. The incidence of high total hardness is attributed to the composition of litho-units constituting the aquifers in the district, whereas nitrate pollution is most likely due to the use of fertilizers and other improper waste disposal.

Ground Water Level::

The Ground Water levels from the 44 number of observation wells of TWAD have been analysed for Post-Monsoon and Pre-Monsoon. Since 1991,average Ground water level in m Below Ground Level for pre and post

monsoon is as follows:

Jan 2012	May 2012	Jan 2013	May 2013	Jan 2014	May 2014	Jan 2015	May 2015	Jan 2016	May 2016	5 Years Pre Monsoon Average	5Years Post Monsoon Average
7.60	8.43	8.20	3.58	7.10	1.27	4.43	8.50	9.05	2.85	6.92	1.28



Ground Water Development:

The development of ground water for irrigation is mainly through dug wells tapping weathered residuum. However, in view of the comparatively high level of ground water development in 4 blocks of the district and the quality problems due to lithogenic and anthropogenic factors, it is necessary to exercise caution while planning further development of available ground water resources in the district. Dug wells tapping the weathered mantle with horizontal bores wherever feasible are ideally suited for the terrain. The narrow linear valley fill deposits are also suited for development through shallow tube wells drilled

down to 30 m bgl. However the actual number of wells will depend on several factors such as availability of land for construction, nature of weathered formation, their water bearing characteristics, etc.

Status of ground water Developmen:

The stage of ground water development ranges from 34 to 159%. The minimum is in Thali block and the maximum is in Mattur block. The ground water development is more than 100% in 4 blocks viz., Burgur, Mathur, Uthangarai and Veppanapalli. The estimation of ground water resources for the district has shown that four blocks are over exploited and one block is semi-critical

Block	Net Ground water availability (M.Cu.m)	Existing Gross Draft for irrigation (M.Cu.m)	Existing Gross Draft for Domestic and Industrial Water supply (M.Cu.m)	Existing gross draft for all uses (M.Cu.m)	Allocation for Domestic and Industrial Requirement supply up to next 25 years (2029) (M.Cu.m)	Net ground water availability for future irrigation development (M.Cu.m)	Stage of Ground Water developmen t (%)	Category of Block
Burgur	45.75	65.71	2.65	68.37	2.78	-22.75	149	Over exploited
Hosur	37.48	25.93	3.84	29.77	4.03	7.51	79	Semi-critical
Kaveripattanam	28.25	21.57	3.22	24.79	3.38	3.29	88	Critical
Kelamangalam	35.24	14.06	1.73	15.80	1.82	19.35	45	Safe
Krishnagiri	43.54	21.70	2.0	23.71	2.10	19.72	54	Safe
Mathur	29.91	45.73	1.72	47.45	1.81	-17.63	159	Over exploited
Shoolagiri	40.92	28.39	2.74	31.14	2.88	9.64	76	Semi-critical
Thali	50.78	15.67	1.56	17.24	1.64	33.46	34	Safe
Uthangarai	45.29	65.60	2.48	68.09	2.61	-22.92	150	Over exploited
Veppanapalli	27.19	31.46	1.10	32.57	1.15	-5.42	120	Over exploited
Total	**384.38**	**335.89**	**23.09**	**358.98**	**24.24**	**24.25**	**95.4**	

Water Conservation and Artificial Recharge :

CGWB had prepared a master plan to augment groundwater potential by saturating the shallow aquifer taking into consideration the available unsaturated space during post monsoon and available uncommitted surplus run off. Subsequently, computations have been made for Drought Prone Area Program (DPAP) for over exploited and critical blocks in the districts warranting immediate attention. Institute of Remote Sensing, Anna University had prepared block wise maps demarcating potential zones for artificial recharge for the State of Tamil Nadu. Subsequently, State

Government agencies have constructed artificial recharge structures with their own fund or with fund from Central Government, dovetailing various government programs. Ministry of Water Resources, Government of India has initiated Dug Well Recharge Scheme in the State. The scheme is being implemented by the Nodal Department (SG&SWRDC, PWD, WRO, Government of Tamil Nadu) with the technical guidance of CGWB. The subsidy of Rs. 4000/- for small and marginal farmers and Rs. 2000/- for the other farmers is credited to the beneficiaries' bank account through NABARD. The scheme after implementation will prove to be beneficial to the irrigation sector. The available uncommitted surplus run off has to be recomputed, taking into consideration the quantum of recharge effected through existing irrigation dug wells also. The existing structures and uncommitted surplus flow should be considered for further planning of artificial recharge program. 9, On the basis of experimental studies, it has been found that de-silting of existing tanks followed by percolation pond with recharge wells, recharge shafts are economical. There is considerable scope for implementation of roof – top rainwater harvesting in the district. Recharge pits / Shafts / trenches of suitable design are ideal structures for rainwater harvesting in such areas. Central Ground Water Board is also providing free technical guidance for implementation of rooftop rainwater harvesting schemes

8. Climate and Rain fall of the District

8.1 Climate :

Eastern part of the district experiences hot climate and Western part has a contrasting cold climate. the average normal rainfall is 850.88 mm per annum. March - June is summer season. July - November is Rainy Season and between December - February winter prevails.

8.2 Rain fall :

The total rainfall received during 2017 is 1130mm against the Normal rainfall of 830mm with average of 59 rainy days.

Rain fall details month wise:

Sl. No.	Name of the month	Normal Rain fall (in mm)
1	April	32.9
2	May	83.0
3	June	50.7
4	July	70.3
5	August	124.5
6	September	41.6
7	October	202.2
8	November	58.6
9	December	23.6
10	January	--
11	February	10.4
12	March	--

9. Details of Granite Quarry leases in Krishnagiri District:

9.1 - Details of various Granite formations / Deposits in the District

Krishnagiri District is comprised of Archaean peninsular gneisses such as Charnockites, Hornblende gneisses, Biotite gneisses and migmatites, dolerites and are intruded by younger formations like pegmatite and quartz veins. The peninsular gneisses/ migmatite consists of biotite mica, plagioclase and orthoclase feldspar and quartz etc. The granite occurs as sheet rocks running to several kms from NNE-SSW as a massive rock formations with almost vertical dip.

The order of super position of geological sequence are given as follows.

Sl. No	Rock Formations	chronology
1.	Top Soil Morum (3m Thick)	Recent Age
2.	Pegmatite and Quartz / veins	Archaean Age
3.	Dolerite Dyke	Archaean Age
4.	Peninsular Gneisses and Migmatites	Archaean Age (Kolar Group)
5.	Biotite Gneisses	Archaean Complex

The Krishnagiri district is enriched with the following type of granites, which are most popularly and commercially known as in the

granite industries are the **PARADISO, BASH PARADISO, RED MULTI, DACOTA AND THE BLACK GRANITE**. The Geological rock formations occurs almost all along the District with a general strike direction of NNE-SSW.

The areas of predominant occurrence of these granite rock types in Krishnagiri district are as follows.

1. Grey Granite: (The Paradiso)

Taluk	**Villages**
Krishnagiri	Mothinayankanpatti
	Modikuppam
	Marichettihalli
	Thatrahalli
	Thatrahalli - (Colour Granite - Dacota)
Bargur	Chendrapalli
	Jagadevipalayam
	Soolamalai / sulamalai
	Kondappanayanapalli
	Ikondhamkothapalli
	Puligunda
	Achamangalam
	Pasinayanapalli
Uthangarai	Veppalampatti
	Kunnathur
Pochampalli	Veeramalai
	Nagampatti
	Sivampatti
	Battrahalli
	Nagojanahalli
	Alerahalli
	Kadapasandampatti
	Mahadevagollahalli
	Sonarahalli
	Vilangamudi
	Kendikampatti
	Sellaguttapatti
	Baleguli
Denkanikottai	Thimjepalli

2. Colour Granite: (Bash Paradiso)

Taluk	Villages
Denkanikottai	Thavarakarai
	Nagamangalam
	Palayamkottai
	Thiyanadurgam
	Nellumaruagraharam
	Nallur
	Pachappanatti
	Thimjepalli

3. Colour Granite: (Red Multi)

Taluk	Villages
Denkanikottai	Jawalagiri
	Irudhukottai
	Sandhanapalli
	Thimjepalli
	Palayamkottai
	Agalakottai
	Madakkal
	Karandapalli
	Jakkeri
	Nellumaragraharam
	Pachappanatti
	Bodichipalli
Hosur	Ullati

4. Black Granite: (Dolerites)

Taluk	**Villages**
Krishanagiri	Varatanapalli
	Ragimanapalli
	Agaram
	Marachandram
	Kathiripalli
	Sokkadi
	Naduvanapalli
	Agasipalli
Bargur	Puligunda
	Guttur
Denkanikottai	Karandapalli
	Kodiyalam
	odiyandahalli
	Sandanapalli
	Kalugondapalli
	Agalakottai
	Ulimaranapalli

	Palayamkottai
	Mallikarjunadurgam
	Irudhukottai
	Kuppati
	Thogaraiagraharam
	Kakkadasam
	Hanumanthapuram
	Devaganapalli
	Anniyalam
	Jakkeri
Hosur	Ullati
	Immidinayakanapalli
	Sembarasanapalli
	Addakuruki
Uthangarai	Kunnathur

9-2. List of Granite quarries in Krishnagiri District.

a) Minor Mineral : Colour Granite:

Sl. No.	Name and address of the lessee	Village and taluk	SF No (s).	Extent (in Hects.)	Name of Mineral	G.O No. and Date	Lease Period	Co-ordinates	
								Latitude	Longitude
1	Thiru K.Arjunan, No. 100, Kaveripattinam, Krishnagiri.	Veeramalai, Pochampalli Tk	286/4	0.52.0	Colour Granite	G.O 3D 37 Ind.Dept Dt 3.10.2002	18.11.2002 to 17.11.2022	12°21'30"N	78°20'30"E
2	Tvl. BannariAmman Sugars Ltd, 252 Mettupalayam Road, Coimbature.	Chendarapalli Krishnagiri Taluk	356/1A1 356/1A2 356/1B2 356/3A1 356/3A2 357/1A1 357/4A1A 357/4A2A 357/5A	0.34.0 0.68.5 0.73.0 0.24.5 0.31.0 0.03.0 0.17.5 0.09.5 0.24.0 ------- 2.85.0	Colour Granite	G.O. (3D)36 Ind.(E2) Dept. Dt 03-10-2002	18-11-2002 to 17-11- 2022	12°27'26."N	78°17'00"E
3	Thiru.B.S.Ravi, 100E Gandhi Bazzar, B.T.M.Road, Bargur.	Chendarapalli Krishnagiri Taluk	369 /2	2.46.5	Colour Granite	G.O. (3D)35 Ind.(MMB 2) Dept. Dt 16-09-2003	10-11-2003 to 09-11- 2023	12°29'00."N	78°18'27"E
4	Thiru K.Srinivasan, 38 B,Mel street, Karimangalam, Palacode Taluk	Thatrahalli, Krishnagiri Taluk	305/1 305/2A 305/5(p) 306/1(p)	0.03.0 0.38.5 0.43.0 0.16.0 -------- 1.00.5	Colour Granite	G.O. (3D) 37 Ind.(MMB 2) Dept.Dt 17-09-03	10-11-2003 to 09-11- 2023	12°18'20"N	78°14'50"E
5	Thiru P.Jayaraj, 1/3A Kukkalpatti, Mecheri, Salem Dist.	Jagadevipalayam, Krishnagiri Taluk	57/2A 57/2B 59/1	0.20.0 0.59.5 0.26.5 ------ 1.06.0	Colour Granite	GO 3D No. 95 Ind. (MMB) Dept dt. 26.9.2005	28.11.2005 to 27.11.2025	12°29'03."N	78°18'54"E
6	Thiru K.Srinivasan,38 B,Mel street,Karimangalam,Palacode Taluk	Thatrahalli, Krishnagiri Taluk	153/1B15 4/2156/1C (p)	0.29.50. 31.00.5 5.0------- 1.15.5	Colour Granite	GO 3D No. 113 Ind. (MMB3) Dept dt. 11.11.2005	07.12.2005 to06.12.2025	12°29'03."N	78°14'35"E
7	Selvi Deborah Manickam, 6/145 Theerthagiri Nagar, Palacode 636 808 Dharmapuri District.	Thavarakarai Denkanikottai Tk	906/1 (part)	1.23.0	Colour Granite	G.O.3D No 6 Ind.(MMB 3) Dept. Dt 16-1-2006	06.3.2006 to 05.3.2026	12°29'18.43" N	77°43'59.03" E
8	Thiru K.Srinivasan, 38 B,Mel street, Karimangalam, Palacode Taluk	Thatrahalli, Krishnagiri Taluk	151/1	1.20.5	Colour Granite	GO 3D No.22 Ind. (MMB2) Dept dt. 8.2.2006	06.03.2006 to 05.03.2026	12°20'03."N	78°14'35"E

9	Thiru B.S. Ravi, S/o B.C.Subban, 100 E, Gandhi Bazzar, B.T.M. Road, Bargur, Krishnagiri Taluk.	Sulamalai Krishnagiri Taluk	339/2	1.19.0	Colour Granite	GO 3D No.30 Ind. (MMB3) Dept dt. 22.2.2006	27.03.2006 to 26.03.2026	12°29'00"N	78°18'17"E
10	Tmt. Amar Jothi, W/o C.Srinivasan, B.R.G. Madhepalli,635 104, Krishnagiri Taluk	Jagadevi palayam Krishnagiri Taluk	228/1 228/2 228/3 ------	1.01.0 0.26.5 0.03.5 ------ 1.31.0 ------	Colour Granite	GO 3D No.10 Ind. (MMB2) Dept dt. 23.1.2006	27.03.2006 to 26.03.2026	12°29'11"N	78°21'12"E
11	Tmt. M. Sowdeswari W/o Muniraj, 3/413 Hanumanthapuram, Palacode Taluk, Dharmapuri Dist.	Kondappa nayana palli Krishnagiri Taluk	133/3D2	1.41.5	Colour Granite	GO 3D No.34 Ind. (MMB3) Dept dt. 27.2.2006	27.3.2006 to 26.03.2026	12°28'50"N	78°20'10"E
12	A.Senthilkumar, S/o Arjunan, 291/3-108-A-3, M.G. Road, New Failands,Salem	Nagampatti, Pochampalli Tk	23/2	1.13.0	Colour Granite	G.O 3D No. 29 Ind.Dept Dt 22.2.2006	27.3.2006 to 26.3.2026	12°23'45"N,	78°24'15"E
13	Tmt.A. Shanthi, ABR Exports, 161/4B, Main Road, Bargur, Krishnagiri District.	Sivampatti, Pochampalli Taluk	2/1B (p) 11/1A (p) 11/1B (p)	1.36.5 0.16.0 0.14.5 -------- 1.67.0 --------	Colour Granite	G.O 3D No. 48 Ind.Dept Dt 28.2.2006	27.3.2006 to 26.3.2026	12°34'25"N	78°25'36"E
14	Tvl. Imperial Granites (Pvt) Ltd, 76, Cathedral Road, Chennai -600 086	Jawalagiri Denkanikottai Tk,	342/1 (p) 342/2 (p) 342/3(p) 342/4 342/5A(p) 345/1 345/2 345/3 349/2 Total	0.08.0 0.63.0 0.81.0 0.28.5 0.38.0 0.93.0 0.79.0 1.19.5 0.72.0 -------- 5.82.0 -------	Colour Granite	GO (3D) No. 38 Ind. (MME-II) Dept. dt. 8.3.2007	24.4.2007 to 23.4.2027	12°32'32.28" N,	77°37'33.36" E
15	Thiru B.K. Srinivasan, S/o Thiru B.C. Krishnan, No. 70/53, Karakuppam Road, Bargur -635 104. Krishnagiri Taluk & Dist.	Veppalampatti Krishnagiri Tk,	477/2A 477/2B 477/3 477/4 477/5 477/8 477/9 Total	0.03.0 0.19.5 0.06.0 0.44.5 0.05.0 0.01.5 0.77.5 -------- 1.57.0 -------	Colour Granite	GO (3D) No. 29 Ind. (MME-II) Dept. Dt .21.2.2007.	24.4.2007 to 23.4.2027	12°22'30"N,	78°20'00"E
16	Thiru M. Naveen Kumar, S/o V. Muniraj, 3/4 B, Hanuman thapuram, Palacode (tk), Dharmapuri Dist.	Thatrahalli Krishnagiri Tk,	381 (p)	1.51.5	Colour Granite	GO (3D) No. 33 Ind.(MME-II) Dept. Dt. 21.2.2007	24.4.2007 to 23.4.2027	12°19'05"N,	78°00'13"E

17	Thiru N.K. Shashidhar, No. 163/2 1st Main Road, Opp. IBP Petrol Bunk, Sehsadhri puram, Bangalore	Nagojanahalli , Pochampalli Taluk	404/1A	2.10.0	Colour Granite	GO (3D) No. 82 Ind.(MME-II) Dept. Dt. 25.10.2007	26.11.2007 to 25.11.2027	12°21'40"N,	78°18'40"E
18	Tmt. Haseen Parveen D/o Mohammed Abdul Basith, No. 14, Hayes Road, rich Mount Town, Bangalore 25	Jagadevipalayam Krishnagiri Taluk	55/2 H1, 55/2H2 54/4	0.42.0 0.44.5 0.40.5 --------- 1.27.0	Colour Granite	GO (3D) No. 80 Ind.(MME-II) Dept. Dt. 25.10.2007	03.12.2007 to 02.12.2027	12°29'11"N,	78°19'07"E
19	Mir Tahir Ali, 18/16, 3rd cross, co operative colony, Krishnagiri.	Chendarapalli Krishnagiri Taluk	380/1 (p)	2.48.0	Colour Granite	GO (3D) No. 79 Ind.(MME-II) Dept. Dt. 25.10.2007	10.12.2007 to 09.12.2027	12°30"N,	78°20'55"E
20	M.U. Munaff, 1/38-A Mosque street, Mathur, Pochampalli Taluk, Krishnagiri District.	Sivampatti, Pochampalli Taluk	1/3B (P) 2/2 4/1 5/1	0.17.5 0.20.0 0.29.5 0.33.0 -------- 1.00.0	Colour Granite	GO (3D) No. 5 Ind.(MME-II) Dept. Dt. 28.1.2008	5.3.2008 to 04.3.2028	12°24'25"N,	78°25'36"E
21	Tmt. P.Jayamma, W/o B.Mani, No. 32 A cross Near ITI Layout Kathriguppe Main Road, Bangalore 560 085	Nagampatti, Pochampalli Tk	128/1A 129/2A 25/1B	0.75.5 0.31.0 1.13.5 ------ 2.20.0	Colour Granite	GO (3D) No. 1 Ind.(MME-II) Dept. Dt. 23.1.2008	18.3.2008 to 17.3.2028	12°23'45"N,	78°24'15"E
22	Tmt. P.Jayamma, W/o B.Mani, No. 32 A cross Near ITI Layout Kathriguppe Main Road, Bangalore 560 085	Sivampatti, Pochampalli Tk	202/2 202/3 202/4 202/5 202-7A2(p) 202/7B 202/7C1 202/10A2 202/10B1 202/11A2 202/11B2 203/1C (p) 203/1E	0.01.5 0.02.5 0.01.5 0.12.0 0.07.0 0.15.5 0.10.0 0.16.5 0.09.5 0.06.5 0.06.0 0.22.5 0.07.5 -------- 1.18.5	Colour Granite	GO (3D) No. 2 Ind.(MME-II) Dept. Dt. 24.1.2008	18.3.2008 to 17.3.2028	12°24'35"N,	78°25'50"E
23	Thiru C.Rajendran S/o Chinnappa naidu, Chendarapalli Village, Anchoor Post.	Soolamalai Krishnagiri Taluk	248/3A1B (p) 248/3B1 (p)	2.00.0 0.10.5 -------- 2.10.5	Colour Granite	GO (3D) No. 13 Ind.(MME-II) Dept. Dt. 10.3.2008	15.4.2008 to 14.4.2028	12°31'56"N,	78°19'52"E

24	M/S. Aryan Stones (p) Ltd, No. 12, Road 3, Jigini Industrial Area, Anekal Taluk, Bangalore District.	Irdukottai Denkanikottai Taluk	1161/8 1167/6	1.40.0	Colour Granite	GO (3D) No. 34 Ind.(MME-2) Dept. Dt. 9.6.2008	30.7.2008 to 29.7.2028	12°25'48.10" N,	77°50'26.47" E
25	M/S. Aryan Stones (p) Ltd, No. 12, Road 3, Jigini Industrial Area, Anekal Taluk, Bangalore District	Irdukottai Denkanikottai Taluk	1158/3 1158/6	1.40.0	Colour Granite	GO (3D) No. 35 Ind.(MME-2) Dept. Dt. 9.6.2008	30.7.2008 to 29.7.2028	12°25'46.11" N	77°50'25.83" E
26	Tvl. S.M.Exports, Sole Prop. Of K. Madhaiyan, No. 2 A2 III cross, Gopalakrishna colony, Krishnagiri	Kondappanay ana palli Krishnagiri Taluk	133/1, 133/5 (p)	0.33.5 1.62.0 ------- 1.95.0	Colour Granite	GO (3D) No. 69 Ind.(MME-2) Dept. Dt. 20.10.200 8	10.11.2008 to 9.11.2028	12°29'20"N	78°20'20"E
27	Thiru G.Jayapal, S/o Govindaraj, No. 5 C.B.Road, Barugur (po) Krishnagiri	Jagadevi palayam, Krishnagiri Taluk	444/1B, 445	1.30.0 0.52.5 ------- 1.82.5	Colour Granite	GO (3D) No. 66 Ind.(MME-2) Dept. Dt. 6.10.2008	10.11.2008 to 9.11.2028	12°28'00"N	78°21'00"E
28	Thiru S.K.Illiaz Basha, 173-A Yarab Nagar, Iind Stage, Blangalore south, Karnataka State,	Sandanapalli Denkanikottai Tk,	1760/1, 1760/2	0.45.5 0.76.0 -------- 1.21.5	Colour / Black Granite	GO (3D) No. 65 Ind. (MME-2) Dept. Dt. 6.10.2008	10.11.2008 to 9.11.2028	12°28'20.80" N	77°50'23.71" E
29	Thiru S.S Jameeluddin, S/o S.S. Salaluddin, No. 449/1, New Housing Board, II Phase, Krishnagiri 635 001.	Jagadevipala yam, Krishnagiri Taluk	372/3A	1.25.0	Colour Granite	GO (3D) No. 17 Ind.(MME-2) Dept. Dt. 8.4.2008	22.12.2008 to 21.12.2028	12°29'40"N	78°19'40"E
30	Thiru S. Balaji, S/o M. Sakthivel, Bargur Main Road,Jagadevip alayam Village, Krishnagiri -Tk.	Kondappanay anapalli, Krishnagiri Taluk	133/3D1A 133/4A	0.76.0 0.66.0 -------- 1.42.0	Colour Granite	GO (3D) No. 85 Ind.(MME-2) Dept. Dt.17.11. 2008	22.12.2008 to 21.12.2028	12°30'"N	78°21'49"E
31	Thiru S.K.Illiaz Bahsa, 173 A- Yarab Nagar, II nd Stage,Bangalore south, Karnataka State.	Sandanapalli Village Denkanikottai Taluk	1760/3 1760/4	0.87.5 0.34.0 ------- 1.21.5	Colour Granite	GO (3D) No. 98 Ind.(MME-2) Dept. Dt. 01.12.200 8	05.01.2009 to 04.01.2029	12°28'23.18" N	77°50'19.80" E
32	Thiru G. Karthik Ganesh, Plot No. 84 (3)/930 Samanadanapur am, Behind, Sipcot Housing Colony, Hosur, Krishnagiri District.	Sandanapalli Village Denkanikottai Taluk	1762/4 1764/2	0.51.0 0.98.0 -------- 1.49.0	Colour Granite	GO (3D) No. 89 Ind.(MME-2) Dept. Dt. 26.11.200 8	05.01.2009 to 04.01.2029	12°27'56.37" N	77°50'26.63" E

33	Thiru C.Rabeek Raja, S/o V.R. Chellakannu Rowther, 786 Melur, Madurai Dist.	Mahadevakollahalli Pochampalli Taluk	403/2 406/1	1.38.0 0.44.5 ------- 1.82.5	Colour Granite	GO (3D) No. 132 Ind.(MME-2) Dept. Dt. 22.12.2008	02.02.2009 to 01.02.2029	12°23'30"N,	78°21'00"E
34	Thiru M. Jeyapal, S/o Melugugounder, Echankadu Village, Mathur (Post), Pochampalli Taluk, Krishnagiri District.	Alerahalli Kadappasandampatti Pochampalli Taluk	45/2E 754/1A (p)	1.32.0 0.10.0 ------- 1.42.0	Colour Granite	GO (3D) No. 88 Ind.(MME-2) Dept. Dt. 12.12.2007 and GO (RT) No. 92 Ind Dept dt 27.4.2009	12.05.2009 to 11.05.2029	12°22'30"N,	78°23'45"E
35	Tvl. D.K.Rocks, 4/685, Indira Illam, Teachers Colony, Dharmapuri 636 701.	Thimjepalli Denkanikottai Taluk	251/1 (P)	1.07.5	Colour Granite	GO (3D) No. 15 Ind.(MME-2) Dept. Dt. 16.6.2009	13.07.2009 to 12.07.2029	12°32'30.55" N,	77°57'35.51" E
36	Tvl. Jay Granites (p) Ltd, No. 24 Vith Main Road, Kasthuribai Nagar, Adayar, Chennai	Palayamkottai Denkanikottai Taluk	90/5	2.16.5	Colour Granite	GO (3D) No. 10 Ind.(MME-2) Dept. Dt. 26.5.2009 1	13.07.2009 to 12.07.2029	12°29'45.82" N	77°43'29.04" E
37	Tvl. Karthik Granites (p) Ltd, No. 24 Vith Main Road, Kasthuribai Nagar, Adayar, Chennai	Ikondthamkothapalli Krishnagiri Taluk	293/1 294/1A1 294/1A3 294/3A2 294/1B1 294/1C 294/3B 294/3C 295/1B	0.22.0 0.22.0 0.08.0 0.67.5 0.14.0 0.13.5 0.05.0 0.47.0 0.28.5 -------- 2.27.5	Colour Granite	GO (3D) No. 9 Ind.(MME-2) Dept. Dt. 26.5.2009	13.07.2009 to 12.07.2029	12°26'15"N,	78°19'30"E
38	Thiru R. Mahendhar, S/o Ramegowdu, Kundumaranapalli Village, Denkanikottai Taluk, Krishnagiri Dist.	Irudukottai, Denkanikottai Taluk	1105/2 (p), 1105/3 (p)	0.71.0 0.29.0 -------- 1.00.0	Colour Granite	GO (3D) No. 16 Ind.(MME-2) Dept. Dt. 22.6.2009	27.07.2009 to 26.07.2029	12°26'2.29"N,	77°50'8.01"E
39	Tvl. Rayan Exports, Pro. Thiru P. Thimmarayan, No. 10 st Cross, Co- operative colony, Krishnagiri	Mothinayankanpatti Krishnagiri Taluk	3/1B (p) 3/1E1 3/1E2	0.68.0 0.11.5 0.22.5 -------- 1.02.0	Colour Granite	GO (3D) No. 20 Ind.(MME-2) Dept. Dt. 22.7.2009	24.08.2009 to 23.08.2029	12°23'40"N,	78°23'40"E
40	D.Loganathan, 3B 3rd Cross, power house colony, Krishnagiri Taluk & District	Kondappanayanapalli, Krishnagiri Taluk	133/6 133/2B1B	0.88.0 0.60.0 --------- 1.48.0	Colour Granite	GO (3D) No. 25 Ind.(MME-2) Dept. Dt. 19.8.2009	07.10.2009 to 06.10.2029	12°29'20"N,	78°20'20"E

41	Thiru K.P Lakshmanan, S/o Periyasamy Gounder, Kondasamanahalli Thandugarnahalli (po), Palacode Taluk, Dharmapuri District.	Sonarahalli Pochampalli Taluk	840/1 (p)	1.05.0	Colour Granite	GO (3D) No. 36 Ind.(MME-2) Dept. Dt. 09.7.2009	14.12.2009 to 13.12.2029	12°23'43"N,	78°26'44"E
42	Tmt. D. Rukkammal, W/o Duraisamy Naidu, Chendarapalli Village, Anchoor (po) 635 203 Krishnagiri Taluk	Sulamalai Krishnagiri Taluk	335/4A1	1.20.0	Colour Granite	GO (3D) No. 34 Ind.(MME-2) Dept. Dt. 03.10.2009	14.12.2009 to 13.12.2029	12°29'45"N,	78°18'06"E
43	Tvl. Archaean Granites Private Limited, TVH Belkiaa Towers, 5th floor, Phase-II 94 MRC Nagar, Chennai-600 028	Vilangamudi Pochampalli Taluk	360/10 (p) 360/11 (p) 360/13 (p) 369/2A (p)	0.12.0 0.02.5 0.19.0 1.24.0 --- 1.57.5 ---	Colour Granite	GO (3D) No. 37 Ind.(MME-2) Dept. Dt. 09.11.2009	11.01.2010 to 08.01.2030	12°20'42"N,	78°28'24"E
44	R.Sakkubai, M/S. Raj Granites, 9 C K. Srinivasa Rao Street, Dharmapuri Town & Distict.	Puligunda Krishnagiri Taluk	371/1A (p) 371/2 (p) 372 (p) 374/1 375/1 (p) 375/2	0.07.5 0.03.5 0.29.5 0.20.5 0.50.0 0.10.0 --- 1.21.0	Colour Granite	GO (3D) No. 12 Ind.(MME-2) Dept. Dt. 04.03.2010	05.04.2010 to 04.04.2030	12°27'40"N,	78°20'20"E
45	Thiru T. Ekambavanan, 2/488 Selandi Nagar, Krishnagiri	Ikondamkothapalli Krishnagiri Taluk	116/1 (part)	1.21.0	Colour Granite	GO (3D) NO. 26 Ind.(MME 2) Dept Dt. 24.2.2011	28.2.2011 to 27.2.2031	12°27'10"N,	78°19'20"E
46	Tvl. Sakthi Granites (partnerShri N.K. Chinnammal), W/o Late Kandasamy Gounder, No. 36/H5 Thangamapuripattinam, Anna Nagar, Mett5ur Dam, 636 402	Agalakottai Denkanikottai Tk	387/3	1.21.5	Colour Granite	GO (3D) NO. 07 Ind. (MME2) Dept Dt. 3.2.2011	28.2.2011 to 27.2.2031	12°26'55.75" N,	77°40'28.05" E
47	Tvl. Ramachandra Granite& Construction Pvt Ltd, Varaganapalli Village, Nagamangalam Post, Denkanikottai Taluk	Irudukottai, Denkanikottai Taluk	1104/4, 1104/5 (parrt), 1104/6 (part), 1104/8	1.43.0	Colour Granite	GO (3D) No. 04 Ind. (MME2) Dept dt. 25.1.2011	28.2.2011 to 27.2.2031.	12°26'5.34"N	77°50'5.88"E

48	K. Selvam, 248/200, Cheennai Salai, (Near Thiruvallurva Bus stand) Krishnagiri 634 001	Sandanapalli Village Denkanikottai Taluk	1763/1 1763/2 1763/3 1767/1	0.57.5 1.01.5 1.21.0 0.81.0 -------- 3.61.0	Colour Granite	GO (3D) No. 09 Ind.(MME 2) Dept dt. 4.2.2011	28.2.2011 to 27.2.2031	12°27'30.98" N	77°50'46.89" E
49	Thiru A.V. Elamurugu No. 8 Ramakrishnapuram, 30 Ft. Road, Karur Town&DT	Jagadevipalayam Krishnagiri Taluk	372/3B5 372/3B6	0.10.5 0.91.0 -------- 1.01.5	Colour Granite	GO (3D) No. 03 Ind. (MME2) Dept. Dt. 25.1.2011	28.2.2011 to 27.2.2031	12°24'324"N	78°21'455"E
50	Thiru B.K. Murali, S/o B.C.Krishnan No. 70/53, Karakuppam Bargur 635 104	Chendarapalli, Krishnagiri Taluk	382/5A 382/5B 382/6A 382/6B 382/6C 382/7A 382/7B 382/8 382/9A 382/9B 382/9C 382/10 382/11	0.10.0 0.16.5 0.07.5 0.01.5 0.16.0 0.75.0 0.50.0 0.16.5 0.16.0 0.31.5 0.08.0 0.12.5 0.17.5 -------- 2.78.5	Colour Granite	GO (3D) No. 34 Ind. (MME2) Dept. Dt. 25.2.2011	28.2.2011 to 27.2.2031	12°29'20"N	78°18'16"E
51	Thiru K.S.Thanikachalam Thomsanpet, Kaveripattinam, Krishnagiri Taluk	Vilangamudi Pochampalli Taluk	448/1(p) 449/1 449/2 449/3A	0.49.0 0.01.0 0.23.5 0.36.0 ------- 1.09.5	Colour Granite	GO (3D) NO. 10 Ind. (MME 2) Dt. 8.2.2011	28.2.2011 to 27.2.2031	12°21'00"N	78°18'30"E
52	Tmt. S. Naseera, W/o Thiru Syed Ahamed, Jittobanapalli Village, Thogarapalli Post, Krishnagiri Dist	Jagadevipalayam Krishnagiri Taluk	438	1.21.0	Colour Granite	GO (3D) No. 15 Ind. (MME2) Dt. 14.2.2011	28.2.2011 to 27.2.2031	12°29'52"N	78°20'33"E
53	Tmt. R. Sakkubai, M/s. Raj Granite, 9C K. Srinivasa Rao Street, Dharamprui Town and District.	Puligunda Village Krishnagiri Taluk	375/1 (part), 376/1 (part), 376/2B (part), 377/1A, 377/2A 377/1B1 (part)	0.30.3 0.47.3 0.20.2 0.06.0 0.03.0 0.14.5 -------- 1.21.3	Colour Granite	G.O (3D) No. 36 Ind. (MME-2) Dept dated 01.03.2011.	29.8.2011 to 28.8.2031	12°27'40"N	78°20'40"E
54	Thiru D. Loganathan, S/o Durai Samy (late), 3B,3rd Cross, Power house colony, Krishnagiri	Chendarapalli Krishnagiri Taluk	356/1B1 356/2, 356/3B 360/2	0.32.5 0.97.0 0.05.5 0.81.0 -------- 2.16.0	Colour Granite	GO (3D) No.07 Ind (MME2) Dept. Dt. 8.2.2012	12.3.2012 to 11.3.2032	12°29'00"N	78°17'35"E

55	Ganesh Granite, 46/1 Raja Nagar, Salem 636 007	Madakkal Denkanikottai Taluk	761/1 (part) 761/2 (part)	0.97.0 0.73.5 -------- 1.70.5	Colour Granite	GO (3D) No.27 Ind (MME2) Dept. Dt. 24.2.2011	30.4.2012 to 29.4.2032	12°26'31.56" N	77°38'56.12" E
56	P. Kalyani W/o Thiru R. Pannerselvam, 2'c Gee Gee Spring, 318 Lloyds Road, Gopalapuram, Chennai 600 086	Chendarapalli Krishnagiri Taluk	194/1B, 194/1C, 194/3A, 194/3B (P) 195/1A2 195/1B	0.40.0 0.38.0 0.67.5 0.40.0 0.81.0 1.90.5 ------- 4.57.0	Colour Granite	GO (3D) No.09 Ind (MME2) Dept. Dt. 08.5.2012	21.5.2012 to 20.5.2032	12°29'20"N	78°16'45"E
57	Thiru M. Edward Rajapandian, 6/142-2 Thiruvallurval Nagar, 2nd Cross, Krishnagiri 635 001.	Sivampatti & Batrahalli Pochampalli Tk.	137/5 (p) 138 p 422/2 p	0.01.0 0.40.5 0.55.0 --------- 1.56.5	Colour Granite	G.O (3D) No. 10 Ind. (MME-2) Dept. dated 23 .05.2012.	25.6.2012 to 24.6.2032	12°24'00"N	78°26'00"E
58	Thiru K. Sekaran, S/o P.P. Kaverichetty No. 25A Red hills road, D.S-1 Aishwaryam, Kolathur. Chennai 600 099.	Jagadevipalayam Krishnagiri Taluk	367/2N1 362/2N2 (p) 367/2O1 (p)	0.24.5 0.43.0 0.43.0 --------- 1.10.5	Colour Granite	G.O (3D) No. 16 Industries (MME-2) Dept. dated 02 .07.2012.	13.7.2012 to 12.7.2032	12°28'10"N	78°22'20"E
59	Thiru V.P. Arputham, S/o Peramanda Gounder, Veeramalai Village, Pochampalli Taluk, Krishnagiri District	Veeramalai, Pochampalli Tk	281/3 (p)	1.03.0	Colour Granite	G.O (3D) No. 19 Ind. (MME-2) Department dated 03 .07.2012.	13.7.2012 to 12.7.2032	12°21'30"N	78°20'30"E
60	Thiru K.P. Lakshmanan, S/o Periyasamy Gounder, Kondasamanahalli Village, Thandugaranahalli Post, Palacode Taluk 636 808 Dharmapuri District	Kendikampatti Pochampalli Taluk	428/1A 428/1B 429/1A1 (p) 429/1B1A 429/1B1B 430/1C1B(p) 430/1C2A 430/1C2B (p) 430/1C3A 430/1C4 (p)	0.17.5 0.05.0 0.13.0 0.05.0 0.15.5 0.54.0 0.07.0 0.10.0 0.13.0 0.34.0 ------- 1.74.0	Colour Granite	G.O (3D) No.18 Ind. (MME 2) Dept. dated 02.07.2012.	13.7.2012 to 12.7.2032	12°23'30"N	78°26'00"E
61	Thiru O.Ulaganathan, Partner, M/s. Obli Granites, 9/66 Recreation Club Road, Mettur Dam, Salem 636 401	Kondappanayanapalli Krishnagiri Tk	134/1 134/2	1.46.5 0.26.5 -------- 1.73.0	Colour Granite	G.O (3D) No. 6 Industries (MME-2) Department Dated 13.05.2013.	01.07.2013 to 30.06.2033	12°29'25"N	78°20'12"E

62	Thiru A.Sathar, S/o Abdul Gafar, 151/3, Jagadevi Village & Post, Krishnagiri Taluk, Krishnagiri District.	Chendarapalli Krishnagiri Taluk	375/2A 375/2C1 375/2E (p)	0.44.5 0.30.5 0.28.5 ------- 1.03.5	Colour Granite	G.O (3D) No.13 Industries (MME-2) Dept. Dated 03.09.2013 .	07.10.2013 to 06.10.2033	12°29'30"N,	78°28'30"E
63	Syed Irfanullah Hussain, Proprietor, M/s Popular Rocks, 182/368 CSI Church Complex, Bangalore Road, Krishnagiri District	Achamangalam Krishnagiri Taluk	382/1B (par I) 382/1B (part II)	1.62.0 1.15.5 --------- 2.77.5	Colour Granite	G.O (3D) No.11 Industries (MME-2) Dept. Dated 02.09.2013	07.10.2013 to 06.10.2033	12°30'13"N,	78°18'87"E
64	Tvl. Vaigai Granites, No 23, Ponni Nagar, Bye Pass Road, Madurai 625 010.	Irudukottai, Denkanikottai Taluk	1155/1 1156/3 (part) 1156/5	0.16.0 0.81.0 0.47.5 -------- 1.44.5	Colour Granite	G.O (3D) No.18 Industries (MME-2) Dept. Dated 31.10.2013	15.12.2013 to 14.12.2033	12°25'57.54" N,	77°50'24.89" E
65	Thiru R. Palaksha, S/o Ramareddy, Lakshmi Sagar Village, Neralur Post, Anekal Taluk, Bangalore District, Karnataka State	Pasinayanapalli Krishnagiri Taluk	48/2D1 (p) etc	3.38.5	Colour Granite	G.O (3D) No.19 Industries (MME-2) Dept. Dated 21.11.2013	23.12.2013 to 22.12.2033	12°27'40.64" N,	78°21'46.95" E
66	Tvl. A.G.N. Granites, 168, K.A.S. Avenue, Narasothipatty, Salem 636 004	Sivampatti Pochampalli Tk.	547/1B 550/13B 550/14B 55/15	0.70.5 0.11.0 0.22.5 0.07.5 -------- 1.11.5	Colour Granite	G.O (3D) No. 21 Industries (MME-2) Dept. dated 26.11.2013	17.01.2014 to 16.01.2034	12°24'25"N,	78°25'36"E
67	Thiru T.R. Durai Selvam, S/o T.D. Ramamurthy, Thogarapalli Village & Post, Krishnagiri Taluk & Dist.	Puligunda Krishnagiri Tk	1022 (p) 1023/2(p) 1024/2 (p) 1028 (p)	1.25.5 0.12.0 0.40.5 0.24.5 -------- 2.02.5	Colour Granite	G.O (3D) No. 16 Industries (MME-2) Dept. dated 26.05.2014	23.7.2014 to 22.7.2034	12°28'07"N to 12°28'04"N	78°21'32"E to 78°21'28"E
68	Thiru P. Loganathan, 188/2 Govt. Higher Secondary School Road, Denkanikottai Taluk Krishnagiri Dist.	Karandapalli Denkanikottai	152/1B 153/3 153/4B 534/2	0.24.5 0.03.0 0.11.0 0.90.0 --------- 1.28.5	Colour Granite	G.O (3D) No. 15 Industries (MME-2) Dept. dated 26.05.2014	23.7.2014 to 22.7.2034	12°28'20.00" N	77°43'20.19" E
69	Thiru S.A Md. Azmathulla, S/o S.A Md. Amanullah, 5, Mattai Garden, 10th Lane , Idwasher manpet, Chennai 600 021	Ikondhamkothapalli Krishnagiri	59/1A	1.21.0	Colour Granite	G.O (3D) No. 07 Industries (MME-2) Dept. dated 03.03.2014	12.9.2014 to 11.9.2034	12°28'07"N	78°18'57"E

70	Tvl. Mahaboob Shereef, S/o Rasool Shriff, Irudukottai Village, Denkanikottai Taluk, Krishnagiri District.	Irudukottai, Denkanikottai Taluk	1106/1 1123/1	0.98.5 0.22.0 1.20.5	Colour Granite	G.O. (3D) No. 23 Industries (MME.2) Department dated. 27.08.2014	08.10.2014 to 07.10.2034	12°26'0.71"N	77°50'1.89"E
71	S. Kumaravel, S/o Swaminathan, No. 4/109, Thearpettai Village, Thimmapuram Panchayat, Krishnagiri Taluk and District	Soolamalai Krishnagiri Taluk	241/3B 241/4 244/3A 244/3B1 (Part)	0.20.0 0.37.5 0.40.5 0.03.5 --------- 1.01.5	Colour Granite	G.O (3D) No.8 Industries (MME-2) Department Dated 12.03.2015	07.04.2015 to 06.04.2035	12°30'56"N	78°17'33"E
72	Thiru D. Karunanithi, S/o M. Dharman, Valasagoundanoor Vuillage, Puliampatti Post, Pochampalli Taluk, Krishnagiri Dist.	Vilangamudi Pochampalli Taluk	354/4 etc	4.04.5	Colour Granite	G.O (3D) No.15 Industries (MME-2) Department Dated 09.04.2015	28.04.2015 to 27.04.2035	12°20'58"N to 12°20'50"N	78°18'05"E to 78°17'52"E
73	Thiru S. Ramachandran, Prop: M/s.Sand Rock Impex, Old No. D/364, New No. d/11. karakaliamman Koil Street, Anna Nagar Tennur, Trichy-17	Nagojanahalli, Pochampalli Taluk	503/2 (p)	1.20.5	Colour Granite	G.O (3D) No.23 Industries (MME-2) Department Dated 27.04.2015	11.05.2015 to 10.05.2035	12°21'48"N to 12°21'53"N	78°17'51"E to 78°17'55"E
74	Thiru D. Dhanapal, S/o Duraisamy Udayar, 7/395 Melbatchapet, Harur Post Taluk.	Nagojanahalli, Pochampalli Taluk	741/8B, 742/2, 743/2	0.20.5 0.86.5 0.61.0 ------- 1.68.0	Colour Granite	G.O (3D) No.10 Industries (MME-2) Department Dated 01.04.2015	13.05.2015 to 12.05.2035	12°22'35.02" N,	78°16'53.99" E
75	Thirumalai Alagar Exports, New No. 7,Old No. 2, Sripuram Second Street, Royapettah, Chennai 600 014.	Soolamalai Krishnagiri Taluk	328 (part)	1.80.0	Colour Granite	G.O (3D) No.16 Industries (MME-2) Department Dated 10.04.2015	14.05.2015 to 13.05.2035	12°29'50"N,	78°18'00"E
76	Thiru K.R. Rajendiran, S/o K.K.Rajappa Goundar, 3/5 Krishnappa Chetty Layout, Mew colony, Krishnagiri.	Nagojanahalli, Pochampalli Taluk	332 (p)	1.00.0	Colour Granite	G.O (3D) No.17 Industries (MME-2) Department Dated 10.04.2015	14.05.2015 to 13.05.2035	12°22'00"N,	78°19'45"E

77	Thiru V. Jayaprakash, S/o Venkatesh, No. 301, HIG, Phase 10, New Temple Land, HUDCO, Rayakottai Road, Hosur, Krishnagiri District.	Irudhukottai Denkanikottai	1158/8 1158/9, 1160/3A 1160/4 1161/2 (p) 1161/3 (), 1161/4A (P) and 1166/5 (p)	0.33.0 0.09.5 0.81.5 0.11.5 0.64.5 0.20.0 0.20.0 0.04.0 0.45.0 ------- 3.21.5	Colour Granite	G.O (3D) No. 29 Ind (MME-2) Dept dt 29.10.2015.	18.11.2015 to 17.11.2035	12°25'47.24" N,	77°50'33.63" E
78	Tmt. C. Prabha, W/o K.C. Damodharan, 3/65, Karichipalayam, Vettayankinaru Village, Perundurai Taluk, Erode District.	Karandapalli Denkanikottai	511/1	2.11.5	Colour Granite	G.O (3D) No. 31 Industries (MME-2) Department dated 11.11.2015	07.12.2015 to 06.12.2035	12°27'28.18" N,	77°42'46.45" E
79	R.Sakkubai, M/S. Raj Granites, 9 C K. Srinivasa Rao Street, Dharmapuri Town & Distict.	Puligunda Krishnagiri	370 (p) 376/2A1 377/1B2 377/2B2 377/3A 377/3B	0.85.0 0.17.0 0.38.0 0.42.0 0.12.0 0.10.5 -------- 2.04.5	Colour Granite	G.O (3D) No. 39 Ind (MME-2) Dept. dt 24.11.2015 .	07.12.2015 to 06.12.2035	12°27'40"N,	78°20'20"E
80	Thiru V.P. Arputham, S/o Peramanda Gounder, Veeramalai Village, Pochampalli Taluk, Krishnagiri District	Veeramalai, Pochampalli Tk	274/2A2 275/2B 282/2A2 281/4 281/3 (p)	1.03.0 0.45.0 0.03.5 0.37.0 0.61.0 --------- 2.49.5	Colour Granite	G.O (3D) No. 43 Ind (MME-2) Dept. dt 27.11.2015 .	16.12.2015 to 15.12.2035	12°21'29"N to 12°21'37"N	78°20'05"E to 78°20'12"E
81	Thiru V. Venu S/o B.C. Venkatappan, No. 80, Ist Cross, 5th Main 37/3 K. Krishnagiri Road, Bargur 635 104, Krishnagiri Taluk and District	Pasinayana palli Krishnagiri Taluk	5	2.35.0	Colour Granite	G.O (3D) No. 42 Ind (MME-2) Dept. dt 27.11.2015 .	16.12.2015 to 15.12.2035	12°28'53"N to 12°28'59"N	78°21'44"E to 78°21'50"E
82	Tmt. V. Bhuvaneswai, W/o A. Vinayagam, No.1/96,Jagadevipalayam,Krishnagiri Tk & Dist.	Jagadevipalayam Krishnagiri Taluk	40 8/11	1.62.0	Colour Granite	G.O (3D) No. 41 Ind (MME-2) Dept. dt 27.11.2015 .	16.12.2015 to 15.12.2035	12°28'05"N to 12°28'11"N	78°20'37"E to 78°20'46"E
83	Thiru D.Dhanapal, S/o Duraisamy Udayar, 7/395, Melbatchapet, Harur Post & Taluk, Dharmapuri -Dt	Sandanapalli Denkanikottai	1753/1 (p) 1753/2 (P)	0.73.5 0.97.0 ------- 1.70.5	Colour Granite	G.O (3D) No. 40 Ind (MME-2) Dept dt. 24.11.2015	08.01.2016 to 07.01.2036	12°28'18.59" N	77°50'23.29" E

84	Thiru D. Karunanithi S/o M. Dharman, Valasagoundanoor Village, Puliyampatti Post, Pochampalli Taluk, Krishnagiri District 635 206.	Irudukottai Denkanikottai	1114/2 (), 1114/3 (P) 1114/4 (), 1110/2A (p) 1116/1 (p)	1.02.5 1.23.0 0.53.5 0.24.0 0.60.5 -------- 3.63.5	Colour Granite	G.O (3D) No. 45 Ind (MME-2) Dept. dt 10.12.2015.	08.01.2016 to 07.01.2036	12°27'38.35" N,	77°46'58.28" E
85	Thiru A. Abdul Salam, S.o, N. Abdul Jabar, NO. 920 Alasandham Road, Hosur 535 109	Jagadevipalayam Krishnagiri Taluk	437(p)	2.30.0	Colour Granite	G.O (3D) No. 48 Ind (MME-2) Dept. dt 30.12.2015.	08.01.2016 to 07.01.2036	12°28'25"N to 12°28'31"N	77°20'15"E to 77°20'22"E
86	M/s. Balaji Land promoters (p) Ltd 358 Ganapthi Colony, 2nd Steet, Ekkattuthangal, Chennai -32	Veeramalai, Pochampalli Tk	416/2A 417/2B	0.27.0 1.75.5 -------- 2.02.5	Colour Granite	G.O (3D) No. 24 Ind (MME-2) Dept. dt 15.02.2016.	29.02.2016 to 28.02.2036	12°21'29"N to 12°21'38"N	77°20'17"E to 77°20'21"E
87	Thiru K.Krishnan, S/o Kannappan, No. 14 A Obey Palayam, Agaram Post, Hosur Taluk Krishnagiri District.	Nagamangalam Denkanikottai	1202/1C 1202/B 1203/1 1203/4	0.64.0 0.46.0 2.16.5 0.10.0 --------- 3.36.5	Colour Granite	G.O (3D) No. 12 Ind (MME-2) Dept. dt 25.01.2016.	29.02.2016 to 28.02.2036	12°35'42.77" N,	77°55'18.10" E
88	Thiru D. Mathiyazhagan, S/o K.M. Devaraj, 58-B Gandhi Nagar, Krishnagiri 635 001	Irudukottai Denkanikottai	1158/4 1158/5 1162/1 1162/2 1162/3 1162/4 1162/5 1163/6 1163/7 1165/1	1.21.0 0.27.5 0.94.5 0.45.5 0.78.5 1.14.0 0.49.5 0.60.0 0.33.0 0.32.0 ------- 6.55.0	Colour Granite	G.O (3D) No. 20 Ind (MME-2) Dept. dt 12.02.2016.	03.03.2016 to 02.03.2036	12°35'42.77" N,	77°55'18.10" E
89	Thiru P. Ganesan, S/o Perumal Gounder, No. 2/36 Gundalpatty, Hale Dharmapuri Post, Dharmapuri Dist.	Karandapalli Denkanikottai	59/2B 59/3A 59/3B 60/2A 60/3A	0.40.5 1.42.0 0.40.0 0.40.5 0.81.0 ------- 3.44.5	Colour Granite	G.O (3D) No. 30 Ind (MME-2) Dept. dt 19.02.2016.	29.02.2016 to 28.02.2036	12°27'36.96" N,	77°42'46.99" E
90	Thiru S. Venkatesan, S/o Subbam No. 26/1 C.B. Road Bargur Post, Krishnagiri Taluk & Dist.	Jagadevipalayam Krishnagiri Taluk	9 (p)	3.22.0	Colour Granite	G.O (3D) No. 31 Ind (MME-2) Dept. dt 22.2.2016.	04.03.2016 to 03.03.2036	12°29'33.50" N	78°18'39.05" E

91	Tmt. J. Sivakami S/o (Late) G. Jayapal, No. 43/2 Hospital Road, Bargur Post, Krishangiri Taluk & Dist.	Jagadevipalayam Krishnagiri Taluk	421/8 (p) 421/9 444/1A(p) 444/1B (p) 445 (p)	0.27.0 0.09.0 1.78.0 0.10.0 0.99.0 --------- 3.23.0	Colour Granite	G.O (3D) No. 32 Ind (MME-2) Dept. dt 22.2.2016.	04.03.2016 to 03.03.2036	12°28'31.31" N	78°20'30.01" E
92	Thiru A. Nazeer, S/o Andal Azeez, NO. 15 464/1, Saravanapuram, Chitoor District. Andhrapradesh 517 002	Achamangalam Krishnagiri Taluk	382/1A1B 382/1B1C	2.52.0 1.41.5 -------- 3.93.5	Colour Granite	G.O (3D) No. 27 Ind (MME-2) Dept. dt 15.2.2016.	03.03.2016 to 02.03.2036	12°30'03"N to 12°30'12"N	78°19'44.40" E to 78°19'50.48" E
93	Tvl. S.M. Exports Prop. K. Madhiyan, NO. 2,A2, 3rd Cross, Gopalakrishna Colony, Krishnagir 635 001.	Kondappanayanapalli Krishnagiri Tk	116/2A2 (p) 110/3A(p) 110/3B1	0.15.0 0.98.0 0.13.0 --------- 1.26.0	Colour Granite	G.O (3D) No. 26 Ind (MME-2) Dept. dt 25.2.2016.	29.02.2016 to 28.02.2036	12°29'57"N to 12°30'02"N	78°20'02"E to 78°20'07"E
94	Thiru A.V. Elamurugu No. 8 Ramakrishnapuram, 30 Ft. Road, Karur Town, Karur District.	Jagadevipalayam Krishnagiri Taluk	372/3B (p) 372/3B4 (p) 372/3B5 (p) 377/1A (p)	0.50.0 0.35.0 0.33.0 1.24.0 -------- 2.42.0	Colour Granite	G.O (3D) No. 19 Ind (MME-2) Dept. dt 12.02.2016	29.02.2016 to 28.02.2036	12°28'17"N to 12°28'25"N	78°21'20"E to 78°21'30"E
95	Thiru A.Ameed S/o Abdul Gaffar, Jagadevipalayam Krishnagiri Taluk	Chendarapalli Krishnagiri Taluk	377/1B 378/2 377/2A 378/1 377/2B 377/1A1B 377/1A2	0.78.5 0.40.5 0.48.0 0.40.5 0.48.5 0.16.0 0.13.5 -------- 2.85.5	Colour Granite	G.O (3D) No. 25 Ind (MME-2) Dept. dt 15.02.2016	03.03.2016 to 02.03.2036	12°29'27"N to 12°29'35"N	78°18'26"E to 78°18'35"E
96	Tmt. Mariam Banu, W/o Mir Zasim Ali, No. 1/192 Muslim Masuthi St,Jagadevipalayam Village & PostKrishnagiri Taluk & Dist.	Chendarapalli Krishnagiri Taluk	378/3 379/7 379/8	3.47.5 0.02.0 0.40.5 -------- 3.90.0	Colour Granite	G.O (3D) No. 28 Ind (MME-2) Dept. dt 15.02.2016	01.03.2016 to 29.02.2036	12°29'22"N to 12°29'32"N	78°18'29"E to 78°18'36"E
97	Tvl. M.P. Granties, No. 131/29, R.R. Complex,Kollapatti, Animoor Post, Tiruchengode 637 211 Namakkal Dist.	Jagadevipalayam Krishnagiri Taluk	266/1 268/1AC 268/1AD	0.75.5 0.46.0 0.64.0 -------- 1.85.5	Colour Granite	G.O (3D) No. 07 Ind (MME-2) Dept. dt 18.01.2016	03.02.2016 to 02.02.2036	12°28'23"N to 12°28'29"N	78°21'05"E to 78°21'13"E

98	Thiru N. Richapal Singh, S/o Narayan Lal Plsaniya, Raghunathpura Village, Dantaramgarth Taluk Sikar District Rajasthan 332 023	Sivampatti Pochampalli	65 69/4 120/1B 122/1A1 123/1A	1.20.0 0.26.0 0.06.0 0.54.0 0.12.0 ------- 2.18.0	Colour Granite	G.O (3D) No. 06 Ind (MME-2) Dept. dt 18.01.2016	03.02.2016 to 02.02.2036	12°23'49"N to 12°23'59"N	78°26'00"E to 78°26'05"E
99	Thiru P. Loganathan, 188/2 Govt. Higher Secondary School Road, Denkanikottai Taluk Krishnagiri Dist.	Agalakottai Denkanikottai Tk	623/1 (p) 623/2 (p)	0.14.0 0.86.0 -------- 1.00.0	Colour Granite	G.O (3D) No. 03 Ind (MME-2) Dept. dt 07.01.2016	03.02.2016 to 02.02.2036	12°26'32.40" N,	77°41'27.78" E
100	M/s. Bhairava Granites, Kondappanayanapalli Village, Bargur Taluk, Krishnagiri District.	Chendarapalli Bargur Taluk	176/2	2.01.5	Colour Granite	G.O. (3D) No. 38 Ind. (MME-2) Dept. Dt. 19.07.2016	10.08.2016 to 09.08.2036	12°29'38"N to 12°29'44"N	78°17'30"E to 78°17'34"E
101	M/s.Sand Rock Impex, Old No. D/364, New No. D/11, Ukkarakaliamman Koil Street, Anna Nagar, Thennur, Trichy District.	Nagojanahalli, Pochampalli Taluk	170/1 497/1 498/2 503/2A	0.40.5 0.29.0 0.12.0 2.43.5 -------- 3.25.0	Colour Granite	G.O. (3D) NO. 51 Ind. (MME-2) Dept. Dt. 28.07.2016.	17.08.2016 to 16.08.2036	12°21'47"N to 12°21'57"	78°17'49"E to 78°17'58"E
102	S. Ramesh, M/s. Goodluck Exports, 1/118, Bargur Main Road, (opp.) Co-op Bank, Jagadevipalayam Village & Post, Krishnagiri Taluk & District.	Puligunda Krishnagiri Taluk	168/1 (p) 169/1 169/2 181/1C1(p)	0.28.5 1.04.5 0.94.5 0.13.5 -------- 2.41.0	Colour Granite	G.O (3D) No. 39 Ind. (MME-2) Dept. Dt. 19.07.2016	17.08.2016 to 16.08.2036	12°24'56.27" N to 12°25'02.15"	78°21'03.06" E to 78°21'10.80" E
103	M.S. Prabhu, S/o M.P Sathiyamurthy, Old No. 9, New No. 16,2nd street, Bakthavatchalam Nagar, Adyar, Chennai - 20	Mahadevakollahalli Pochampalli Taluk	389 (p) 398 (p)	0.53.0 1.66.0 ------- 2.19.0	Colour Granite	G.O (3D) No. 56 Ind. Dept. Dt 29.7.2016	22.08.2016 to 21.08.2036	12°26'22"N to 12°26'28"N	78°19'41"E to 78°19'49"E
104	Thiru A.Sathar, S/o Abdul Gafar, 151/3, Jagadevi Village & Post, Krishnagiri Taluk, Krishnagiri District.	Chendarapalli Krishnagiri Taluk (now Bargur)	375/2D 375/3 375/2E (p) 377/1A1 (p)	0.26.5 0.77.5 0.22.5 0.51.5 ------ 1.78.0	Colour Granite	G.O (3D) No.48 Ind. (MME.2) Dept. Dated 25.07.2016	01.9.2016 to 31.8.2036	12°29'28"N to 12°29'30"	78°18'20"E to 78°18'26"E

105	T.D.Kumaraguru, S/o T.R. Duraiselvam, Thogarapalli Village & Post, Bargur Taluk, Krishnagiri District.	Puligunda Bargur Taluk	337 (p) 338	0.20.2 1.81.5 -------- 2.01.5	Colour Granite	G.O (3D) No. 55 Ind. (MME-2) Dept. Dt. 29.07.2016.	07.9.2016 to 06.09.2036.	12°25'37"N to 12°25'44"	78°21'28"E to 78°21'34"E
106	M.P.Mining and Leasing Company, No. 2/226, Karisalkulam Road, Vakkanangundu, Kariyapatti Taluk, Virudhunagar District.	Jagadevipalayam Bargur Taluk	268/1Y, 268/1Z, 268/2K 268/1AB	0.46.0 0.84.0 0.12.0 0.42.0 --------- 1.84.0	Colour Granite	G.O (3D) No. 72 Ind. (MME-2) Dept. Dt. 01.12.2016	10.02.2017 to 09.02.2037.	12°28'25.42" N to 12°28'33.04" N	78°21'00.16" E to 78°21'05.59" E
107	Thiru A. Perumal S/o Ayothi, 4/66B, Madarahalli Village and Post, Pochampalli (Now Bargur) Taluk, Krishnagiri District	Bargur Sivampatti	131/1B2 (p) 136/2 144/1 144/2 145/1 145/2	0.20.0 0.41.5 0.37.0 1.06.0 0.34.5 0.62.5 ------- 3.01.5 -------	Colour Granite	G.O (3D) No 04 Industries (MME.2) Department Dated 21.06.2017	21.08.2017 to 20.08.2037	12°24'25"N,	78°25'36"E
108	Tvl. Zak Exports, No. 35/13, 2nd Cross Co-operative Colony, Krishnagiri Taluk and District	Bargur Taluk Chendarapalli Vil	380/1 (part)	3.50.0	Colour Granite	G.O (3D) No 25 Industries (MME.2) Department Dated 21.11.2017	06.12.2017 to 05.12.2037	12°29'21.31" N to 12°30'29.32" N	78°18'18.31" E to 78°18'18.26" E
109	Thiru S. Shajahan, S/o Shamohamed, D.No. 1/390 Jagadevipalayam Post, Bargur Taluk, Krishnagiri Dist.	Bargur Taluk Soolamalai	293/2	2.06.0	Colour Granite	G.O (3D) No 26 Industries (MME.2) Department Dated 21.11.2017	06.12.2017 to 05.12.2037	12°30'19.78" N to 12°30'27.27" N	78°17'40.20" E to 78°17'45.65" E
110	M. Gnanam, S/o Mariappan, 6/145 Theerthagiri Nagar, Palacode 636 808 Dharmapuri District.	Denkanikottai Taluk Thavarakarai	905/1, 905/2 (p)	1.21.5 1.21.0 -------- 2.425.	Colour Granite	G.O (3D) No 28 Industries (MME.2) Department Dated 01.12.2017	14.01.2018 to 13.02.2038	12°29'21. 75 "N,	77°43'58. 23" E
111	B.S.Ravi S/o B.C. Subban No. 142/1, Srikrishna Complex, Krishnagiri Main Road, Bargur Taluk	Bargur Taluk Chendarapalli	405/1B1A2 405/1B2	1.40.0 1.62.0 -------- 3.02.0	Colour Granite	G.O (3D) No 15 Industries (MME.2) Department Dated 19.3.2018	25.04.2018 to 24.04.2038	12°28'48. 72 "N,	78°18'26. 05" E

112	T.Velu, S/o Thangasamy, 105 13th Cross, 22nd Main, Rajavendra Colony, Padmanabha Nagar, Bangalore	Pochampalli Taluk Sivampatti	4/4A, 4/4B, 4/4C, 5/2B (p) 5/3B (p) 5/5A (p)	0.33.0 0.16.0 0.30.0 0.50.0 0.04.5 0.01.0 -------- 1.34.5	Colour Granite	G.O (3D) No 21 Industries (MME.2) Department Dated 22.03.2018	20.4.2018 to 19.04.2038	12°24'09. 35 "N,	78°25'11. 65" E
113	Siva Granite Products, No. 11 Ramakrishna Road, Salem 636 007	Hosur Taluk Thiyanadurgam	1052/1	2.02.0	Colour Granite	G.O (3D) No 19 Industries (MME.2) Department Dated 22.03.2018	18.04.2018 to17.04.2038	12°36'55. 42 "N,	77°53'57. 60" E
114	Everking Granite No. 1/161, TNHB, Phase-II, Krishnagiri 635 002	Bargur Taluk Jagadevipalayam	347/1 347/2 347/4 347/5 348/4 348/5 348/6B1 348/6C 348/6D1	0.33.0 0.65.0 0.23.5 1.06.0 0.32.0 0.20.0 0.16.2 0.10.5 0.13.3 -------- 3.19.5	Colour Granite	G.O (3D) No 20 Industries (MME.2) Department Dated 22.03.2018	28.05.2018 to 27.05.2038	12°28'40. 61 "N,	78°21'6. 86" E
115	Tmt. M. Varalakshmi, W/o C. Munirathinam, Chendarapalli, Anchoor (post) Krishnagiri Dist.	Bagur Taluk Soolamalai	335/4B 341/4	0.48.0 0.60.5 -------- 1.08.5	Colour Granite	G.O (3D) No 24 Industries (MME.2) Department Dated 16.04.2018	14.06.2018 to 13.06.2038	12°39'33 "N,	78°18'08" E
116	Tvl. Sri Lakshmi Enterprises, 11/7 Krishnappa Layout, Co-operative Colony, Krishnagiri 635 001	Pochampalli Taluk Kadappasandam patti	71/1 (part)	1.00.0	Colour Granite	G.O (3D) No 25 Industries (MME.2) Department Dated 20.04.2018	25.06.2018 to 24.06.2038	12°29'21.31 "N,	78°18'26.31" E
117	Thiru E. Jagadeesan S/o Egananthan, No. 5/50 Thiruvallur Nagar, Krishnagiri Town and Taluk	Bargur Taluk Jagadevipalayam	353/2A1B	1.56.5	Colour Granite	G.O (3D) No 42 Industries (MME.2) Department Dated 20.09.2018	09.11.2018 to 08.11.2038	12°28'34. 91 "N,	78°21'11. 18" E
118	Thiru J. Kasinathan, S/o Jayapal, 52 B Venkatraman, Moopankottai, Eachankadu Village, Mathur Post, Pochampalli Taluk, Krishnagiri Dist.	Pochampalli TK Kendikampatti	435/1A (p)	1.24.0	Colour Granite	G.O (3D) No 44 Industries (MME.2) Department Dated 16.10.2018	27.11.2018 to 26.11.2038	12°22'14. 8 "N,	78°24'04. 96" E

119	Thiru D. Dhanapal, S/o Duraisamy Udayar, 7/395 Melbatchapet, Harur Post Taluk.	Pochampalli Taluk Vilangamudi Village	542/1B etc	2.06.5	Colour Granite	G.O (3D) No 45 Industries (MME.2) Departme nt Dated 12.10.201 8	27.11.2018 to 26.11.2038	12°20'20. 13 "N,	78°18'09. 87" E
120	TamilNadu Minerals Ltd, Chennai	Chendarapalli Krishnagiri Taluk	381 368	1.78.5 4.08.0 -------- 5.86.5 ------	Colour Granite	G.O Ms No. 237 Ind. Dept. Dated 17.3.99.	21.6.99 to 20.6.2019	12°30'00"N,	78°18'30"E
121	TamilNadu Minerals Ltd, Chennai	Soolamali Krishanagiri Taluk	283 247	34.35.5 20.87.0 ---------- 55.22.5 ----------	Colour Granite	GO.Ms. No. 268 Ind.Dept. Dated 30.3.99	21.6.99 to 20.6.2019	12°30'00"N,	78°17'48"E
122	TamilNadu Minerals Ltd Chennai	Jakkery Denkanikottai Tk	486/1,2 736/4	25.40.0 4.64.5 ------- 27.04.5	Colour Granite	G.o Ms No. 238 Ind.Dept. Dated 17.3.99.	21.6.99 to 20.6.2019	12°34'33.66" N,	77°52'57.67" E
123	TamilNadu Minerals Ltd, Chennai	Chendarapalli , Krishnagiri Taluk	409(p)	36.47.0	Colour Granite	GO.3D No. 40 Ind.Dept. Dated 21.10.2002	18.11.2002 to 17.11.2032	12°12'02"N,	78°17'04"E
124	TamilNadu Minerals Ltd, Chennai -5.	Nagojanahalli , Pochampalli Taluk	331/1P	7.16.5	Colour Granite	GO.3D No.31 Ind.Dept. Dated 21.08.2002	18.11.2002 to 17.11.2032	12°12'02"N,	78°17'04"E
125	TamilNadu Minerals Ltd Chennai	Nellumar Agraharam Denkanikottai Tk	105/2 115/1 115/2 115/3	2.59.0 1.37.5 1.04.5 0.30.5 -------- 5.31.5 --------	Colour Granite	G.o Ms No. 113 Ind.Dept. Dated 06.9.2005	21.11.2005 to 20.11.2035	12°32'46.97" N,	77°36'39.77" E
126	TamilNadu Minerals Ltd Chennai	Thatrahalli Krishnagiri Tk,	391 (p)	4.77.5	Colour Granite	G.o. (3D) No. 67 Ind. (MME-1) Dept. Dt. 05.12.2011	12.3.2012 to 11.3.2042	12°18'58"N,	78°14'24"E
127	TamilNadu Minerals Ltd Chennai	Chendarapalli Bargur Tk,	176/1	15.23.5	Colour Granite	G.O (3D) No. 32 Industries (MME-1) Departmen t dated 15.06.2018	29.12.2018 to 28.12.2038	12°29'25.49" N,	78°17'58. 95"E

c) Details of Existing Colour granite quarry leases granted in Government land under erstwhile Rule 39 of TNMMCR,1959 (operated as per the Hon'ble High Court order issued in batch case in W.P No.25401/03 etc dated 6.9.2007).

Sl. No	Name and Address of the lessee	Taluk and Village	S.F.No.	Extent	Name of the Mineral	File No. and Date	Lease period	Co-ordinates	
								Latitude	Latitude
1	J. Premalatha, Tvl. R.V. Granite, 77-A Ram Nagar, Rani Illam, Kumarasami patti, Salem -7.	Modikuppam (v) Krishnagiri Tk.	95 (p)	1.62.0	Colour Granite	G.O.3D No 221 Ind Dept. Dt.19.7.95	3.8.95 to 2.8.2005	12°27'00"N,	78°18'00"E
2	Tvl.Global Trading Company, 5,IIIrd Floor rosy tower, No. 7 Nungambakkam High Road, Chennai 34.	Nagamangalam (v) Denkanikottai Tk.	629 (p)	2.02.5	Colour Granite	G.O.3D No 96 Ind Dept. Dt.2.5.95	19.5.95 to 18.5.2005	12°34'27.41" N,	77°55'14.66 "E
3	Tvl. Indira Granite, No. 7 Cause way road, Lakshmi mansion, Gugai, Salem 636 006.	Nagamangalam (v) Denkanikottai Tk.	629 (p)	0.81.0	Colour Granite	G.O.3D No 821 Ind Dept. Dt.24.4.95	6.5.95 to 5.5.2005	12°34'34.04" N,	77°55'13.78 "E
4	Tvl. K.M.B. Granite, 4/59 Bharathi Street, Swarnapuri Five Road, Salem 4.	Jakkeri (v) Denkanikottai Tk.	374/5 (p)	1.62.0	Colour Granite	G.O.3D No 301 Ind Dept. Dt.5.10.95	21.10.95 to 20.10.05	12°34'22.82" N,	77°52'48.38 "E
5	Tmt. S.Sumathi, W/o K. Singaram, Morappur, Harur Taluk.	Madakkal (v) Denkanikottai Tk.	1 (p)	1.21.5	Colour Granite	G.O.3D No 232 Ind Dept. Dt.25.7.95	25.8.95 to 24.8.2005	12°26'14.61" N,	77°38'56.59 "E
6	Tmt. S.Sumathi, W/o K. Singaram, Morappur, Harur Taluk.	Marichettihalli (v) Krishnagiri Tk	243 (p)	0.81.0	Colour Granite	G.O.3D No 231 Ind Dept. Dt.25.7.95	30.8.95 to 29.8.2005	12°22'20"N,	78°17'00"E
7	Tvl.Enterprising Enterprises B 25A 50th St, Ashok Nagar, Chennai 83.	Chendarapalli (v) Krishnagiri Tk.	401 (p)	4.05.0	Colour Granite	G.O.3D No 86 Ind Dept. Dt.24.4.95	15.5.95 to 14.5.2005	12°27'00"N,	78°16'20"E
8	A.Anbaruvi, No. 16A Chinniah St, T.Nagar, Chennai 17.	Nagojanahalli (v), Pochampalli Tk.	774 (p)	2.02.5	Colour Granite	G.O.3D No 94 Ind Dept. Dt.2.5.95	16.5.95 to 15.5.2005	12°22'30"N,	78°17'00"E
9	P. Jeyaraj, S/o Pachiappa Gounder, 178/B2 Plot No. 9 1st cross, Nedunchalai Nagar, Salem.	Jagadevi palayam (v) Krishnagiri Tk.	57/1 (p)	0.40.5	Colour Granite	G.O.3D No 230 Ind Dept. Dt.25.7.95	9.8.95 to 8.8.2005	12°29'03."N	78°18'54"E

10	B. Shanmugam, 49 A Pennagaram Road, Kumarasamy pet, Dharmapuri.	Nagamanglam (v) Denkanikottai Tk.	629 (p),	1.21.5	Colour Granite	G.O.3D No 100, Ind Dept. Dt.2.5.95	11.5.95 to 10.5.2005	12°34'25.91" N,	77°55'21.56 "E
11	Tvl. Imperial Granite, No. 59 Cathedral Road, Chennai 86	Nallur(v), Denkanikottai Tk.	454/ 4 (p)	2.02.5	Colour Granite	G.O.3D No 77 Ind Dept. Dt.24.4.95	9.5.95 to 8.5.2005	12°30'21.08" N,	78° 0'28.12"E
12	Tvl. Gem Granite, No. 58 Cathedral Road, Chennai -86.	Nagamangalam (v), Denkanikottai Tk.	629 (p)	3.04.0	Colour Granite	G.O.3D No 79, Ind Dept. Dt.24.4.95	10.5.95 to 9.5.2005	12°34'28.22" N,	77°55'22.27 "E
13	C.Krishnappa Gounder, No. 337 Bangalore Road, Krishnagiri.	Nagojanahalli (v) Pochampalli Tk.	609/ A (p)	2.02.5	Colour Granite	G.O.3D No 115 Ind Dept. Dt.2.5.95	9.5.95 to 8.5.2005	12°22'30"N,	78°17'00"E
14	A. Latha, No. 23 II Floor, Mathajee Shopping complex, Waltters lane, Chennai -2.	Marichettihalli (v) Krishnagiri Tk.	243 (p)	2.02.5	Colour Granite	G.O.3D No 102, Ind Dept. Dt.2.5.95	9.5.95 to 8.5.2005	12°21'57"N,	78°18'25"E
15	M.D. Anandan, No. 73 Gowdiyamutt Road, Rayapettah, Chennai 14.	Nagmangalam (v) Denkanikottai Tk.	692 (p)	0.81.0	Colour Granite	G.O.3D No 321 Ind Dept. Dt.8.11.96	17.3.96 to 16.3.2006	12°34'50.02" N,	77°55'33.49 "E
16	B.C. Krishnan, S/o B.G. Chennuchetty, 88-Gandhi Bazaar, Bagur, Krishnagiri Taluk.	Jagadevi palayam (v), Krishnagiri Tk.	477/ 3	0.40.5	Colour Granite	G.O.4D No 13 Ind Dept. Dt.3.4.96	4.4.96 to 3.4.2006	12°29'03."N	78°18'54"E
17	J. Premalatha, Tvl. R.V. Granite, 77-A Ram Nagar, Rani Illam, Kumarasami patti, Salem -7	Jakkeri (v), Denkanikottai Tk.	201 (p)	1.62.0	Colour Granite	G.O.3D No 201 Ind Dept. Dt.12.7.95	3.8.95 to 2.8.2005	12°34'30.43" N,	77°52'57.26 "E
18	J. Premalatha, Tvl. R.V. Granite, 77-A Ram Nagar, Rani Illam, Kumarasami patti, Salem -7	Nagamangalam(v) Denkanikottai Tk.	629 (p)	0.81.0	Colour Granite	G.O.3D No 322 Ind Dept. Dt.8.11.95	14.12.95 to 13.12.2005	12°34'35.93" N,	77°55'27.84 "E
19	Tvl. Evershine Granite, Lakshmipuram, Kuppam 517 425 (A.P.).	Chendarapalli (v), Krishnagiri Tk.	141 (p)	1.21.5	Colour Granite	G.O.3D No 131 Ind Dept. Dt.15.5.95	7.6.95 to 6.6.2005	12°29'30"N,	78°17'05"E
20	A.Rajamani, Tvl.Mahalakshmi Enterprises, 7th 1st street, North Gopalapuram, Chennai -86.	Nagamangalam (v) Denkanikottai Tk.	629 (P)	2.02.5	Colour Granite	G.O.3(D) No 80 Ind Dept. Dt.24.4.95	6.5.2005 to 5.5.2005	12°34'24.46" N,	77°55'16.32 "E
21	Rani Granite, 33 1St Puliguthi Street, Gugai, Salem.	Nagamangalam (v) Denkanikottai Tk.	629 (p)	4.05.0	Colour Granite	G.O.No 197 (MMG1) Ind Dept Dt. 1.6.93	16.6.93 to 15.6.2003	12°34'19.00" N,	77°55'17.74 "E

22	Sakthi Enterprises, 165 B Kamarajar Road, Attur 636 102, Salem Dist.	Sellakuttapatti (v) Pochampalli Tk.	197	3.93.0	Colour Granite	G.O.No 197 (MMG1) Ind Dept Dt. 1.6.93	16.6.93 to 15.6.2003		
23	A. Gopinath, Medumuthukottai,, Balathotanapalli (po), Denkanikottai Taluk	Agalakottai (v) Denkanikottai Tk.	463 etc.	2.73.5	Colour Granite	G.O.3D No 162 Ind Dept. Dt.6.6.95	28.6.95 to 27.6.2005	12°26'29.45" N,	77°42'5.00" E
24	A. Latha, No. 23 II Floor, Mathajee Shopping complex, Waltters lane, Chennai -2.	Nagojanahalli (v) Pochampalli Tk.	609/ A	0.81.0	Colour Granite	G.O.3D No 9 Ind Dept. Dt.2.4.96	6.5.96 to 5.5.2006	12°22'30"N,	78°17'50"E
25	P.K. Pounraj, Tvl. Sathiya Granites, No. 9A Athiyaman Complex, Bye Pass road, Dharmapuri-1.	Agalakottai (v) Denkanikottai Tk.	477/ 1 (p)	1.01.5	Colour Granite	G.O.3D No 353 Ind Dept. Dt.7.12.95	30.12.95 to 29.12.2005	12°26'58.72" N,	77°41'44.98 "E
26	P. Thimmarayan, S/o Bethappa Chetty, 10 1 cross Co-operative colony, Krishnagiri.	Veppalampatti (v) Pochampalli Tk	559/ 2	0.40.5	Colour Granite	G.O.3D No 25 Ind Dept. Dt.23.1.96	23.2.96 to 22.2.2006	12°22'30"N,	78°20'00"E
27	Tvl. Pluto D Granite, No. 15-C Nethaji Bye pass Road, Dharmapuri.	Pachappanatti (v) Denkanikottai Tk	347 (p)	1.96.0	Colour Granite	G.O.3D No 120 Ind Dept. Dt.5.5.95	27.7.95 to 26.7.2005	12°33'39.64" N,	77°52'7.72" E
28	Tvl. Pluto D Granite, No. 15-C Nethaji Bye pass Road, Dharmapuri.	Baleguli (v) Pochampalli Tk.	411/ 1	1.82.0	Colour Granite	G.O.3D No 121 Ind Dept. Dt.5.5.95	3.8.95 to 2.8.2005		
	Details of quarry leases in patta land operated on the basis of the Court order								
01	Tvl. Gem Granite No. 78 Cathedral Raod, Chennai-86	Madakkal Denkanikottai Tk	669/ 1A etc	11.19.5	Colour Granite	Go 3D No. 37 Ind. Dept Dt. 2.3.95 13.3.95 to 12.3.2005.	High Court, order dt 8.3.2005 WPMP No. 8389 in W.P No. 7683/05	12°26'30.48" N,	77°38'52.80 "E
02	Tvl. Magam Inc, B-254, 50 th street, Ashok Nagar, Chennai 600 083	Thimjepalli Denkanikottai Tk	90/2 A	1.60 acres	Colour Granite	GO 3D No. 134 Ind. Dept (E2) Dept. dt. 4.11.93. 26.11.93 to 25.11.2003.	High Court, order dt. 1.12.2003 WPMP No. 42358/03 in W.P No. 34852	12°32'31.43" N,	77°57'32.62 "E
03	Tvl. Karunai Granites (p) Ltd, No. 2/145 Shanthi House, Byepass Road, Krishnagiri	Jagadevipalayam Krishnagiri Taluk	299/ 2 (p) 301/ 1(p)	3.15.5	Colour Granite	GO 2D No. 09 Ind. Dept Dept. dt. 18.2.95. 03.02.95 to 2.02.2005	High Court, order dt. 16.02.2010 WPMP No. 1/10 in W.P No. 3034/2010	12°24'40"N,	77°37'20"E

04	Tvl. Karunai Granites (p) Ltd, No. 2/145 Shanthi House, Byepass Road, Krishnagiri	Jagadevipalayam Krishnagiri Taluk	294/ 4 etc	7.55.0	Colour Granite	GO 2D No. 87 Ind. (E2) Dept Dept. dt. 02.11.99. 03.02.2000 to 02.02.2010.	High Court, order dt. 16.02.2010 WPMP No. 1/10 in W.P No. 3035/2010	12°24'40"N,	77°37'20"E

b) Black Granite :

Sl. No	Name of the lessee	Taluk / Village	S.F.No.	Extent	Name of the Mineral	File No. and Date	Lease Period	Co-ordinates	
								Latitude	Longitude
1	Tvl. Sunshine Enterprises, 41, Karuppa Gounder St, Coimbatore	Varatanapalli, Krishnagiri Tk	71/2B, 73	0.22.5 0.92.0 ---------- 1.14.5	Black Granite	G.O.3D No. 29 Ind.(E2) Dept. Dt. 25.8.2003	10.11.2003 to 09.11.2023	12°20'00"N,	78°30'20"E
2	Thiru.A.Gopinath, S/o Arasappachetti, Medumuthukottai, Balathotanapalli (po), Denkanikottai Taluk	Denkanikottai Tk, Karandapalli	132/1A 132/1B 132/1C 132/1D	0.06.0 0.21.0 0.40.0 0.09.0 ------- 0.76.0 -------	Black Granite	GO (3D) No. 41 Ind. (MMB3) Dt. 18.3.2004	11.5.2004 to 10.5.2024	12°29'16.01"N	77°42'45.96"E
3	Thiru.A.Gopinath, S/o Arasappachetti, Medumuthukottai, Balathotanapalli (po), Denkanikottai Taluk	Denkanikottai Tk, Karandapalli	408/2B 410/1A 420/1A 420/1B1 421/2B	0.20.5 0.66.5 0.16.5 0.25.5 0.39.5 ------- 1.68.5 -------	Black Granite	GO (3D) No. 44 Ind. (MMB3) Dt. 26.3.2004	14.6.2004 to 13.6.2024	12°28'23.75"N,	77°42'5.24"E
4	Tvl. S.B.S. Granites, 1/319, Salem Main Road, Opp. To Govt. High School, Royakottai.	Denkanikottai Tk, Karandapalli	368/3 (p) 368/4B (part)	0.64.5 0.47.5 ------ 1.12.0	Black Granite	GO 3D No. 91 Ind. (MMB3) Dept dated 19.9.2005	09.11.2005 to 08.11.2025	12°29'1.50"N,	77°41'59.03" E
5	G.Vinoth, S/o R. Gopalraj, 26, Akila Nagar, Thiruvanaikoil, Trichy.	Ullatti Hosur TK	257/4A 257/4B 257/5(p) 257/6A 257/6B(p) 257/6C(p) 257/7(p) 257/8(p)	0.14.0 0.18.5 0.10.0 0.08.0 0.12.5 0.18.5 0.22.0 0.24.5 ------- 1.28.0 -------	Black Granite	GO 3D No. 02 Ind. (MMB-3) Dept dated 12.1.06	13.2.2006 to 12.2.2026	12°35'37.63" N,	78° 0'2.63" E
6	Thiru E.C.Senniappan Annamar Granites No. 413/296 Sathy Road, Erode 638 003.	Denkanikottai Tk, Kodiyalam	49 50/3B	2.39.0 0.20.0 ------- 2.59.0	Black Granite	GO 3D No. 32 Ind. (MMB2) Dept dated 23.2.2006	27.3.2006 to 26.3.2026	12°36'20"N,	78° 44'18"E

7	Thiru R.K. Ramesh, 11/12 SBI Colony Ist street, Virugampakkam, Chennai -92.	Denkanikottai Tk, Odaiyandahalli	144/4 146/2	0.41.5 1.82.0 ------- 2.23.5	Black Granite	GO 3D No. 33 Ind. (MMB3) Dept dated 27.2.2006	27.3.2006 to 26.3.2026	12°28'16.33" N,	78°01'21.92" E
8	Tvl. Bannariamman Sugar Ltd, 1212 Trichy Road, Coimbatore 641 018	Puligunda Krishnagiri Tk	532/1A1 528/1A 527/1	0.75.0 0.40.5 2.28.0 -------- 3.43.5	Black Granite	GO (3D) No. 78 Ind. (MME-II) Dept. dated 6.11.2006.	11.12.2006 to 10.12.2026	12°26'11"N,	78° 22'09"E
9	Tvl. Bannariamman Sugar Ltd, 1212 Trichy Road, Coimbatore 641 018	Puligunda Krishnagiri Tk	530/1 530/2	1.65.0 0.26.0 -------- 1.91.0	Black Granite	GO (3D) No. 63 Ind. (MME-II) Dept. dated 23.10.2006.	11.12.2006 to 10.12.2026	12°26'11"N,	78° 22'09"E
10	Tvl. Bannariamman Sugar Ltd, 1212 Trichy Road, Coimbatore 641 018	Puligunda Krishnagiri Tk	745 780 786/1	1.45.5 1.95.0 1.40.0 -------- 4.80.5	Black Granite	GO (3D) No. 62 Ind. (MME-II) Dept. dated 23.01.2006.	11.12.2006 to 10.12.2026	12°26'11"N,	78° 22'09"E
11	Tvl. K.S. Granites 4/59, Bharathi St, Swarnapuri, Salem -4.	Karandapalli Denkanikottai Tk,	378/5	1.14.0	Black Granite	GO 3D No. 95 Ind. (MME2) Dept dated 4.12.2006	05.1.2007 to 04.1.2027	12°29'0.04"N,	77°42'3.59"E
12	Tvl. Ramachandra Granite & Construction Pvt Ltd, Varaganapalli, Nagamangalam Post, Kelamangalam (via), Denkanikottai Taluk	Sandanapalli Denkanikottai Tk,	1765/2 (p) 1765/4 (p)	0.35.5 0.88.0 ---------- 1.23.5 ---------	Black Granite	GO 3(D) No. 17 Ind. (MMEII) Dept. Dt. 5.2.2007	26.2.2007 to 25.2.2027	12°27'57.01" N	77°47'55.25" E
13	Thiru Y. Mohamed Yaseen, 4/59, Bharathi Street, Swarnapuri, Salem 636 004.	Udayandahalli Denkanikottai Tk,	152/1	2.31.0	Black Granite	GO (3D) No. 14 Ind. (MME II) Dept. Dt. 29.1.2007	26.2.2007 to 25.2.2027	12°28'16.31" N,	78°1'27.53" E
14	Thiru. M.Chinnu, Barigam Village, Easalpatti (post), Nallampalli Via, Dharmapuri Dist.	Kalukondapalli Denkanikottai Tk,	312/1A 312/1C1 312/1D1A 312/1D2 387/1	0.19.0 0.08.0 0.17.0 0.08.0 0.68.0 ---------- 1.20.0	Black Granite	GO (3D) No. 15 Ind. (MME II) Dept. Dt. 29.1.2007	24.4.2007 to 23.4.2027	12°37'44"N,	77°45'58"E
15	Tvl. Imperial Granites, 76, Cathedral Raod, Chennai-86.	Puligunda Krishnagiri	540/1	2.77.5	Black Granite	GO (3D) No. 42 Ind. (MME-II) Dept. Dt. 13.3.2007	24.4.2007 to 23.4.2027	12°28'10"N,	78°23'00"E

16	Tvl. Gem Granite No. 78 Cathedral Raod, Chennai-86	Agalakottai Denkanikottai	341/1A 341/1B 341/1C 341/1D 341/1E 341/2A 341/2B 341/2C 341/2D 341/2E 342/2E Total	1.20.5 0.13.5 0.11.5 0.31.5 0.21.5 0.25.0 0.35.5 0.20.0 0.31.0 0.11.5 0.72.0 --------- 3.93.5	Black Granite	GO (3D) No. 59 Ind. (MME-II) Dept. Dt. 16.4.2007	14.5.2007 to 13.5.2027	12°27'59.68" N,	77°39'39.82" E
17	Tmt. Gajalatha, New No. 75, Old No. 36, 1st Avenue, Indira Nagar, Adayar, Chennai 600 020.	Puligunda, Krishnagiri Taluk	799/2A 799/ 3801/1	0.22.5 0.80.0 0.77.5 --------- 1.80.0	Black Granite	GO (3D) No. 83 Ind. (MME-II) Dept. Dt. 21.11.2007	02.1.2008 to 01.1.2028	12°21'40"N,	78°26'45"E
18	Thiru Arun Raja S/o Periyasamy 53/12 Bharathiyar Puram, Melur, Madurai District 625 106	Agaram Krishnagiri Taluk	431/3 431/4D10 431/4D5 431/4D6 431/4D8 431/4D9 431/4F	0.42.5 0.09.0 0.10.0 0.05.5 0.05.5 0.13.0 0.15.5 ------- 1.01.0	Black Granite	GO (3D) No. 3 Ind. (MME-2) Dept. Dt. 25.1.2008	28.2.2008 to 27.2.2028	12°27'33"N,	77°08'24"E
19	Thiru K.M. Nagaraja, Menasiganahalli, Venkanahalli (po),Anekal Taluk,Bangalore.	Ulimaranapalli Denkanikottai Taluk	206/2A 208/1B	0.57.5 0.42.5 --------- 1.00.0	Black Granite	GO (3D) No. 48 Ind. (MME-2) Dept. Dt. 14.7.2008	30.7.2008 to 29.7.2028	12°39'4.22"N,	77°40'56.33" E
20	Tvl. Bannariamman Sugar Ltd, 1212 Trichy Road, Coimbatore 641 018	Puligunda Krishnagiri Tk	528/1B(p), dtc	1.01.0	Black Granite	GO (3D) No. 44 Ind. (MME-2) Dept. Dt. 27.6.2008	25.7.2008 to 24.7.2028	12°26'11"N	78°22'09"E
21	Tvl. Bannariamman Sugar Ltd, 1212 Trichy Road, Coimbatore	Puligunda Krishnagiri Tk	781 (p) 744 (p)	3.68.5	Black Granite	GO (3D) No. 43 Ind. (MME-2) Dept. Dt. 27.6.2008	25.7.2008 to 24.7.2028	12°26'11"N	78°22'09"E
22	Thiru K.V. Bharath Raju, 43/3 K.R. Garden, Puttainahalli, J.P. Nagar, 7th Phase, Bangalore	Karandapalli Denkanikottai Tk,	431/3 432/1A 432/1B 4321/4A 432/4B 441/3	0.33.5 0.40.5 0.34.5 0.08.0 0.05.0 0.15.5 ------- 1.37.0	Black Granite	GO (3D) No. 58 Ind. (MME-2) Dept. Dt. 16.9.2008	20.10.2008 to 19.10.2028	12°28'9.78"N	77°42'23.33" E
23	Thiru Y. Mohamed Yaseen, S/o Yusuff Basha, 4/59, Bharathi Street, Swarnapuri, Salem 636 004.	Guttur Krishnagiri	879(p), 880/1A, 882/1, 890 (p) 892(p)	0.43.0 0.18.0 0.47.5 0.72.5 0.72.5 -------- 2.53.5	Black Granite	GO (3D) No. 62 Ind. (MME-2) Dept. Dt. 29.9.2008	10.11.2008 to 9.11.2028	12°26'20"N,	78°24'30"E

24	Thiru.Chinnasamy, S/o Tavasaiah, Krebeedi, Kurupete, Kanakapura Town, Ramanagara District. Karnataka State.	Palayamkottai Denkanikottai Taluk	397/1	1.18.0	Black Granite	GO (3D) No. 63 Ind. (MME-2) Dept. Dt. 29.9.2008	10.11.2008 to 9.11.2028	12°28'25.47" N	77°40'48.59" E
25	Tvl.Subiksha Granites, (por.) M. Ananthi, No. 3/593 Rayappa Nagar, Krishnagiri 635 001.	Malligarjuna durgam, Denkanikottai Taluk	36/1A 35/1B	2.07.5	Black Granite	GO (3D) No. 78 Ind. (MME-2) Dept. Dt. 30.10.2008	28.11.2008 to 27.11.2028	12°27'39.10" N,	77°43'48.28" E
26	Thiru T.S. Gowrishangar, S/o Subramji, D.No.20, 4th St, Sudharaban,. Nagar,Anbiga Nagar Extenstion, Madambakam, Chennai 73	Marachandira m Krishnagiri Taluk	215/1	1.06.0	Black Granite	GO (3D) No. 76 Ind. (MME-2) Dept. Dt. 29.10.2008	15.12.2008 to 14.12.2028	12°38'40"N	78°08'30"E
27	Tmt.Omanakuma ri Door No. 4-22 B Sivankoil Road, Thrunanthikarai, Kulasekhram 626 161	Irudhukottai Denkanikottai Taluk	942/1, 977/3B, 978/3, 978/4A	0.31.0 0.93.0 1.03.0 0.59.0 -------- 2.86.0	Black Granite	GO (3D) No. 22 Ind. (MME-2) Dept. Dt. 22.4.2010	31.5.2010 to 30.5.2030	12°26'46.13" N	77°47'37.10" E
28	V.Dhanaraj, 44/A Kanagasabai st, Nagalapuram Tindivanam 604 002	Kuppatti Village Thogarai Agraharam Kakkadasam Village	460/3 40/1B, 1/1A	0.40.5 0.40.5 0.40.5 -------- 1.21.5	Black Granite	GO (3D) No.23 Ind. (MME-2) Dept. Dt. 24.4.2010	11.6.2010 to 10.6.2030	12°36'34.15" N	77°43'19.67" E
29	R.K.Ramesh, 11/12 State Bank Colony 1st Street, Virugampakkam, Chennai 600 092	Odayandahall i Village, Denkanikottai Taluk	144/1, 144/2	1.72.0 0.72.0 ------- 2.44.0	Black Granite	GO (3D) No.27 Ind. (MME-2) Dept. Dt. 2.6.2010	28.6.2010 to 27.6.2030	12°28'16.23" N,	78° 1'23.45"E
30	R.Vishal Shahal S/o Omati Chahal, D-1 Svadh green Mandaown 4rh cross Rushan Bagh, Bangalore, Karnataka State.	Irudhukottai Denkanikottai Taluk	816/1 817/2 817/3 817/4 817/5 817/7 819/20 819/24A	0.28.5 0.28.5 0.08.0 0.04.0 0.07.5 0.10.0 0.11.0 0.11.0 ------- 1.08.5	Black Granite	GO (3D) No.28 Ind. (MME-2) Dept. Dt. 28.6.2010	05.7.2010 to 04.7.2030	12°27'59.67" N,	77°47'52.60" E
31	M/s. Suganya Granites, 1-1-11, Vel Murugan Colony, Palaympatti Village, Aruppukottai Talkuk Virudunagar Dist.	Karandapalli Village, Denkanikottai Taluk	414/3 (p), 441/8, 441/6B(p)	0.72.0 0.41.5 0.37.5 -------- 1.51.0	Black Granite	GO (3D) No. 28 Ind.(MME2) Dept dt. 28.6.2010	31.8.2010 to 30.8.2030	12°28'6.22"N,	77°42'15.11" E

32	Tvl. R&R Granite Imports and Exports,. Plot No. 64 3,3rd Cross, Bommasandra Industrial Area, Hosur Road, Bangalore 560 099	Karandapalli Denkanikottai Tk,	111/2B, 111/4A2 111/5C2	0.09.5 0.26.0 0.68.0 -------- 1.03.5	Black Granite	GO (3D) No. 16 Ind/ (MME-2) Dedt 14.2.2011	1.3.2011 to 28.2.2031	12°28'9.09"N,	77°42'54.45" E
33	Tmt. S.Radha, W/o V. Rajmohan, No. 4 Sipcot Housing Colony, Dharga, Hosur, Krishnagiri District.	Immidinayakanapalli Village Hosur Taluk	132/5B (part) 134/2	1.04.5	Black Granite	G.O (3D) No. 40 Ind. (MME-2) Dept. dated 01.03.2011	29.8.2011 to 28.8.2031.	12°35'20"N,	78°04'10"E
34	Tmt. E. Edhayeswari, W/o R. Elango, 138 KG street, Coimbatore 640 001.	Karandapalli Village, Denkanikottai Taluk	146/3A 147/1A 147/2A	0.20.5 0.91.0 0.30.5 -------- 1.42.0	Black Granite	G.O (3D) No. 39 Ind.s (MME-2) Dept dated 01.03.2011.	29.8.2011 to 28.8.2031.	12°29'11.85" N,	77°43'51.23" E
35	B.M. Continental Granites and Mienrals Ltd, SIGE Mansion 1st Floor, 62 Annasalai,Chennai 600 006	Puligundai Village, Krishnagiri Taluk	582/2 579/1A 579/2B 579/3B 579/4B 579/5B 599/1 599/2 599/3 599/4 599/5 599/6 599/7 599/8	1.21.5 0.18.5 0.19.0 0.10.0 0.14.0 0.38.5 0.59.0 0.37.5 0.32.0 0.44.5 0.19.0 0.08.0 0.05.0 0.10.0 -------- 4.37.0	Black Granite	GO (3D) No.56 Ind. (MME-2) Dept. Dt. 23.11.2011	14.12.2011 to 13.12.2031	12°27'05"N,	78°22'50"E
36	M/s Jailakshmi Venkatesh Granite Pvt, Ltd, No. 37, Armenian Street, Kolkatta 700 001	Guttur Village Krishnagiri Taluk	869 (Part)	1.00.0	Black Granite	G.O (3D) No. 12 Ind. (MME-2) Dept. dated 25 .05.2012 .	25.6.2012 to 24.6.2032	12°26'20"N,	78°24'30"E
37	Tvl. TAB India Granites Private Ltd, NH 47 Nallaganakothapally Village, Krishnagiri Road, Koneripalli Post, Hosur Taluk, Krishnagiri District -635 117	Anumanthapuram Village Denkanikottai	270/2B 270/4	0.52.0 0.76.0 ------- 1.28.0	Black Granite	G.O (3D) No. 2 Ind. (MME-2) Dept. dated 05 .04.2013 .	15.5.2013 to 14.5.2033	12°27'34.76" N,	77°50'33.49" E

38	Tvl. TAB India Granites Private Ltd, NH 47 Nallaganakothapally Village, Krishnagiri Road, Koneripalli Post, Hosur Taluk, Krishnagiri -dt	Anumantha puram Village Denkanikottai	26/2	1.21.0	Black Granite	G.O (3D) No. 3 Ind. (MME-2) Dept. dated 05 .04.2013 .	15.5.2013 to 14.5.2033	12°27'34.10" N,	77°50'37.47" E
39	Tvl. Variety Trade Links, No.962,24th Main 4th "T" Block, 39th cross, Jaya Nagar, Bangalore	Semparasana palli Denkanikottai	288/3B 329/1 329/2A2 329/2B 330/1 335/1A	0.20.0 0.04.0 0.40.0 1.52.5 0.20.0 0.40.5 -------- 2.77.0	Black Granite	G.O (3D) No. 5 Ind. (MME2) Dept. Dt. 13.5.2013	01.7.2013 to 30.6.2033	12°43'00"N	78°02'00"E
40	TVl. N.M Granites Private Limited, No. 80, 1st Cross, 5th Main LIC Colony, Jayanagar, Bangalore 560 011.	Agalakottai Denkanikottai	512/2	1.21.5	Black Granite	G.O (3D) No. 19 Ind. (MME2) Dept. Dt. 14.07.2014	21.8.2014 to 20.8.2034	12°28'30.01" N	77°40'38.11" E
41	Thiru A.M. Murugan, S/o Mannathan, Panapuram Village, Mathampatty Post, Mettur Taluk, Salem District.	Kathiripalli Krishnagiri	61/1 312/2C 312/2D 312/3C 312/3D, 312/4	0.96.5 0.23.5 0.28.5 0.16.5 0.05.0 0.24.0 ---------- 1.94.0	Black Granite	G.O (3D) No. 08 Ind. (MME2) Dept. Dt. 03.03.2014	12.9.2014 to 11.9.2034	12°41'30.3"N	78°09'52.4"E
42	Thiru H.A. Iqbal Hussain, S/o Abdul Basheer, No. 80 1st Cross, 5th Main, LIC Colony, 3rd Block, Jayanagar, Bangalore, Karnataka State 560 036	Agalakottai Denkanikottai	511/1	1.07.5	Black Granite	G.O (3D) No. 34 Ind (MME-2) Dept. dated 17.11.2015	23.12.2015 to 22.12.2035	12°28'27.04" N	77°40'27.90" E
43	Thiru H.A. Sardar Ahmmed, No. 80 1st Cross, 5th Main, LIC Colony, 3rd Block, Jayanagar, Bangalore,-36	Agalakottai Denkanikottai	322/1 (part)	1.21.5	Black Granite	G.O (3D) No. 34 Ind (MME-2) Dept. dated 17.11.2015	23.12.2015 to 22.12.2035	12°28'28.78" N	77°40'30.75" E
44	Tvl. Tab India Granite Private Limited, NH 7, Nallaganakothapalli Village, Krishnagiri Road, Koneripalli Post, Hosur Taluk, Krishnagiri District 635 117.	Immidinaya kanapalli Hosur	143/2 (p)	1.86.0	Black Granite	G.O (3D) No. 47 Ind (MME-2) Dept dt 10.12.2015.	08.01.2016 to 07.01.2036.	12°36'11"N to 12°36'17"N	78°04'45"E to 78°04'50"E

45	Tvl. U.V.R Granites Exports H-93 TNHB Phase, Opp. Railway Station, opp Railway Station, Hosur Krishnagiri Dist.	Kathiripalli Krishnagiri	190/1B (p) 190/1C2 (p) 191/(p)	0.10.0 0.29.0 0.63.5 ------- 1.02.5	Black Granite	G.O (3D) No. 02 Ind (MME-2) Dept dt 07.01.2016.	01.03.2016 to 29.02.2036.	12°41'30.99253"N,	77°08'51.41244" E
46	Tvl. Kadampa Granite D 37 20 th C Cross, E.G Puram, Viveka Nagar (p) Bangalore	Anumantha puram Village Denkanikottai	26/6 27/1A	0.98.0 0.22.5 -------- 1.20.5	Black Granite	G.O (3D) No. 15 Ind (MME-2) Dept dt 01.02.2016	29.02.2016 to 28.02.2036.	12°27'32.52" N,	77°50'42.02" E
47	Thiru Narra Rupesh Kumar, S/o Narra Eswara Reddy, Door No. 170,2nd Cross 1st Block Koramangala Bangalore 560 034	Sokkadi Krishnagiri Taluk	445/1A 445/2B 445/2C 445/2A 75/2A (p) 75/2B2	0.14.0 0.21.5 0.02.0 0.08.5 0.30.5 0.40.5 -------- 1.17.0	Black Granite	G.O (3D) No. 46 Ind (MME-2) Dept dt 10.12.2016	08.02.2016 to 07.02.2036.	12°28'27.15" N,	78°08'37.03" E
48	Laksha Granites & Exports Pvt, Ltd,No. 10 G 2nd Cross, Co-operative Colony, Krishnagir 635 0001	Marasandiram Krishnagiri Taluk	248/1A (p) 248/1B (p) 248/1C (p) 248/2 (p)	0.58.0 0.72.0 0.56.0 1.07.0 -------- 2.93.0	Black Granite	G.O (3D) No. 53 Ind. (MME.2) Dept. Dt. 28.07.2016.	23.08.2016 to 22.08.2036	12°37'.51"N to 12°37'.57"N	78°09'58"E to 78°10'06"E
49	M/s. M.C.B Granites and Exports P. Ltd, No. 315 Mahalakshmi Towers,Opposite to Tamil Nadu Electricity Board, Royakottai Road, Hosur Town Krishnagiri -Dt.	Naduvanapalli Krishnagiri Taluk	79 80 258/6A 258/2B 258/6B	1.19.5 0.92.5 0.28.5 0.28.5 0.12.0 -------- 2.81.0	Black Granite	G.O (3D) No. 54 Ind. (MME-2) Dept. Dt. 28.07.2016.	24.08.2016 to 23.08.2036	12°41'.40"N to 12°41'.48"N	78°10'23"E to 78°10'31"E
50	M/s. Seven Hills Bi, 2/36, I st Floor, S.R.Traders Upstairs, Krishnagiri Bye Pass Road, Hosur Krihsnagiri Dist.	Irudhukottai Denkanikottai Taluk	802/3B1 803/1 803/2 804/2 804/3 805/1 805/2 831/2 (p)	0.43.5 0.27.5 0.09.5 0.24.0 0.21.0 0.32.5 0.21.0 0.11.0 ------- 1.90.0	Black Granite	G.O (3D) No. 65 Ind. (MME-2) Dept. Dt. 31.10.2016.	12.12.2016 to 11.12.2036	12°28'1.10"N,	77°47'36.96" E
51	Thiru V. Jayaprakash, S/o Venkatesh, NO. 310 HIG Phase 10 New Temple Ltd, HUDCO Royakotta Road, Hosur Taluk, Krishnagiri District	Sandanapalli Denkanikottai Taluk	1549/1 1549/3 (p) 1550/3A (p)	0.50.5 0.77.5 0.60.5 ------- 1.88.5	Black Granite	G.O (3D) No. 23 Ind. (MME-2) Dept. Dt. 02.04.2018.	13.06.2018 to 12.06.2038	12°27'38.22" N,	77°49'14.91" E

52	Thiru M. Ramamoorthy S/o Manickam, Valasagondanur Village, Puliyampatti Post, Pochampalli Taluk	Kathiripalli Krishnagiri Taluk	309/1	3.95.5	Black Granite	G.O (3D) No. 43 Ind. (MME-2) Dept. Dt. 27.11.2018.	27.11.2018 to 26.11.2038	12°41'28.90" N,	77°09'57.47" E
53	Thiru E.C.Senniappan, Tvl. Annamar Granite, No 17Pon Street, Erode-2	Devaganapalli Denkanikottai TK	245	2.02.0	Black Granite	G.O.3D No 51 Ind Dept.Dt 30.04.98	05.4.99 to 04.4.2019	12°40'00"N,	77°42'00 "E
54	Thiru E.C.Senniappan, Tvl. Annamar Granite, No 17Pon Street, Erode-3	Devaganapalli Denkanikottai TK	246	1.95.5	Black Granite	G.O.3D No 55 Ind Dept.Dt 08.05.98	05.4.99 to 04.4.2019	12°40'00"N,	77°42'00 "E
55	Thiru E.C.Senniappan, Tvl. Annamar Granite, No 17Pon Street, Erode-4	Anniyalam Denkanikottai TK	786 (Part II)	2.04.5	Black Granite	G.O.3D No 59 Ind Dept.Dt 11.05.98	05.4.99 to 04.4.2019	12°36'00"N,	77°39'06"E
56	Thiru E.C.Senniappan. Tvl. Annamar Granite, No,17 Ponn Street, Erode-1	Anniyalam Denkanikottai TK	786 (Part I)	3.76.5	Black Granite	G.O.3D No 100 Ind Dept.Dt 10.7.98	05.4.99 to 04.4.2019	12°36'00"N,	77°39'06"E
57	M/s. God Granites, S.F NO. 135 &137 Beemandapalli Village, Krishnagiri Taluk	Karandapalli Denkanikottai TK	416/2	0.68.0	Black Granite	G.O.3D No 103 Ind Dept.Dt 27.7.98	05.4.99 to 04.4.2019	12°28'28.44" N,	77°42'13.00" E
58	M/s. God Granites, S.F NO. 135 &137 Beemandapalli Village, Krishnagiri Taluk	Karandappalli Denkanikottai TK	428/4	1.52.0	Black Granite	G.O.3D No 104 Ind Dept.Dt 27.7.98	05.4.99 to 04.4.2019	12°28'28.62" N,	77°42'17.39" E
59	TamilNadu Minerals Ltd Chennai	Karandapalli Denkanikottai Tk	538/1 538/4 539/1	0.38.0 1.21.5 2.31.0 -------- 3.90.5 --------	Black Granite	GO.Ms. No. 13 Ind.(MME1) Dated 26.3.2004.	22.6.2004 to 21.6.2034	12°29'12.74" N,	77°43'28.39" E
60	TamilNadu Minerals Ltd Chennai	Akalakottai Denkanikottai Tk	514	4.02.0	Black Granite	GO.Ms. No. 14 Ind.(MME1) Dated 26.3.2004.	22.6.2004 to 21.6.2034	12°28'25.87" N	77°40'35.84" E
61	TamilNadu Minerals Ltd Chennai	Hanumanthapuram Denkanikottai Tk.	14/1 270/3	2.81.0 1.05.0 -------- 3.86.0 ------	Black Granite	GO.Ms. No. 119 Ind.(MME1) Dated 27.9.2005.	07.12.2005 to 06.12.2035	12°27'31.33" N,	77°50'45.83" E

62	TamilNadu Minerals Ltd Chennai	Karandapalli Denkanikottai Tk	533/2	1.32.5	Black Granite	GO.(3D) No. 17 Industries (MME-1) Department Dated 14.02.2011	28.02.2011 to 27.02.2041	12°28'22.65" N,	77°43'28.60" E
63	Tamil Nadu Minerals Ltd Chennai	Puligunda Krishnagiri Tk.	775	2.51.0	Black Granite	G.o. (3D) No. 64 Ind. (MME-1) Dept. Dt. 05.12.2011	12.3.2012 to 11.3.2042	12°26'26"N,	78°22'34"E
64	Tamil Nadu Minerals Ltd Chennai	Karanadpalli Denkanikottai	155/2	14.53.0	Black Granite	G.o. (3D) No. 58 Ind. (MME-1) Dept. Dt. 29.11.2011	09.4.2012 to 08.4.2042	12°28'20.81" N,	77°43'40.84" E
65	Tamil Nadu Minerals Ltd Chennai	Devaganapalli Denkanikottai TK	217 (part) 237 (part)	1.20.0 1.30.0 -------- 2.50.0	Black Granite	G.o.(3D) No. 8 Ind. (MME-1) Dept. Dt. 19.4.2012	13.07.2012 to 12.07.2042	12°35'16"N	77°44'44"E

10. Details of Seiniorage fee realized in the last three years.

Sl.No.	Name of the mineral	Seiniorage fee collected (In Rupees)		
		2016-17	2017-18	2018-19
1	Black Granite	11,93,40,239	4,21,44,504	2,35,07,510
2	Colour Granite	22,26,67,990	9,54,41,416	9,30,83,370

11. Details of production of Minerals in last three years.

Sl. No.	Name of the mineral	Quantity produced (in cbm)		
		2016-17	2017-18	2018-19
1	Black Granite	29028.247	12289.146	6246.002
2	Colour Granite	94306.434	48053.061	44154.400

12. Mineral map of the District :

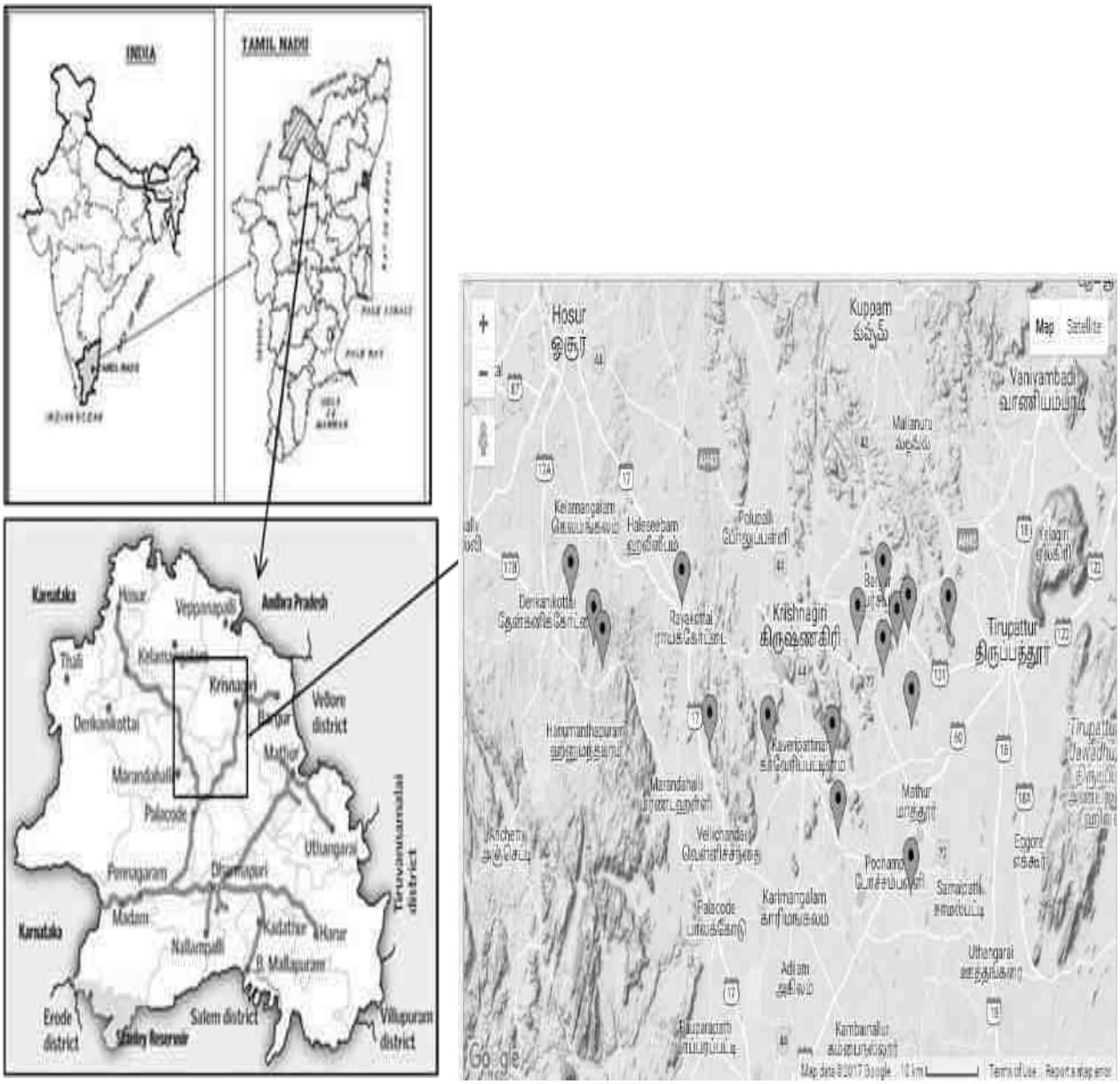


Fig.1 Map showing Location of Granite quarries of Krishnagiri District

13. List of letter of Indent (LOI) holders for Granite quarrying in Krishnagiri District along with its validity.

S. No	Name of the Mineral	Name of the Lease	Details of Precise Area Communication	Extent (In Hect.)	Taluk/ Village	SF.No.	Location of the Mining Lease
1	Black Granite	Thiru Narra Rupesh Kumar, Proprietor M/s.Sukracharya Minerals, 170 2nd Cross, 1st Block, Koramangala, Bangalore 560 034	Govt.lr.No.11876/ MME.2/2018-1 Dt:25.10.2018	1.78.5	Odayandahalli village of Denkanikottai Taluk	181/3, 182/7, 185/4 & 185/5	12°28'14.42"N to 12°28'19.98"N 78°02'09.75"E to 78°02'17.75"E
2	Multi Colour Granite	M/s.Sri Angalamman Granites,No.16/54-A,NedumaranNagar, Dharmapuri District	Govt.lr.No.10246/ MME.2/2018-1 Dt:12.10.2018	2.39.5	Karandapalli Village of Denkanikottai Taluk,	567/1, 567/3 & 567/5	12°28'44.49"N to 12°28'50.47"N 77°43'53.69"E to 77°44'01.74"E
3	Grey Granite	M/s.GoodLuck Exports, SR Tower, No.50/3, Thayapper Street, RCS, Main Road, Nattrampalli, Vellore District,	Govt.lr.No.11875/ MME.2/2018-1 Dt:15.10.2018	1.60.0	Puligunda Village of Bargur Taluk,	170, 171/2B (P), 180/2 (P) & 181/1A (P)	12°24'58.02"N to 12°25'04.04"N 78°21'00.01"E to 78°21'05.98"E
4	Grey Granite	Tmt. Mariambanu W/o Mir Nazim ali, No.1/192, Muslim masuthi street, Jagadevi(Po), Bargur(Tk) Krishnagiri(Dt)	Govt.lr.No.8521/ MME.2/2018-1 Dt:09.08.2018	3.70.0	Kondappanaya napalli Village of Bargur Taluk,	131/11	12°29'36.67"N to 12°29'41.90"N 78°20'17.54"E to 78°20'33.11"E
5	Grey Granite	Thiru.T.Ekamba vanan.No.2/488, Sellandi nagar, Krishnagiri Taluk Krishnagiri District,	Govt.lr.No.22544/ MME.2/2010 Dt:01.02.2011	1.21.0	Ikondamkotha palli Village of Bargur Taluk	116/1(P)	12°26'51.53"N to 12°26'55.88"N 78°18'40.66"E to 78°18'45.78"E
6	Black Granite	Thiru.D.Loganathan S/o. Duraisamy, D.No.3B, 3rd cross, power House colony, Krishnagiri Taluk, Krishnagiri District	Govt.lr.No.9969/ MME.2/2018-1 Dt:06.09.2018	1.26.5	Agasipalli Village of Krishnagiri Taluk	757	12°28'45.13"N to 12°28'48.60"N 78°13'58.49"E to 78°14'07.46"E
7	Grey Colour Granite	Thiru.K.M.Natarajan S/o. K.Murugan, 3/79, Amballi Road, Kandhili Post, Tiruppattur Taluk, Vellore Dt- 635 901	Government Letter No.14484/MME-2/2018-1 dated:04.02.2019	1.15.80	Jagadevipalaya m Village, Bargur Taluk, Krishnagiri Dist	311/9B, 311/11, 311/14A, 311/14B & 311/15B,	12°29'14.33"N to 12°29'19.80"N 78°21'19.41"E to 78°21'23.97"E
8	Colour Granite	M/s. TAMIN Ltd.,	G.O.Ms.No.268,, Industries (MME.1) Dept. dt:13.03.1999	34.35.5	Soolamalai village, Bargur Taluk	283 (P),	12°29'29.94" to 12°29'59.36" 78°17'29.01" to 78°17'60.77"
9	Colour Granite	M/s. TAMIN Ltd.,	G.O.Ms.No.238 Industries (MME.1) Department, dated:17.03.1999	27.04.5	Jakkery village, Denkanikottai Taluk,	486 (Part) 736/4	12°29'29.94" to 12°29'59.36" 78°17'29.01" to 78°17'60.77"

14. Total reserve available in the District:

14.1 : Minor Mineral : GRANITE

Since most part of the district consists of Major out crops of Granite gneiss and charnockite as hillocks and consealed beneath the topsoil, enough resourses of various types / colours of Granite (Grey, Red, & Multi colour) and Black Granite dykes of various dimensions as intrutions into the country rocks.

15. Quality /Grade of Mineral availability in the district:

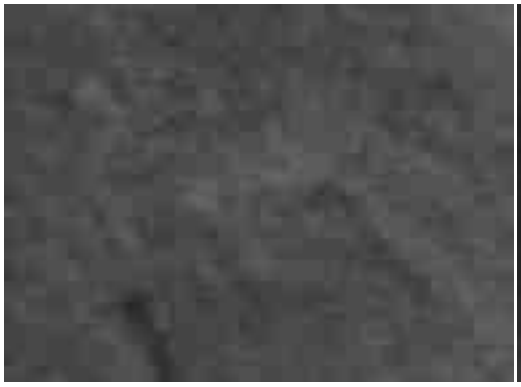
15.1 - Granites:

The Multi coloured Grey Migmatite Granite is an acidic rock with gneissic fabric popularly called as 'Paradiso' available in Krishnagiri and Pochampalli Taluks. The mineral constituents of the rock mass shall be about orthoclase feldspar 40%, Quartz roughly 25%, Plagioclase feldspar 25%, mica 15% and other minerals 5%. The colour of the rock depends upon the colour of the constituent feldspar. It takes very high polish. The multi colored paradise slabs are being exported to America, England, Australia and other European countries in large quantities.

“Bash Paradiso” and “Red Multi Colour” Granite are available in Denkanikottai Taluk.

“Black granite” deposit is available in Krishnagiri, Hosur and Denkanikottai Taluks. Black Granite is a variety of basic rock, geologically known as dolerites. It takes very high polish, displaying uniform grain size and equigranular texture. The rock can be cut into thin slabs.

Granite processing units, which make slabs of granite, finished and decorated beautifully is located mainly in Krishnagiri, Bargur, Shoolagiri and Hosur surroundings.



Paradiso **Black Granite**

16. Use of Mineral :

The Multi coloured granite names as "Paradiso" is the most popular multi colored granite available in Krishnagiri and Pochampalli Taluks. “Pass Paradiso” and “Red Multi Colour” Granite are available in Denkanikottai Taluk. “Black granite” deposit is available in Krishnagiri, Hosur and Denkanikottai Taluks. Granite processing units, which make slabs of granite, finished and decorated beautifully is located mainly in Krishnagiri, Bargur, Shoolagiri and Hosur surroundings. The multi colored paradise slabs are being exported to America, England, Australia and other European countries in large quantities.

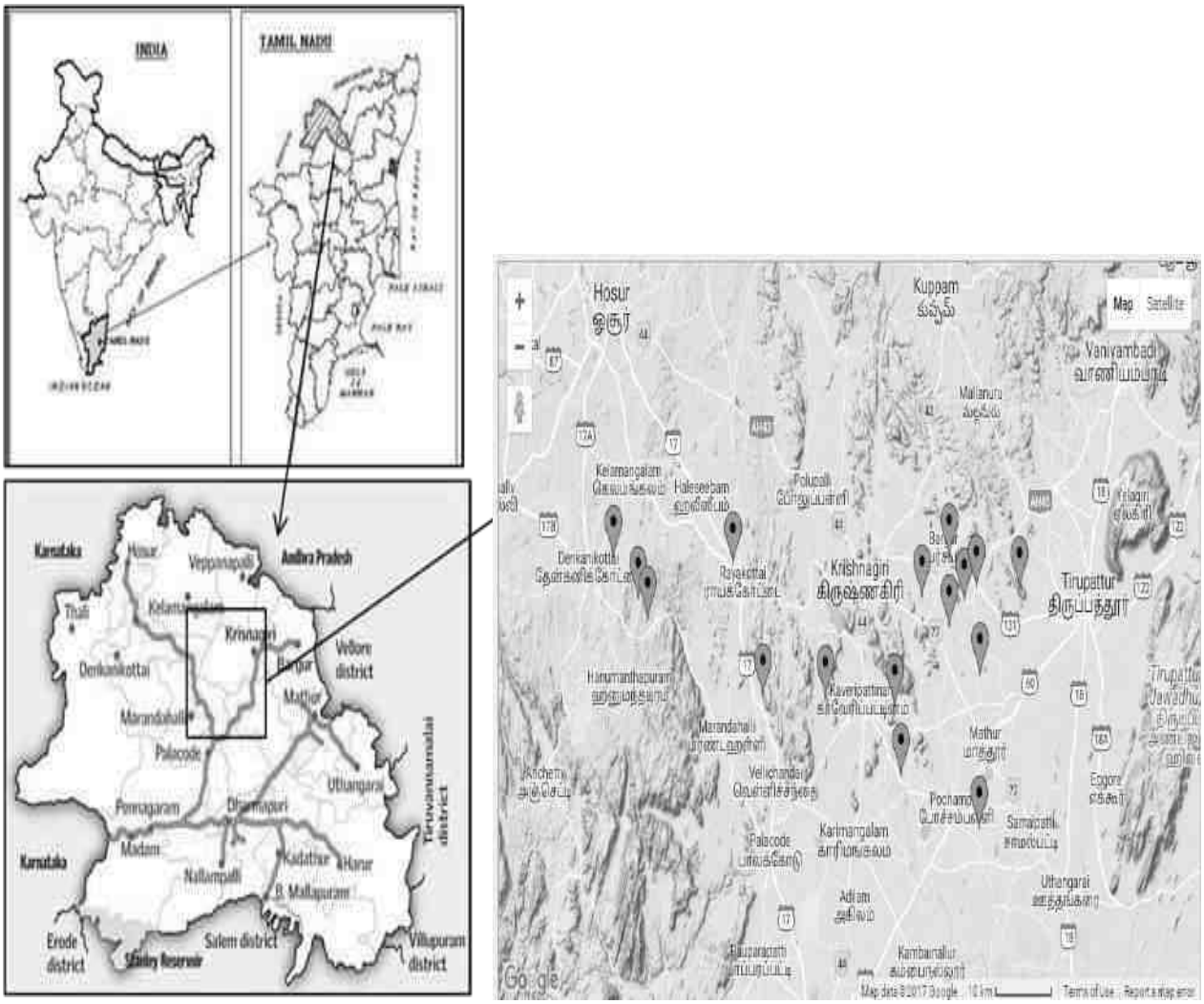
17. Demand and supply of Mineral in the last three years

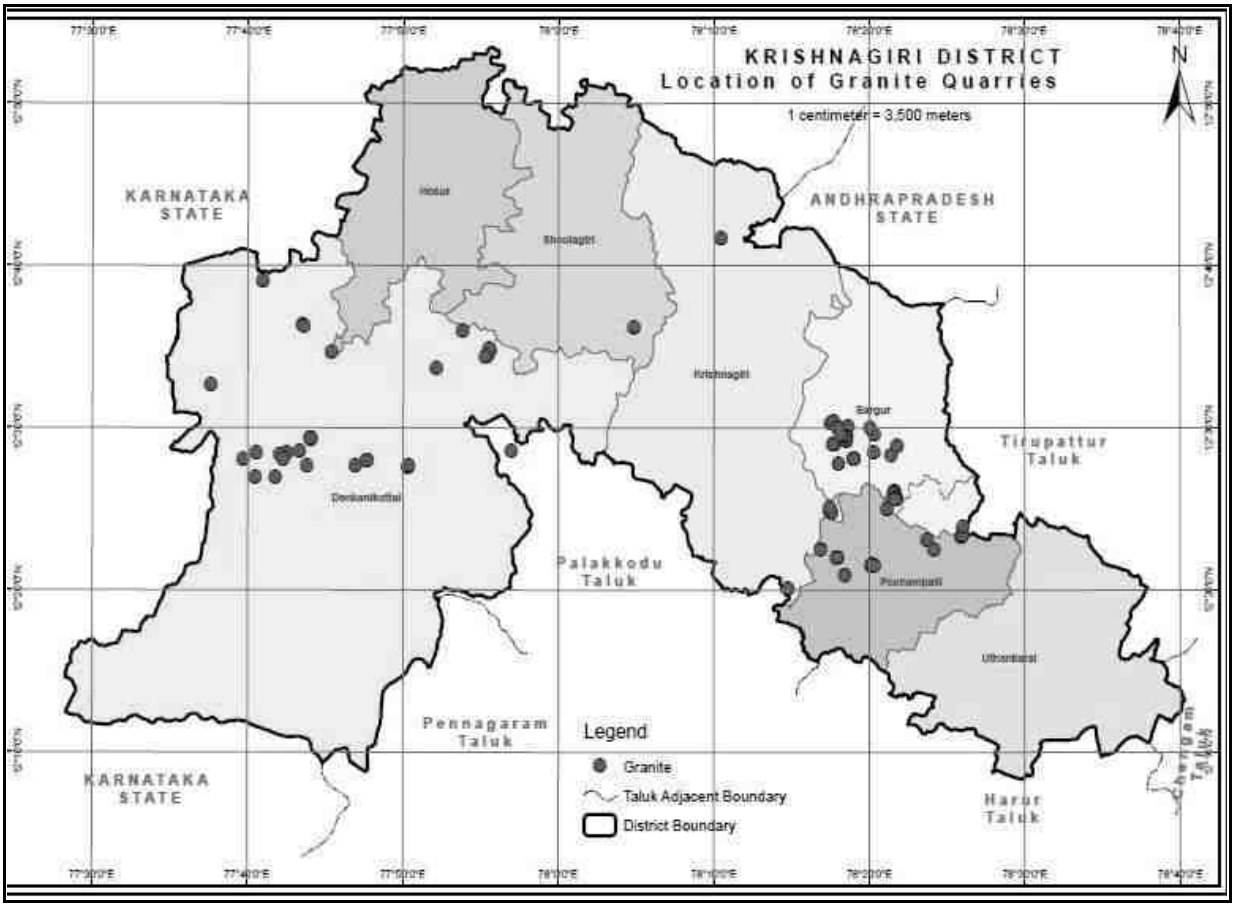
17.1: Supply of Granite Details:

Year	2016-17	2017-18	2018-19
Colour Granite (cbm)	94306.434	48053.061	44154.400
Black Granite (cbm)	29028.247	12289.146	6246.002

18. Mining leases marked on the map of the district

The Map showing the location of Granite quarries in Krishnagiri District :





19. Details of the area of where there is a cluster of mining leases Viz. Number of mining leases, location (Latitude and Longitude):

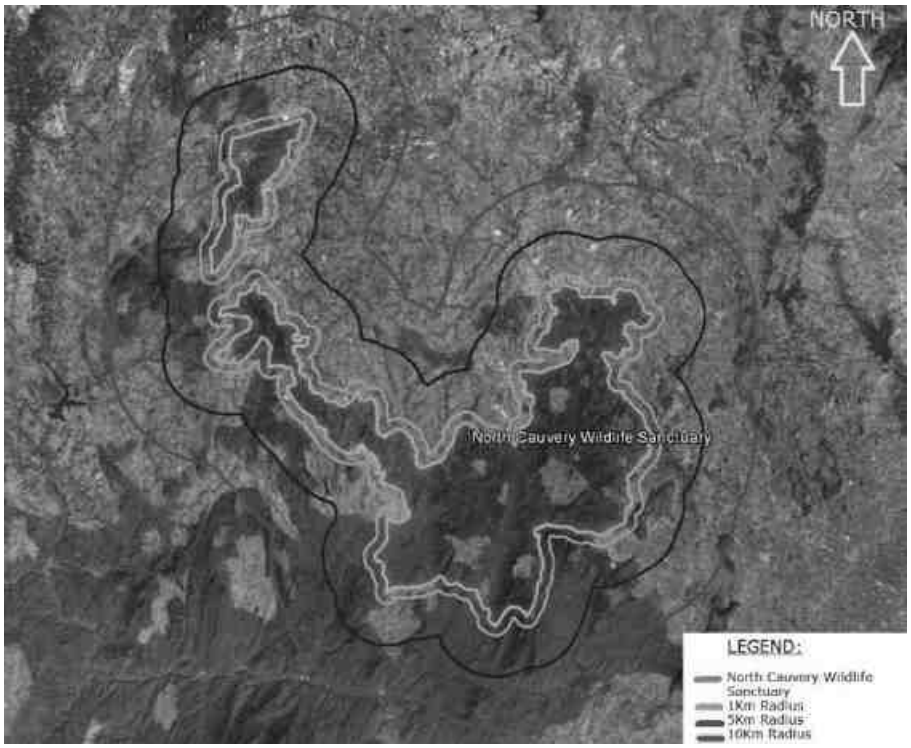
Sl.No.	Name of the Mineral	Letter of Intent Grant order No. & date	Area of mining lease to be allotted (Ha)	Village	Taluk	District	Geological Reserves (cbm)	Use (Capitive /Non-capitive)	Location of the Mining lease (Latitude & Longitude)
		---------- NIL ----------							

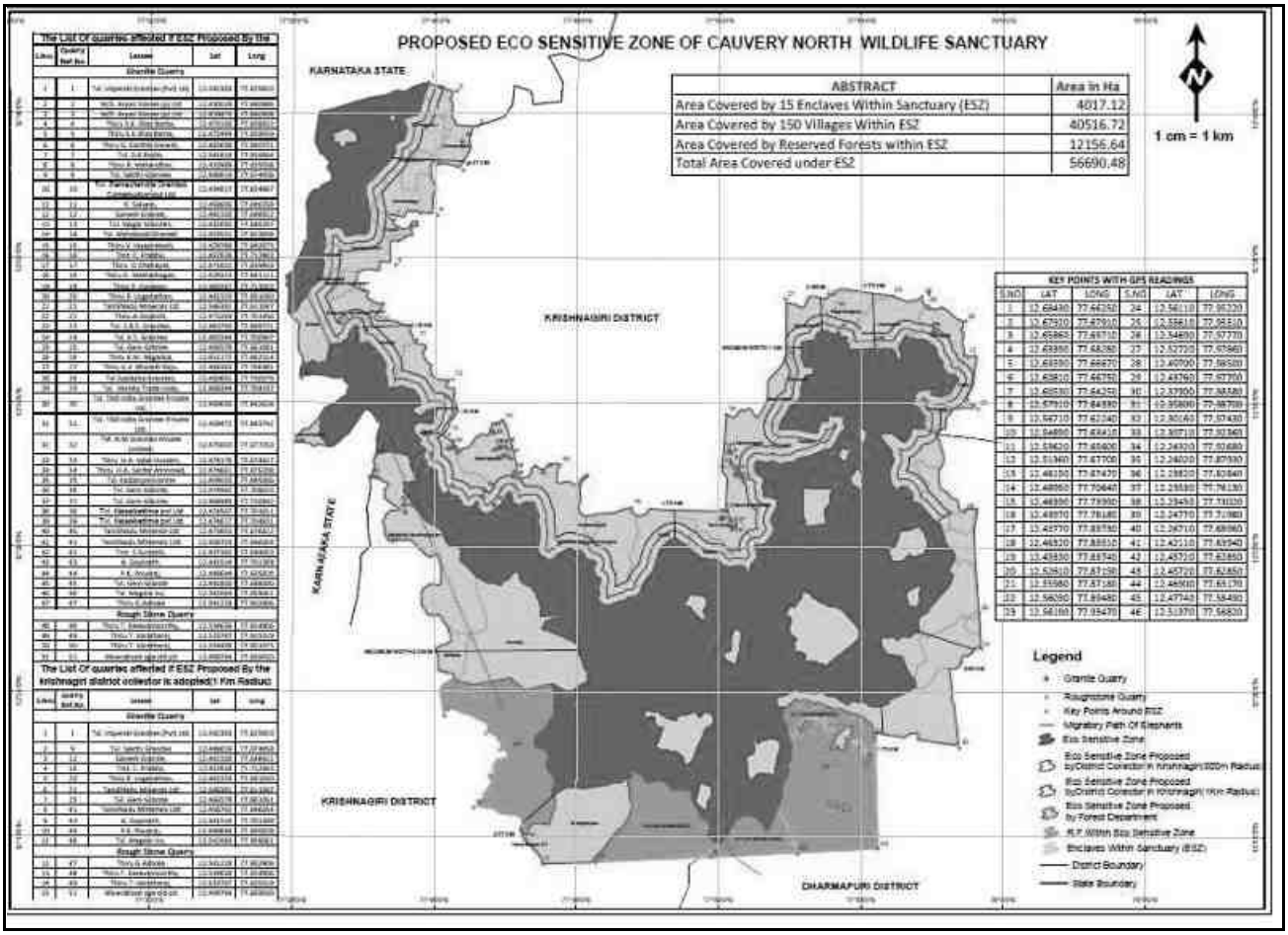
20. Details of Eco-Sensitive area, if any in the district

The Cauvery North Wild Life sanctuary located in Krishnagiri District measuring between 12.23450 N and 12.68430N Latitude and 77.63410E and 77.98700 E Longitude over an extent of 566.90 Sq.km covering 150 villages and reserve forests, has been carved out and from the forest of Hosur Division and published in Govt. of Tamilnadu Gazeet No.10 (Part-2) -section-2 Dt:12.03.2014. based on the direction of the Hon'ble supreme court of India, Ministry of Forest Environment and Climate change Division the Eco Sensetive zone proposal on the Cauvery North Wild Life sanctuary has been prepared in consultation with the District Administartion of Krishnagiri District and the local people and the Eco-sensetive zone proposal has been submitted to the Principal Chief conservator of Forest and Chief Wild life warden for publication under the colum 'Activity proposed to be permitted, regulated and probhited within the Eco sensetive zone', No Mining activity has been proposed within 500mts from the boundary of the wild life sanctuary.

Government of India, Ministry of Enviroment Forest office Memorandum No.L-11011/ 47/2011-1A-11 (M) Dt:18.05.2012. and as per the guidelines issued in office memorandum F.No.J-11013/41/2006-1A-II (I) (Part) Dt:20.08.2014 by the ministry of Forest and Environment climate change, Govt. of India, New Delhi, if the site of quarrying is located within **10kms** from the boundry of protected areas such as national parks and sanctuaries, wildlife cleareance form the standing committee of national board for wildlife (NBWL) has to be obtained. According to the guidelines issued by the GOI the cleareance under the national board for wildlife is mandatory.

The plan showing the proposed Eco sensitive zone of the Cauvery North Wild Life sanctuary.


NORTH
North Cauvery Wildlife Sanctuary
LEGEND:
North Cauvery Wildlife Sanctuary
1Km Radius
5Km Radius
10Km Radius


PROPOSED ECO SENSITIVE ZONE OF CAUVERY NORTH WILDLIFE SANCTUARY
KARNATAKA STATE
KRISHNAGIRI DISTRICT
KARNATAKA STATE
KRISHNAGIRI DISTRICT
DHARMAPURI DISTRICT
ABSTRACT
Area in Ha
Area Covered by 15 Enclaves Within Sanctuary (ESZ) 4017.12
Area Covered by 150 Villages Within ESZ 40516.72
Area Covered by Reserved Forests within ESZ 12156.64
Total Area Covered under ESZ 56690.48
1 cm = 1 km
KEY POINTS WITH GPS READINGS
Legend
Granite Quarry
Roughstone Quarry
Key Points Around ESZ
Migratory Path Of Elephants
Eco Sensitive Zone
Eco Sensitive Zone Proposed by District Collector in Krishnagiri(10Km Radius)
Eco Sensitive Zone Proposed by District Collector in Krishnagiri (5Km Radius)
Eco Sensitive Zone Proposed by Forest Department
R.F Within Eco Sensitive Zone
Enclaves Within Sanctuary (ESZ)
District Boundary
State Boundary

21. Impact on the Environment (Air, Water, Noise, Soil Flora & Fauna, Land use, Agriculture, Forest etc.,) due to Mining Activity "

Mining and allied operations may affect the existing environmental setup in the area unless proper mitigation measures are not taken. Hence it is essential to assess the impacts of mining on various environmental parameters so that abatement measures could be planned in advance for systematic, sustainable and eco-friendly mining in the area.

21.1 Air Environment :

The mining and allied operations may cause deterioration of air quality due to pollution if prompt care is not taken. The principal sources of air pollution in general due to mining and allied activities will be the dust generation in the mine due to:

- Excavation of granite blocks.
- Movement of HEMM such as excavators, tippers etc.,
- Loading and unloading operation
- Overburden & granite transportation

Beside the above mentioned fugitive dust emissions, atmospheric fugitive dust emissions, atmospheric pollution can occur as a result of emission of SO_2, Nox, CO etc., from diesel driven mining equipment, compressors, generators etc., Larger suspended particles are generally filtered in the nose and throat and do not cause problems.

Particulate matter smaller than 10 microns, referred to as PM10, cn settle in the bronchi and lungs and cause health problems like Bronchitis, Emphysema, Bronchi Asthma, Irritation of mucus membranes of eyes etc. Particles smaller than 2.5 micrometers (PM 2.5), tend to penetrate into the lungs and very small particles (<100 nanometers) may pass through the lungs to affect other programs.

21.2 Water Environment

The major sources of water pollution normally associated due to mining and allied operations are:

- Disturbance to drainage course or water bodies in the project area, if any.
- Generation of Industrial effluent water from workshop, service building.
- Washouts from waste dumps/embankment, if any.
- Domestic effluent
- Mine discharge water pumped out from opencast mines, if any and affect on ground water table.
- Direct impact on human beings due to poor water quality consequent to mining operation can lead to various water borne diseases like diarrhoea, jaundice, dysentery, typhoid etc. Besides, the polluted water may not be useful for animal or human consumption, vegetation and may affect aquatic life, if effluents are not properly treated to remove the harmful pollutants.

21.3 Noise & Vibration :

The impact prediction and control measure for noise environment due to mining and allied activities are described below:

Noise is one of the inevitable causes of pollution in mining operations largely due to the extensive mechanization adopted. Since the Granite in the District are in very hard form, hence drilling and blasting is required for the excavation. Hence the major source of noise will be from by blasting activity and by the equipment's used such as Excavation, loading & unloading & movement of vehicles etc., will produce noise of considerable magnitude in mining operations. Prolonged exposure to a high noise level is harmful to the human auditory system and can create mental fatigue, rebellious attitude, annoyance and carelessness, which may lead to neglect of work and also results in accidents.

Since, the rock formations in this district belongs mainly to

Archaean age and are hard in nature, quarrying activity requires drilling and blasting makes vibrations

21.4 Impact on Land Environment:

Mining can cause physical disturbances to the landscape, creating eyesores such as waste-rock piles and open pits. Such disturbances may contribute to the decline of wildlife and plant species in an area. In addition, it is possible that many of the premining surface features cannot be replaced after mining ceases. Mine subsidence (ground movements of the earth's surface due to the collapse of overlying strata and sliding of quarry side portions) can cause damage to buildings and roads.

21.5 Impact on Biological Environment:

The major possible impact on biological environment due to mining is given below:

- Clearance of vegetation due to mining and allied activities
- Retardation of tree growth, tip burning etc., due to deposition of dust and the particulate matter generated from the mining operation.
- Presence of Schedule-I fauna in the mining area.
- Proposed impact on surface water quality that also provides water to wildlife
- Risk of fall/slip or cause death to wild animals due to project activities
- The project releases effluents into water bodies that also supplies water to wildlife
- Diversion of Agricultural and forest lands for mining

22. Remedial Measure to mitigate the impact of Mining on the Environment:

The following remedial measures to be taken during mining

22.1 Remedial Measures to mitigate Air Pollution :

- The emission of contaminants to the atmosphere by proper planning and zoning of quarrying areas.
- Water sprinkling on mineral transport road from the mines to the main road
- Black topping of the main transportation roads to the possible extent.
- Avoiding crowding of trucks by properly spacing them to avoid the concentration of dust emission at any time
- Covering the trucks by tarpaulin sheets during ore transportation
- Proper maintenance of HEMM to minimize gaseous emission
- Imparting sufficient training to operators on safety and environmental parameters
- Development of green belt / plantation around mine, along the roads, backfilled area in various undisturbed areas within the mine lease areas etc.,

22.2 Remedial Measures to mitigate water Pollution

- Industrial effluent treatment systems wherever necessary to be introduced and maintained properly.
- Safety barriers to be provided for all water bodies and no mining activities should be carried out in the safety barrier area.
- Mitigative measures like construction of garland drains formation of earth bunds to be followed in the waste dumping areas to avoid wash off.
- Domestic effluents to be treated in scientific manner
- Required statutory clearances to be obtained and all precautionary measures to be adopted wherever pumping of ground water is involved.
- Recycling of water used in crusher units and prevention measures of polluted water into water bodies by proper storage within the unit so as to avoid water contamimation.

22.3 Remedial Measures to reduce Noise & Vibration

- Planting rows of native trees around mine, along the roads, other noise generating centres to act as acoustic barriers.
- Sound proof operator's cabin for equipment may lead to less noise generation.
- Proper and regular maintenance of equipment may lead to less noise generation
- Air silencers of suitable type that can modulate the noise of the engines of machinery to be utilized and will be maintained effectively.
- Providing in-built mechanism for reducing sound emissions.
- Providing ear muff's to workers exposed to higher noise level and to those persons operating or working close to any machine.
- Conducting regular health check-up of workers including Audiometric test for the workers engaged in noise prone area.

22.4 Remedial measures to reduce Impact on Land Environment:

Scientific reclamation measures to be adopted to reduce the impact of land environment due to mining. Quarrying of Granite and Rough stone pits after back filling may be used for land reclamination and the unfilled quarry pits may be used for ground water recharge and as fishery ponds.

22.5 Remedial measures to reduce Impact on Biological environment:

- The quarrying areas in the district are mostly of dry areas, afforestation to be carried out in the quarrying areas.
- Necessary mitigative measures like dust suppression, proper maintenance of equipments, black topping of roads etc., to be carried out to prevent dust generation & any further impact on the vegetation.
- Conservation plan for schedule –I species if any to be prepared in consultation with the Forest Department and the proposals given in the conservation plan to be strictly implemented.
- Effluents generated in the mining areas to be treated properly.

23. Reclamation of Mined out Area (Best practice already implemented

in the district, requirement as per rules and regulations, proposed reclamation plan)

Granite quarrying makes huge pits and simultaneous back filling and development of plantation in the back filled areas as Agricultural / Commercial plantation, will be the best practice of reclamination and the unfilled quarry pits may be used for ground water recharge and also as fishery ponds.

24. Risk Assessment & Disaster Management Plan

Risk Assessment and Disaster Management plan in connection with mining and allied operations should be spelt out in detail to cover possible dangers /risks/explosions/accidents etc., likely to arise from the project operations including onsite and off-site emergency plans to meet the disastrous situations if any.

The management is able to deal with the situation efficiently to reduce confusion keeping in view of the likely sources of danger in the mine.

1) Outline of Disaster management plan :-

The purpose of disaster management plan is to restore the normalcy for early resumption of mining operation due to an unexpected, sudden occurrence resulting to abnormality in the course of mining activity leading to a serious danger to workers or any machinery or the environment.

2) System of communication:-

An internal communication system should be provided. Telephone nos. and addresses of adjoining mines, rescue station, police station, Fire service station, local hospital, electricity supply agency and standing consultative committee members should be properly updated and displayed.

3) Consultative committee:-

A standing consultative committee will be formed under the head of Mines. The members consists of Mines manager /safety officer / medical officer / public relation officer/Foreman/ and environmental engineer.

4) Facilities & Accommodation:-

Accommodation and facilities for medical centre, rescue room and for various working groups shall be provided. Regular checking of these facilities shall be undertaken.

5) First Aid & medical facilities:-

The mine management should be having first aid / medical centre for use in emergency situation. All casualties should be registered and should be given first aid. The centre should have facilities for first aid & minor treatment, resuscitation, ambulance and transport. Proper telephone / wireless should be provided for quick communication with hospitals where the complicated cases are to be referred. Regular checking of these facilities shall be undertaken by the doctor and the in charge of the first aid room.

6) Stores and equipment :-

A detailed list of equipment available, its type & capacity and items reserved for emergency should be maintained.

7) Transport services:-

A well defined transport control system should be provided to deal with the situation.

8) Functions of public relations group:-

Liaison with representatives of the mine workers is required to ameliorate the situation of panic, tension, sentiments, grievances and misgivings created by any disaster. Management is required to ameliorate the injured, survivors and family members of affected persons by providing material, finance, moral support and establishing contact with relatives of victims. The consultative committee formed, especially the nominated public relation officer shall look into these aspects.

9) Security :-

Manning of security posts is very essential during the disaster management.

10) Catering & Refreshment:-

Arrangement will be made for the victims, rescue teams and others.

25. Details of Occupational health issue in the District (last five –year data of number of patients of silicosis & Tuberculosis is also needs to be submitted)

The details of number of patients treated for silicosis and Tuberculosis for the last five years in the district is given below:

Sl. No	Year	Number of patients treated for silicosis	Number of patients treated for Tuberculosis
1	2018	Nil	Nil
2	2017	Nil	Nil
3	2016	Nil	Nil
4	2015	Nil	Nil
5	2014	Nil	Nil

26. Plantation and Green belt development in respect of leases already granted in the district.

The project proponents during the quarry operations, it is necessary to develop Green belt in and around the polluted site with suitable species to reduce the air and noise pollution effectively. Implementation of afforestation program by planting 250 to 500 Neem and Pungan trees is paramount importance. In addition to augmenting existing vegetation, it also checks soil erosion, make the ecosystem more complex and functionally more stable and make the climate more conductive.

27. Any other Information

---------- Nil ----------

Deputy Director,
Geology and Mining,
Krishnagiri.

District Collector,
Krishnagiri.

From
Thiru L. Suresh, M.Sc.,
Deputy Director,
Geology and Mining,
Krishnagiri.

To
The Chairman,
Tamil Nadu State Environment,
Impact Assessment Authority,
3rd Floor, Panakal Maligai,
No. 1 Jeenes Road,
Saidapet, Chennai -15.

Roc. 335 /2015 (Mines-1) Dated .06.2016

Sir,

Sub: Mines and Mienrals – Minor Mineral – Colour Grnaite – Krishnagiri District - Denkanikottai Taluk - Jakkeri Village – Government land S.F Nos. 486/1,2 736/4 over an extent of 27.04.5 Hectares – quarry lease granted to Tvl. TAMIN Ltd, – Details of quarries situated within 500 Mts radial distance – Requested by the applicant – Furnished –reg.

Ref: 1 G.o Ms No. 238 Ind.Dept. Dated 17.3.99.
2 M/s. TAMIN Ltd, Krishnagiri Division Letter Dated 06.06.2016.

I am to invite kind attenstion to the reference cited.

A quarry lease for Colour Granite had been granted to M/s. TAMIN Ltd, over an extent of 27.04.5 Hect in Government land S.F Nos. 486/1,2 736/4 in Jakkeri Village, of Denkanikottai Taluk, Krishnagiri District for a period of 30 years vide G.o Ms No. 238 Ind.Dept. Dated 17.3.99 under the provisions of Rule 8 (C) of Tamil Nadu Minor Mineral Concession Rules, 1959. The lease deed had been executed on 21.6.1999 and the lease period is valid upto 20.6.2019.

In the reference 2nd cited the applicant has requested to furnish the details of other quarries situated within 500 mts radial distance from the said quarry in order to obtained Environmental Clearance from the SEIAA of Tamilnadu.

In this regard, the details of the quarries situated within 500 mts radial distance from the proposed quarry are furnished as follows.

Sl. No.	Name of the lessee/applicant	Village	S.F Nos.	Extent in Hect	G.O.No.	Lease period.
1.	M/s. TAMIN Ltd	Jakkeri	486/1,2 736/4	27.04.5	G.o Ms No. 238 Ind.Dept. Dated	21.6.99 to 20.6.2019

					17.3.99	
2	Tvl. Pluto D Granite, No. 15-C Nethaji Bye pass Road, Dharmapuri.	Pachappanatti (v)	347 (p)	1.96.0	G.O.3D No 120 Ind Dept. Dt.5.5.95	27.7.95 to 26.7.2005
3	TAMIN	Jakkeri	381,389, 486	38.59.0	--	Lease applied area
	Total			40.55.0		

Deputy Director,
Geology and Mining,
Krishnagiri.

To
M/s. TAMIN Ltd,
Krishnagiri Division,
65/19A, Thammanna Nagar,
1st Cross, Krishnagiri 635 001.

24-6-00/G.

-283-

491

TAMILNADU FOREST DEPARTMENT

From,
Subrat Mohapatra, I.F.S.,
Principal Chief Conservator of Forests
(Head of Forest Force),
Forest Headquarters Building,
Guindy Velachery Main Road,
Near Kannigapuram Check post,
Guindy, Chennai - 600032.

To,
The Commissioner,
Directorate of Town and Country
Planning, CMDA office complex,
(2,3,4th floor), E&C Market Road,
Koyambedu,
Chennai 600 107.

24 APR 2023

Ref. K.Dis.No.TS2/7275/2022, Dated: 19.04.2023

Sir,

Sub: Hill Area Conservation Authority clearance - Mines and Minerals – Krishnagiri District – Denkanikottai Taluk – Jakkery Village – Government land - SF.No.486 (part) (22.40.0) and 736/4 (4.64.5) – 27.04.5 Ha – For extraction of Grey Granite quarry by Tamil Nadu Minerals Limited, Chennai - Forest No Objection Certificate sought for – proposal received – Regarding.

Ref: 1. District Collector, Krishnagiri Ref.No.829/2018/Mines, dt.02.03.2022.

2. Wildlife Warden, Hosur Division Ref.No.2529/2022/L, dt.06.03.2023.

3. Conservator of Forests, Dharmapuri Ref.No.2509/2023/D, dt.23.03.2023.

&&&&&

The Wildlife Warden, Hosur division has sent a proposal for Hill Area Conservation Authority clearance for extraction of Grey Granite quarry by Tamil Nadu Minerals Limited, Chennai for an area of 27.04.5 Ha in Government land SF.No.486 (part) (22.40.0) and 736/4 (4.64.5) of Jakkeri village, Denkanikottai Taluk of Krishnagiri District.

The Wildlife Warden, Hosur has reported that, the proposed site is located **2.70 km** (Aerial Distance) away from Udedurgam Reserved Forest (Part of Cauvery North Wildlife Sanctuary) and **25.40 km** away from the boundary of Cauvery South

Wildlife Sanctuary (Kesarakuli Reserved Forest of Dharmapuri Division). The proposed lands are not falling in any Eco Sensitive zone of protected area, officially declared Elephant Corridor, and TNPPF Act areas. The area falls in Tamil Nadu Hill Area Preservation Act, 1955 notified area and no standing trees in the area. There is no endangered flora and fauna. There will not be any negative impact upon the forest due to this project. Hence, it may be recommended subject to the following conditions.

a) A barbed wire fence should be erected around the mining area.
b) The quarrying operation should be carried out between 6.00 am to 6.00 pm.
c) Green belt should be created all along the boundary of the lease granted area by planting 1000 or above taller seedlings of tree species.
d) They may be requested to contribute CSR Fund for creating fence along the Reserve Forest boundary.
e) Vehicles carrying mining material should not utilize forest road meant for forestry purposes.
f) The vehicles carrying mining material shall make available for checking whenever a forest officer intends to check to ascertain the genuineness of the proceeds and quarry.

As recommended by the Wildlife Warden, Hosur the above proposal is forwarded for consideration of Hill Area Conservation Authority. Subject to condition that necessary Environmental clearance from Ministry of Environment, Forest & Climate Change department should be obtained if necessary before granting permission. The conditions imposed by the Wildlife Warden, Hosur should be complied with.

Yours faithfully,
Sd/- A.Deivendran,
for Principal Chief Conservator of Forests
(Head of Forest Force)

Copy to

1. The District Collector, Krishnagiri district.
2. The Wildlife Warden, Hosur.
3. Hill Area Conservation Authority proceedings stock file.
4. Spare 1.

/True copy/By Order/

Senior Draughtsman Officer

29/7/20

DEPARTMENT OF GEOLOGY AND MINING

From
Thiru.E.Saravanavelraj, I.A.S.,
Director,
Department of Geology and Mining,
Guindy, I. E., Chennai – 600 032.

To
The Managing Director,
Tvl.Tamin Ltd.,
No.31, Kamarajar Salai,
TWAD House, Chepauk,
Chennai - 5.

Rc.No.553/MM4/2020 dated 27.07.2020

Madam,

Sub: Mines and Minerals – Minor Mineral – Multi-coloured Granite – Krishnagiri district – Denkanikottai taluk – Jakkery village - over an extent of 27.04.5 ha of Poramboke lands - S.F.No.486/1, 486/2 & 736/4 – Quarry lease granted to Tvl.Tamin Ltd. - Mines operated without Environmental Clearance – Cost of mineral remitted to anamount of Rs.2,01,74,270/- - NOC requested – Issued - Reg.

Ref: 1. Tvl.Tamin Ltd., letter No.8224/ML5/2019 dated 24.01.2020.
2. District Collector, Krishnagiri letter in Rc.No.1042/2018/Mines dated 14.01.2020

Kind attention is invited to the references cited.

2) Tvl.Tamin Ltd., was granted a quarrying lease for multi-coloured granite over an extent of 27.04.5 ha in S.F.No.486/1, 486/2 & 736/4 of Jakkery village, Denkanikottai taluk, Krishnagiri district for a period of 20 years under Rule 8-C of Tamil Nadu Minor Mineral Concession Rules, 1959. The lease period is from 21.06.1999 to 20.06.2019.

3) As per the Hon'ble Supreme Court order dated 02.08.2017 in W.P. Civil No.114/2014 in the matter of Common Cause Vs Union of India and Ors. has passed a detailed order interpreting Section 21(5) of the MMDR Act, 1957 directing that wherever violations were carried out, 100% cost value of the mined mineral needs without environmental clearance to be compensated by the mining entity / project proponent.

4) In this regard, the District Collector, Krishnagiri has stated that Tvl.Tamin Ltd., had operated the above said quarry in the violation period from 15.01.2016 to 10.01.2017 and obtained transport permit for a quantity of 1634.603 cbm. Hence, Tvl.Tamin Ltd., is liable for remittance of 100% cost of mineral.

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Therefore, as per the demand notice issued by the District Collector, Tvl.Tamin Ltd., has paid the cost of mineral of Rs.2,01,74,270/- vide challan no.nil dated 11.12.2019 for the mineral transported without environment clearance. Hence, the District Collector, Vellore recommended to issue NOC to Tvl.Tamin Ltd., for getting environmental clearance

5) Since, Tvl.Tamin Ltd., has paid the cost of mineral for the mineral transported in the violation period without environment clearance and based on the recommendation of the District Collector, Krishnagiri, No Objection Certificate is issued to Tvl.Tamin Ltd., for getting environment clearance for the quarry located in S.F.No. 486/1, 486/2 & 736/4 over an extent of 27.04.5 ha of poramboke land in Jakkery village, Denkanikottai taluk, Krishnagiri district subject to a condition that Tvl.Tamin Ltd., should remit any excess dues arises in future in this regard.

Sd /- E.Saravanavelraj,
Director of Geology and Mining

Forwarded / By Order

Joint Director

மாவட்டம் : கிருஷ்ணகிரி

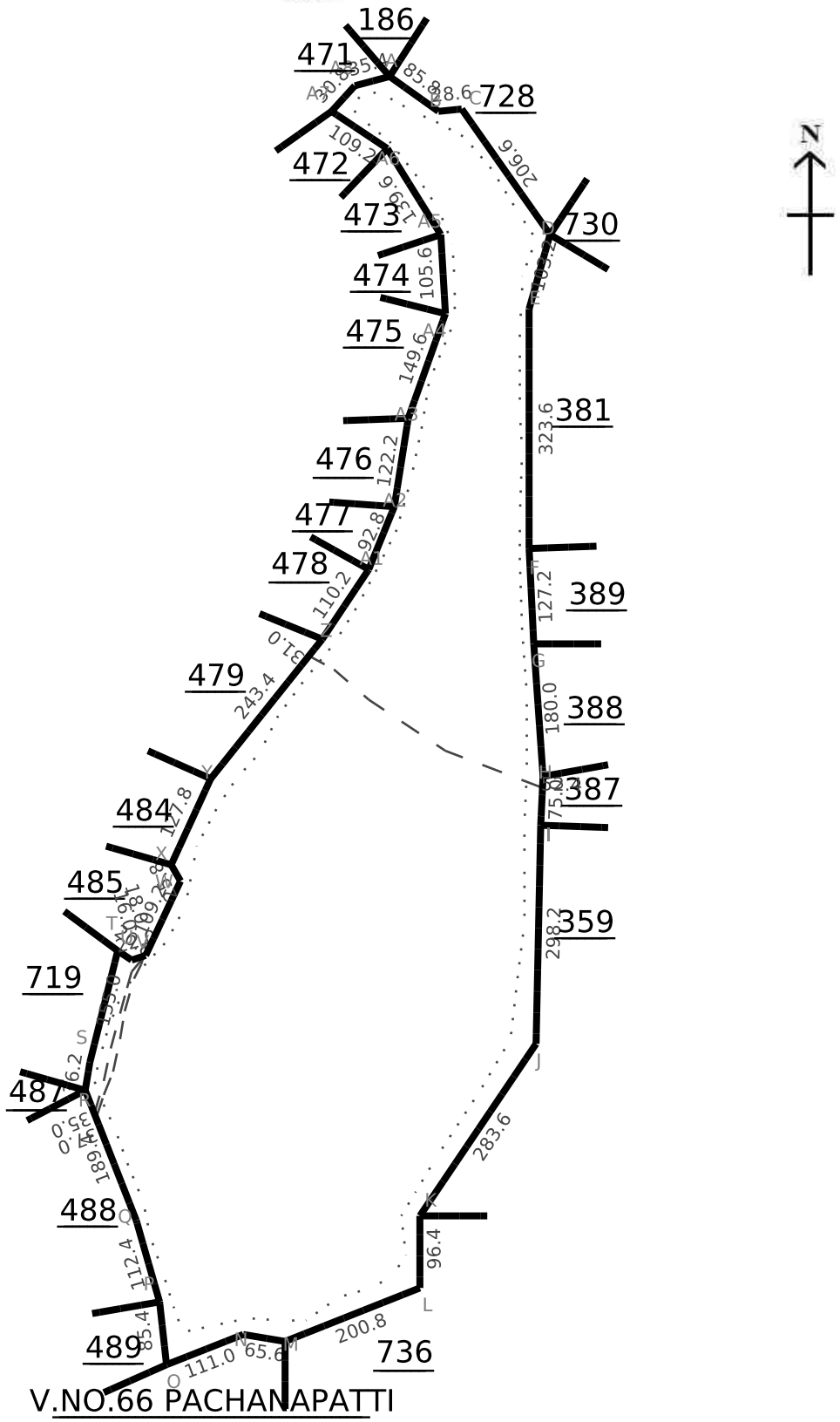
வட்டம் : டெங்கனிகோட்டா

கிராமம் : ஜெக்கேரி [65]

புல எண் : 486

பரப்பளவு : எக்டர் 48 ஏர் 89.00

அளவு : 1 : 8891



Signed By Tahsildar

Name of approver : mani

Date of Approval : 14-12-2018

Date of Issue: 09-08-2024 12:11:31

மாவட்டம் : கிருஷ்ணகிரி

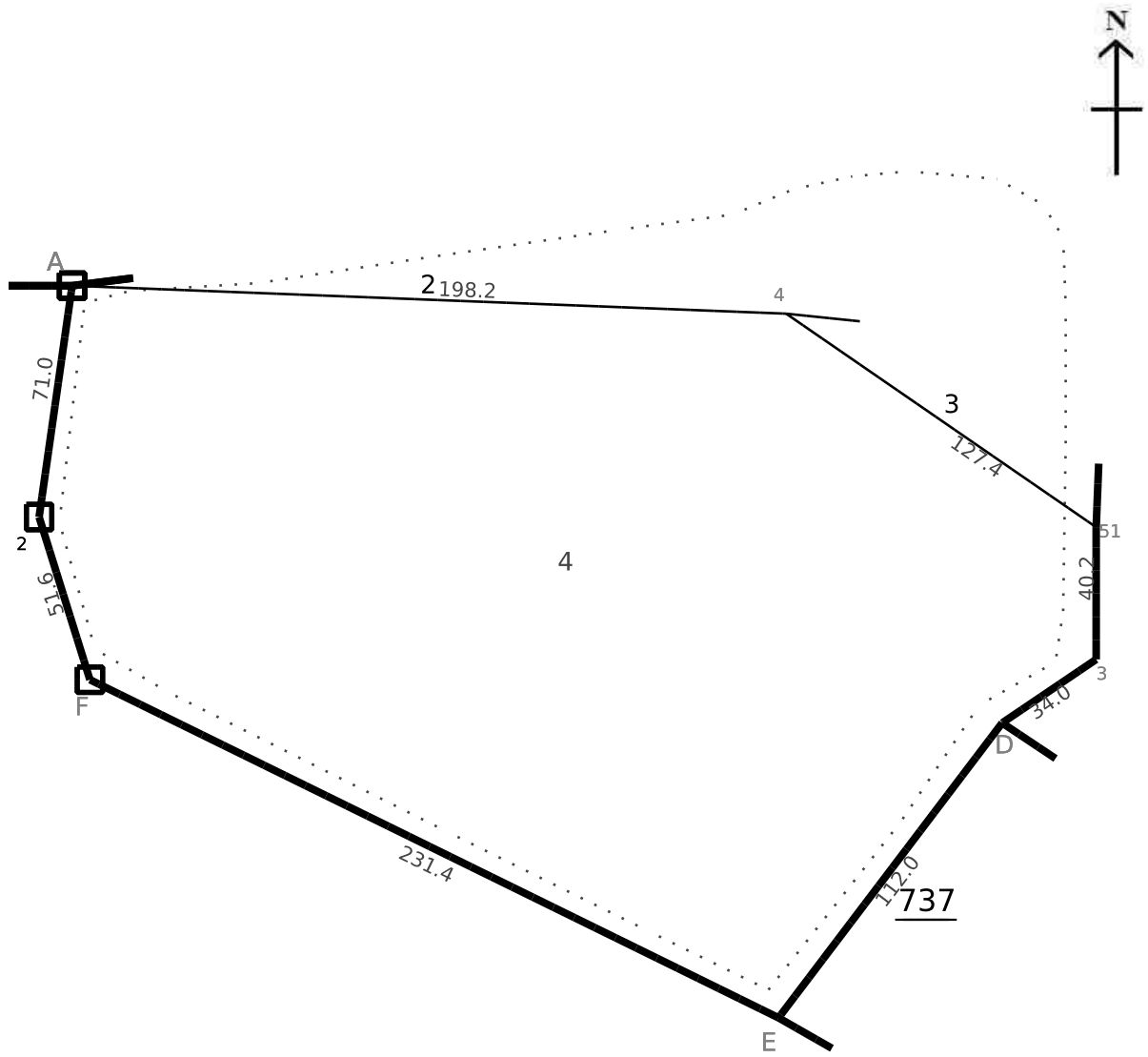
வட்டம் : டெங்கனிகோட்டா

கிராமம் : ஜெக்கேரி [65]

புல எண் : 736/4

பரப்பளவு : எக்டர் 04 ஏர் 64.50

அளவு : 1 : 2172



Signed By Tahsildar

Name of approver : mani

Date of Approval : 04-12-2017

Date of Issue: 09-08-2024 12:12:46

Survey and Settlement Department, Government of TamilNadu

கலைஞர் 100
1924 - 2023

Town and Country Planning Department

From
Thiru. B.Ganesan, I.A.S.,
Member Secretary,
Hill Area Conservation Authority /
Director of Town and Country Planning,
CMDA complex,
E & C Market Road,
Koyambedu, Chennai – 600 107.

To
The District Collector,
Krishnagiri District.

03 AUG 2023

04 AUG 2023

Roc. No.11938/2023/HACA, Dated:26.07.2023

Madam,

Sub: Hill Area – Mines and Minerals – Minor Mineral – Colour Granite – Krishnagiri District – Denkanikottai Taluk – Jakkeri Village – Government Land in S.F.Nos:486pt & 736/4 - Extent of 27.04.05 Hectares – Quarry lease renewal - Proposal - HACA Clearance requested – Regarding.

Ref:
1. The District Collector, Krishnagiri Letter Roc No:829/2018/Mines, dated:16.05.2023.
2. Technical report of the Assistant Director (i/c) (Mines) of Geology and Mining, Krishnagiri, dated:27.09.2019.
3. The Principal Chief Conservator of Forests, Chennai Letter No:K.Dis.TS2/7275/2022, dated:19.04.2023.
4. The Chief Engineer, Agriculture Engineering Department, Chennai Letter No. மபாஆ(க)1/10957/2022, dated:13.04.2023.
5. Extract of the 80th HACA meeting minutes. Agenda No:28 dated:26.06.2023.

With reference to the 5th cited above, it is informed that the subject was placed before the 80th HACA meeting held on 26.06.2023 as Agenda No.28 and decided as follows.

The HACA recommended the proposal for Quarry lease renewal of Colour Granite in S.F.Nos:486pt & 736/4 with extent of 27.04.05 Hectares of Government Lands in Jakkeri Village, Denkanikottai Taluk, Krishnagiri District subject to the conditions imposed by the Geology and Mining Department, Forest Department, Agricultural Engineering Department and Revenue Department.

A copy of the extract of the Minutes is enclosed and requested to take necessary action as per the decision of the HACA.

Enclosure:
Extract of the 80th HACA
meeting minutes. Agenda No:28

(Sd)/- B. Ganesan,
Director of Town and Country Planning.

Copy to:
M/s. Tamil Nadu Mineral Limited.
31. Kamarajar Salai.
Chennai – 600 005.

/ Forwarded by Order/

Deputy Director of Town and Country Planning.

Extract of the Agenda No.28 of the Minutes of the 80th meeting of the Hill Area Conservation Authority Held on 26.06.2023 at 03.00 P.M. in the Conference Hall, III floor, Namakkal Kavignar Maaligai, Secretariat, Chennai – 600 009.

Agenda 28: Hill Area – Mines and Minerals – Minor Mineral – Colour Granite – Krishnagiri District – Denkanikottai Taluk – Jakkeri Village – Government Land in S.F.Nos:486pt & 736/4 - Extent of 27.04.05 Hectares – Quarry lease renewal - Proposal - HACA Clearance requested – Regarding.

(DTCP File No. 11938/2023 HACA, Applicant: M/s. TAMILNADU MINERALS LIMITED)

The HACA recommended the proposal for Quarry lease renewal of Colour Granite in S.F.Nos:486pt & 736/4 with extent of 27.04.05 Hectares of Government Lands in Jakkeri Village, Denkanikottai Taluk, Krishnagiri District subject to the conditions imposed by the Geology and Mining Department, Forest Department. Agricultural Engineering Department and Revenue Department.

(Sd/-) B. Ganesan,
Member Secretary,
Hill Area Conservation Authority /
Director of Town and Country Planning,
CMDA Complex, E & C Market Road,
Koyambedu, Chennai – 600 107.

(Sd/-) Apoorva,
Chairman, Hill Area Conservation Authority /
Principal Secretary,
Housing and Urban Development Department.
Secretariat,
Chennai – 600 009.

/Forwarded by order/

Deputy Director of Town and Country Planning.

From

Thiru L. Suresh M.Sc.,
Deputy Director,
Dept of Geology and Mining,
Krishnagiri.

To

The Divisional Manager,
M/s.TAMIN Ltd,
Krishnagiri.

Roc.838/2019/Mines dated ٥٦.09.2019

Sir,

Sub: Mines and Minerals – M/s.Tamin obtaining of EIA clearance for sulamalai SF.No.283/P & Jakkery SF.No.486/P & 736/4 – details of permit taken quantity – issued – Reg.

Ref: 1.M/s.Tamin,Krishnagiri.Roc.No.463/D/2018 dt:27.08.2019.

I invite your kind attention to the reference cited.

In the reference letter you have requested the details of permit issued quantity for sulamalai SF.No.283/P & Jakkery SF.No.486/P & 736/4 quarries. To provide the same for Environment Impact Assessment clearance.

The details of permit issued quantity for the above said quarries are as follows.

Sl.No	Name of the quarry	SF.No	Period	Qty in Cbm
1	Sulamalai (Colour Granite)	283 & 247	1994 -1995 to 2016-2017	30284-263 Cbm
2	Jakkery (Colour Granite)	486/P & 736/4	1994 -1995 to 2017-2018	12548.080 Cbm

Deputy Director,
Dept of Geolgoy and Mining,
Krishnagiri.

Encl: Annexure.

Details of Transport permit obtained TVL.TAMIN, ltd,

FROM 1994-1995 to 2017-2018

Name of the lessee :- Tvl.Tamil nadu Minerals Limited, Chennai

Taluk: Denkanikottai **S.F.No. 486&736/4**

Village: JAKKERY **Extent:27.04.5Ha**

SL.No	Year	Permit Quanity
01	1994-1995	1722.625
02	1995-1996	1302.843
03	1996-1997	521.916
04	1997-1998	414.672
05	1998-1999	170.050
06	1999-2000	310.515
07	2000-2001	891.858
08	2001-2002	NIL
09	2002-2003	NIL
10	2003-2004	NIL
11	2004-2005	144.633
12	2005-2006	NIL
13	2006-2007	1080.826
14	2007-2008	968.948
15	2008-2009	230.297
16	2009-2010	7.254
17	2010-2011	298.917
18	2011-2012	NIL
19	2012-2013	293.941
20	2013-2014	437.144
21	2014-2015	541.014
22	2015-20016	1937.831
23	2016-2017	1272.796
24	2017-2018	NIL
	Total	12548.080cbm

DEPUTY DIRECTOR
Geology and Mining,
Collectorate, Krishnagiri.

6/9/19

CERTIFICATE

Certified that, M/s. Tamilnadu Minerals Limited operating Colour Granite Quarry at Jakkery Village SF.NO. 486(p), 736/4, Denkanikottai Taluk, Krishnagiri Dist. There is no any habitation in 300 meters radius from lease hold area.

01/07/16

கிராம நிர்வாக அலுவலர்
65, ஜெக்கேரி,
தேன்கனிக்கோட்டை (வட்டம்),
கிருஷ்ணகிரி மாவட்டம்

CERTIFICATE

Certified that, M/s. Tamilnadu Minerals Limited operating Colour Granite Quarry at Jakkery Village SF.NO. 486(p), 736/4, Denkanikottai Taluk, Krishnagiri Dist. The distance of inter-State boundary from the above quarry site is more than 5.KM.

23/06/16

கிராம நிர்வாக அலுவலர்
65, ஜெக்கேரி,
தேன்கனிக்கோட்டை (வட்டம்),
கிருஷ்ணகிரி மாவட்டம்

Revenue Inspector
Kelavangalam, Denkanikottai-Tk,
Krishnagiri-Dt.

Jakkery Colour Granites

Year	Month	Date	HH	tmpf	dwpf	relh	Wind speed m/s	Wind Speed miles/hr	drct	sknt	p01i	vsby	skyc1	skyc2	skyl1	wh/m2	mslp bar
2024	3	1	0	77	66.2	69.33	3.15234	1.409222	320	3	0	3.11	FEW	2	2000	0	1001
2024	3	1	1	82.4	64.4	54.55	3.15234	1.409222	340	3	0	3.11	FEW	2	2000	18.8	1000
2024	3	1	2	86	59	40.14	3.15234	1.409222	10	3	0	3.73	FEW	2	2000	325.73	999
2024	3	1	3	89.6	57.2	33.56	3.15234	1.409222	30	3	0	4.35	FEW	2	2000	866.03	999
2024	3	1	4	89.6	57.2	33.56	3.15234	1.409222	180	3	0	4.35	SCT	4	2000	953.75	998
2024	3	1	5	89.6	55.4	31.45	3.15234	1.409222	220	3	0	4.35	SCT	4	2000	985.05	998
2024	3	1	6	93.2	55.4	28.1	4.20312	1.878963	220	4	0	4.35	SCT	4	2000	979.63	997
2024	3	1	7	93.2	53.6	26.31	3.15234	1.409222	160	3	0	4.35	SCT	4	2000	969.79	996
2024	3	1	8	93.2	53.6	26.31	4.20312	1.878963	210	4	0	4.35	SCT	4	2000	949.67	995
2024	3	1	9	93.2	53.6	26.31	5.2539	2.348703	200	5	0	4.35	SCT	4	2000	901.22	1000
2024	3	1	10	75.2	60.8	60.9	3.15234	1.409222	250	3	0	3.73	SCT	4	2000	807.23	1001
2024	3	1	11	78.8	62.6	57.6	2.10156	0.939481	180	2	0	3.73	SCT	4	2000	627.99	1001
2024	3	1	12	80.6	60.8	50.95	2.10156	0.939481	180	2	0	3.73	SCT	4	2000	357.27	1001
2024	3	1	13	82.4	60.8	48.05	3.15234	1.409222	280	3	0	3.73	SCT	4	2000	0	1000
2024	3	1	14	82.4	60.8	48.05	4.20312	1.878963	210	4	0	3.73	SCT	4	2000	0	1000
2024	3	1	15	84.2	57.2	39.86	2.10156	0.939481	180	2	0	3.73	SCT	4	2000	0	999
2024	3	1	16	86	55.4	35.25	5.2539	2.348703	200	5	0	3.11	SCT	4	2000	0	999
2024	3	1	17	86	55.4	35.25	5.2539	2.348703	200	5	0	3.11	FEW	2	2000	0	998
2024	3	1	18	87.8	53.6	31.17	3.15234	1.409222	200	3	0	3.11	FEW	2	2000	0	997
2024	3	1	19	89.6	53.6	29.45	3.15234	1.409222	200	3	0	3.73	FEW	2	2000	0	996
2024	3	1	20	91.4	53.6	27.83	2.10156	0.939481	180	2	0	3.73	FEW	2	2000	0	996
2024	3	1	21	91.4	51.8	26.05	2.10156	0.939481	180	2	0	3.73	FEW	2	2000	0	995
2024	3	1	22	93.2	50	23.04	2.10156	0.939481	180	2	0	3.73	FEW	2	2000	0	994.3333
2024	3	1	23	95	50	21.79	6.30468	2.818444	200	6	0	4.35	FEW	2	2000	0	994.3333
2024	3	2	0	93.2	51.8	24.63	4.20312	1.878963	220	4	0	4.35	FEW	2	2000	0	994.3333
2024	3	2	1	93.2	50	23.04	7.35546	3.288185	150	7	0	4.35	FEW	2	2000	18.8	994.3333
2024	3	2	2	93.2	51.8	24.63	3.15234	1.409222	250	3	0	4.35	FEW	2	2000	325.73	994.3333

2024	3	2	3	91.4	57.2	31.72	3.15234	1.409222	240	3	0	4.35	FEW	2	2000	866.03	999
2024	3	2	4	77	68	73.78	4.20312	1.878963	350	4	0	2.49	SCT	4	2000	953.75	1000
2024	3	2	5	80.6	66.2	61.58	4.20312	1.878963	10	4	0	3.11	SCT	4	2000	985.05	1000
2024	3	2	6	84.2	64.4	51.47	3.15234	1.409222	40	3	0	3.11	SCT	4	2000	979.63	999
2024	3	2	7	86	60.8	42.8	2.10156	0.939481	180	2	0	3.11	SCT	4	2000	969.79	998
2024	3	2	8	89.6	57.2	33.56	3.15234	1.409222	200	3	0	3.11	SCT	4	2000	949.67	997
2024	3	2	9	91.4	53.6	27.83	2.10156	0.939481	180	2	0	3.11	SCT	4	2000	901.22	996
2024	3	2	10	93.2	51.8	24.63	3.15234	1.409222	10	3	0	3.11	SCT	4	2000	807.23	996
2024	3	2	11	93.2	51.8	24.63	6.30468	2.818444	140	6	0	3.11	SCT	4	2000	627.99	995
2024	3	2	12	93.2	51.8	24.63	3.15234	1.409222	140	3	0	3.73	SCT	4	2000	357.27	994.3333
2024	3	2	13	95	51.8	23.3	4.20312	1.878963	130	4	0	3.73	SCT	4	2000	0	993.3333
2024	3	2	14	95	51.8	23.3	7.35546	3.288185	200	7	0	3.73	SCT	4	2000	0	993.3333
2024	3	2	15	95	51.8	23.3	6.30468	2.818444	200	6	0	3.73	SCT	4	2000	0	993.3333
2024	3	2	16	95	53.6	24.89	3.15234	1.409222	180	3	0	3.73	SCT	4	2000	0	993.3333
2024	3	2	17	95	53.6	24.89	5.2539	2.348703	190	5	0	3.73	SCT	4	2000	0	999
2024	3	2	18	77	66.2	69.33	3.15234	1.409222	250	3	0	3.11	SCT	4	2000	0	999
2024	3	2	19	78.8	68	69.52	3.15234	1.409222	340	3	0	3.11	SCT	4	2000	0	999
2024	3	2	20	80.6	68	65.54	3.15234	1.409222	220	3	0	3.11	SCT	4	2000	0	999
2024	3	2	21	84.2	68	58.32	4.20312	1.878963	250	4	0	3.11	SCT	4	2000	0	998
2024	3	2	22	86	66.2	51.72	3.15234	1.409222	280	3	0	3.11	SCT	4	2000	0	998
2024	3	2	23	87.8	66.2	48.84	3.15234	1.409222	100	3	0	3.11	SCT	4	2000	0	997
2024	3	3	0	87.8	60.8	40.41	4.20312	1.878963	130	4	0	3.11	SCT	4	2000	0	997
2024	3	3	1	89.6	59	35.81	3.15234	1.409222	240	3	0	3.11	SCT	4	2000	18.8	996
2024	3	3	2	91.4	57.2	31.72	4.20312	1.878963	220	4	0	3.11	SCT	4	2000	325.73	995
2024	3	3	3	91.4	55.4	29.72	3.15234	1.409222	180	3	0	3.11	SCT	4	2000	866.03	994.3333
2024	3	3	4	95	55.4	26.58	3.15234	1.409222	160	3	0	3.11	SCT	4	2000	953.75	993.3333
2024	3	3	5	95	55.4	26.58	5.2539	2.348703	150	5	0	3.11	SCT	4	2000	985.05	993.3333
2024	3	3	6	95	53.6	24.89	4.20312	1.878963	180	4	0	3.11	SCT	4	2000	979.63	998
2024	3	3	7	75.2	69.8	83.32	3.15234	1.409222	70	3	0	3.11	SCT	4	2000	969.79	999
2024	3	3	8	80.6	69.8	69.71	3.15234	1.409222	340	3	0	3.11	SCT	4	2000	949.67	999
2024	3	3	9	82.4	69.8	65.74	3.15234	1.409222	230	3	0	3.11	SCT	4	2000	901.22	998
2024	3	3	10	84.2	69.8	62.03	3.15234	1.409222	200	3	0	3.11	SCT	4	2000	807.23	998

2024	3	3	11	86	66.2	51.72	3.15234	1.409222	10	3	0	3.11	SCT	4	2000	627.99	998
2024	3	3	12	89.6	66.2	46.14	4.20312	1.878963	250	4	0	3.11	SCT	4	2000	357.27	997
2024	3	3	13	89.6	62.6	40.69	4.20312	1.878963	240	4	0	3.11	SCT	4	2000	0	996
2024	3	3	14	91.4	57.2	31.72	4.20312	1.878963	140	4	0	3.11	SCT	4	2000	0	996
2024	3	3	15	91.4	57.2	31.72	4.20312	1.878963	150	4	0	3.11	SCT	4	2000	0	995
2024	3	3	16	95	57.2	28.37	4.20312	1.878963	180	4	0	3.11	SCT	4	2000	0	994.3333
2024	3	3	17	95	55.4	26.58	4.20312	1.878963	290	4	0	3.73	SCT	4	2000	0	993.3333
2024	3	3	18	96.8	44.6	16.83	4.20312	1.878963	160	4	0	3.73	SCT	4	2000	0	993.3333
2024	3	3	19	96.8	44.6	16.83	5.2539	2.348703	140	5	0	3.73	SCT	4	2000	0	993.3333
2024	3	3	20	98.6	42.8	14.87	4.20312	1.878963	120	4	0	3.73	SCT	4	2000	0	993.3333
2024	3	3	21	96.8	44.6	16.83	8.40624	3.757926	130	8	0	4.35	FEW	2	2000	0	993.3333
2024	3	3	22	96.8	44.6	16.83	8.40624	3.757926	110	8	0	4.35	FEW	2	2000	0	993.3333
2024	3	3	23	95	48.2	20.38	8.40624	3.757926	110	8	0	4.35	FEW	2	2000	0	993.3333
2024	3	4	0	95	50	21.79	8.40624	3.757926	110	8	0	4.35	FEW	2	2000	0	999
2024	3	4	1	77	66.2	69.33	3.15234	1.409222	250	3	0	3.11	FEW	2	2000	18.8	999
2024	3	4	2	80.6	69.8	69.71	3.15234	1.409222	250	3	0	3.11	FEW	2	2000	325.73	999
2024	3	4	3	84.2	69.8	62.03	3.15234	1.409222	220	3	0	3.11	FEW	2	2000	866.03	998
2024	3	4	4	86	68	55.04	5.2539	2.348703	220	5	0	3.11	SCT	4	2000	953.75	998
2024	3	4	5	87.8	64.4	45.88	4.20312	1.878963	170	4	0	3.11	SCT	4	2000	985.05	997
2024	3	4	6	91.4	60.8	36.08	5.2539	2.348703	150	5	0	3.11	SCT	4	2000	979.63	996
2024	3	4	7	91.4	51.8	26.05	4.20312	1.878963	200	4	0	3.11	SCT	4	2000	969.79	995
2024	3	4	8	93.2	53.6	26.31	6.30468	2.818444	170	6	0	3.11	SCT	4	2000	949.67	994.3333
2024	3	4	9	95	55.4	26.58	5.2539	2.348703	120	5	0	3.11	SCT	4	2000	901.22	998
2024	3	4	10	77	66.2	69.33	2.10156	0.939481	180	2	0	2.49	SCT	4	2000	807.23	999
2024	3	4	11	82.4	68	61.81	2.10156	0.939481	180	2	0	3.11	SCT	4	2000	627.99	999
2024	3	4	12	84.2	64.4	51.47	2.10156	0.939481	180	2	0	3.11	FEW	2	2000	357.27	998
2024	3	4	13	84.2	64.4	51.47	4.20312	1.878963	210	4	0	3.11	FEW	2	2000	0	998
2024	3	4	14	87.8	62.6	43.07	3.15234	1.409222	220	3	0	3.11	FEW	2	2000	0	998
2024	3	4	15	89.6	62.6	40.69	3.15234	1.409222	300	3	0	3.11	FEW	2	2000	0	997
2024	3	4	16	89.6	55.4	31.45	3.15234	1.409222	210	3	0	3.11	FEW	2	2000	0	996
2024	3	4	17	91.4	53.6	27.83	3.15234	1.409222	60	3	0	3.11	FEW	2	2000	0	995
2024	3	4	18	95	51.8	23.3	5.2539	2.348703	260	5	0	3.73	FEW	2	2000	0	994.3333

2024	3	4	19	96.8	51.8	22.04	6.30468	2.818444	250	6	0	3.73	SCT	4	2000	0	993.3333
2024	3	4	20	96.8	48.2	19.28	5.2539	2.348703	210	5	0	4.35	SCT	4	2000	0	993.3333
2024	3	4	21	98.6	42.8	14.87	8.40624	3.757926	140	8	0	4.35	SCT	4	2000	0	992.3333
2024	3	4	22	98.6	42.8	14.87	5.2539	2.348703	180	5	0	4.35	SCT	4	2000	0	992.3333
2024	3	4	23	96.8	44.6	16.83	5.2539	2.348703	160	5	0	4.35	SCT	4	2000	0	992.3333
2024	3	5	0	96.8	44.6	16.83	6.30468	2.818444	130	6	0	4.35	FEW	2	2000	0	999
2024	3	5	1	78.8	64.4	61.36	2.10156	0.939481	180	2	0	2.49	FEW	2	2000	18.8	999
2024	3	5	2	82.4	62.6	51.21	2.10156	0.939481	180	2	0	2.8	FEW	2	2000	325.73	999
2024	3	5	3	86	62.6	45.61	4.20312	1.878963	190	4	0	3.11	SCT	4	2000	866.03	998
2024	3	5	4	89.6	60.8	38.18	6.30468	2.818444	180	6	0	3.11	SCT	4	2000	953.75	997
2024	3	5	5	89.6	57.2	33.56	5.2539	2.348703	180	5	0	3.11	SCT	4	2000	985.05	997
2024	3	5	6	91.4	53.6	27.83	5.2539	2.348703	200	5	0	3.73	SCT	4	2000	979.63	995
2024	3	5	7	95	51.8	23.3	4.20312	1.878963	170	4	0	3.73	SCT	4	2000	969.79	994.3333
2024	3	5	8	95	50	21.79	5.2539	2.348703	230	5	0	3.73	SCT	4	2000	949.67	994.3333
2024	3	5	9	96.8	50	20.62	5.2539	2.348703	200	5	0	4.35	SCT	4	2000	901.22	993.3333
2024	3	5	10	96.8	50	20.62	4.20312	1.878963	200	4	0	4.97	SCT	4	2000	807.23	993.3333
2024	3	5	11	95	50	21.79	6.30468	2.818444	190	6	0	4.97	SCT	4	2000	627.99	998
2024	3	5	12	80.6	68	65.54	3.15234	1.409222	130	3	0	3.11	SCT	4	2000	357.27	999
2024	3	5	13	84.2	64.4	51.47	3.15234	1.409222	160	3	0	3.11	SCT	4	2000	0	999
2024	3	5	14	86	64.4	48.58	5.2539	2.348703	180	5	0	3.11	SCT	4	2000	0	998
2024	3	5	15	86	66.2	51.72	3.15234	1.409222	200	3	0	3.11	SCT	4	2000	0	998
2024	3	5	16	87.8	66.2	48.84	3.15234	1.409222	160	3	0	3.11	SCT	4	2000	0	998
2024	3	5	17	89.6	62.6	40.69	5.2539	2.348703	140	5	0	3.11	SCT	4	2000	0	997
2024	3	5	18	91.4	62.6	38.45	6.30468	2.818444	280	6	0	3.11	SCT	4	2000	0	996
2024	3	5	19	91.4	60.8	36.08	6.30468	2.818444	240	6	0	3.73	SCT	4	2000	0	995
2024	3	5	20	93.2	59	31.99	4.20312	1.878963	160	4	0	3.73	SCT	4	2000	0	995
2024	3	5	21	95	59	30.26	4.20312	1.878963	200	4	0	4.35	SCT	4	2000	0	994.3333
2024	3	5	22	95	57.2	28.37	4.20312	1.878963	120	4	0	4.35	SCT	4	2000	0	994.3333
2024	3	5	23	95	55.4	26.58	5.2539	2.348703	130	5	0	4.35	SCT	4	2000	0	993.3333
2024	3	6	0	96.8	55.4	25.15	8.40624	3.757926	170	8	0	4.35	SCT	4	2000	0	993.3333
2024	3	6	1	96.8	59	28.63	5.2539	2.348703	250	5	0	4.35	SCT	4	2000	18.8	993.3333
2024	3	6	2	96.8	57.2	26.84	8.40624	3.757926	190	8	0	4.35	SCT	4	2000	325.73	993.3333

2024	3	6	3	96.8	57.2	26.84	8.40624	3.757926	210	8	0	4.35	SCT	4	2000	866.03	993.3333
2024	3	6	4	96.8	57.2	26.84	6.30468	2.818444	200	6	0	4.35	SCT	4	2000	953.75	993.3333
2024	3	6	5	95	57.2	28.37	5.2539	2.348703	210	5	0	4.35	SCT	4	2000	985.05	1000
2024	3	6	6	80.6	73.4	78.76	4.20312	1.878963	180	4	0	3.11	SCT	4	2000	979.63	1001
2024	3	6	7	82.4	71.6	69.9	4.20312	1.878963	190	4	0	3.11	SCT	4	2000	969.79	1001
2024	3	6	8	84.2	69.8	62.03	4.20312	1.878963	180	4	0	3.11	SCT	4	2000	949.67	1000
2024	3	6	9	86	68	55.04	6.30468	2.818444	160	6	0	3.11	SCT	4	2000	901.22	999
2024	3	6	10	87.8	68	51.98	6.30468	2.818444	200	6	0	3.11	SCT	4	2000	807.23	998
2024	3	6	11	89.6	64.4	43.34	8.40624	3.757926	180	8	0	3.11	SCT	4	2000	627.99	998
2024	3	6	12	91.4	60.8	36.08	7.35546	3.288185	130	7	0	3.11	SCT	4	2000	357.27	997
2024	3	6	13	93.2	60.8	34.11	8.40624	3.757926	180	8	0	3.11	SCT	4	2000	0	996
2024	3	6	14	95	59	30.26	8.40624	3.757926	190	8	0	3.73	SCT	4	2000	0	995
2024	3	6	15	95	57.2	28.37	5.2539	2.348703	110	5	0	4.35	SCT	4	2000	0	995
2024	3	6	16	95	57.2	28.37	5.2539	2.348703	180	5	0	4.35	SCT	4	2000	0	995
2024	3	6	17	95	59	30.26	7.35546	3.288185	190	7	0	4.35	SCT	4	2000	0	995
2024	3	6	18	95	59	30.26	6.30468	2.818444	170	6	0	4.35	SCT	4	2000	0	995
2024	3	6	19	95	51.8	23.3	6.30468	2.818444	120	6	0	4.35	SCT	4	2000	0	996
2024	3	6	20	93.2	51.8	24.63	6.30468	2.818444	110	6	0	4.35	SCT	4	2000	0	1002
2024	3	6	21	80.6	64.4	57.84	2.10156	0.939481	180	2	0	3.11	SCT	4	2000	0	1002
2024	3	6	22	82.4	62.6	51.21	2.10156	0.939481	180	2	0	3.11	SCT	4	2000	0	1003
2024	3	6	23	82.4	60.8	48.05	2.10156	0.939481	180	2	0	3.11	SCT	4	2000	0	1002
2024	3	7	0	84.2	60.8	45.34	3.15234	1.409222	10	3	0	3.11	SCT	4	2000	0	1002
2024	3	7	1	86	60.8	42.8	2.10156	0.939481	180	2	0	3.11	SCT	4	2000	18.8	1002
2024	3	7	2	86	60.8	42.8	4.20312	1.878963	170	4	0	3.11	SCT	4	2000	325.73	1001
2024	3	7	3	89.6	57.2	33.56	4.20312	1.878963	70	4	0	3.11	SCT	4	2000	866.03	1000
2024	3	7	4	91.4	55.4	29.72	3.15234	1.409222	110	3	0	3.11	SCT	4	2000	953.75	1000
2024	3	7	5	91.4	55.4	29.72	6.30468	2.818444	190	6	0	3.11	SCT	4	2000	985.05	999
2024	3	7	6	93.2	55.4	28.1	6.30468	2.818444	240	6	0	3.11	SCT	4	2000	979.63	998
2024	3	7	7	95	53.6	24.89	4.20312	1.878963	260	4	0	3.11	SCT	4	2000	969.79	998
2024	3	7	8	95	53.6	24.89	4.20312	1.878963	110	4	0	3.73	SCT	4	2000	949.67	997
2024	3	7	9	95	51.8	23.3	4.20312	1.878963	140	4	0	3.73	SCT	4	2000	901.22	996
2024	3	7	10	96.8	51.8	22.04	5.2539	2.348703	170	5	0	3.73	SCT	4	2000	807.23	996

2024	3	7	11	96.8	51.8	22.04	7.35546	3.288185	90	7	0	4.35	SCT	4	2000	627.99	995
2024	3	7	12	96.8	53.6	23.55	10.5078	4.697407	100	10	0	4.35	SCT	4	2000	357.27	995
2024	3	7	13	95	53.6	24.89	10.5078	4.697407	100	10	0	4.35	SCT	4	2000	0	996
2024	3	7	14	93.2	55.4	28.1	10.5078	4.697407	110	10	0	4.35	SCT	4	2000	0	1001
2024	3	7	15	77	69.8	78.48	5.2539	2.348703	160	5	0	2.49	SCT	4	2000	0	1002
2024	3	7	16	80.6	64.4	57.84	4.20312	1.878963	110	4	0	3.11	SCT	4	2000	0	1002
2024	3	7	17	84.2	64.4	51.47	2.10156	0.939481	180	2	0	3.11	SCT	4	2000	0	1001
2024	3	7	18	86	62.6	45.61	5.2539	2.348703	150	5	0	3.11	SCT	4	2000	0	1001
2024	3	7	19	86	62.6	45.61	4.20312	1.878963	230	4	0	3.11	SCT	4	2000	0	1000
2024	3	7	20	89.6	57.2	33.56	5.2539	2.348703	180	5	0	3.11	SCT	4	2000	0	1000
2024	3	7	21	91.4	55.4	29.72	5.2539	2.348703	210	5	0	3.11	SCT	4	2000	0	999
2024	3	7	22	91.4	57.2	31.72	7.35546	3.288185	170	7	0	3.11	SCT	4	2000	0	998
2024	3	7	23	93.2	53.6	26.31	8.40624	3.757926	210	8	0	3.73	FEW	2	2000	0	998
2024	3	8	0	93.2	53.6	26.31	7.35546	3.288185	220	7	0	3.73	FEW	2	2000	0	997
2024	3	8	1	95	53.6	24.89	5.2539	2.348703	200	5	0	3.73	SCT	4	2000	18.8	996
2024	3	8	2	95	53.6	24.89	4.20312	1.878963	290	4	0	3.73	SCT	4	2000	325.73	996
2024	3	8	3	95	53.6	24.89	5.2539	2.348703	200	5	0	3.73	SCT	4	2000	866.03	995
2024	3	8	4	96.8	51.8	22.04	6.30468	2.818444	180	6	0	3.73	SCT	4	2000	953.75	995
2024	3	8	5	96.8	51.8	22.04	6.30468	2.818444	150	6	0	3.73	SCT	4	2000	985.05	995
2024	3	8	6	96.8	50	20.62	5.2539	2.348703	130	5	0	3.73	SCT	4	2000	979.63	995
2024	3	8	7	95	53.6	24.89	8.40624	3.757926	100	8	0	3.73	SCT	4	2000	969.79	1000
2024	3	8	8	80.6	68	65.54	3.15234	1.409222	140	3	0	3.11	SCT	4	2000	949.67	1000
2024	3	8	9	82.4	68	61.81	3.15234	1.409222	130	3	0	3.11	SCT	4	2000	901.22	1000
2024	3	8	10	87.8	57.2	35.53	6.30468	2.818444	170	6	0	3.11	SCT	4	2000	807.23	999
2024	3	8	11	89.6	50	25.79	6.30468	2.818444	160	6	0	3.11	SCT	4	2000	627.99	998
2024	3	8	12	91.4	50	24.37	7.35546	3.288185	200	7	0	3.11	SCT	4	2000	357.27	998
2024	3	8	13	91.4	50	24.37	6.30468	2.818444	190	6	0	3.73	SCT	4	2000	0	997
2024	3	8	14	93.2	51.8	24.63	6.30468	2.818444	220	6	0	3.73	SCT	4	2000	0	997
2024	3	8	15	95	53.6	24.89	8.40624	3.757926	200	8	0	3.73	FEW	2	2000	0	996
2024	3	8	16	95	53.6	24.89	5.2539	2.348703	140	5	0	3.73	SCT	4	2000	0	995
2024	3	8	17	95	53.6	24.89	2.10156	0.939481	180	2	0	3.73	SCT	4	2000	0	995
2024	3	8	18	95	53.6	24.89	8.40624	3.757926	190	8	0	3.73	SCT	4	2000	0	994.3333

2024	3	8	19	96.8	53.6	23.55	4.20312	1.878963	40	4	0	3.73	SCT	4	2000	0	994.3333
2024	3	8	20	96.8	53.6	23.55	5.2539	2.348703	180	5	0	3.73	SCT	4	2000	0	994.3333
2024	3	8	21	96.8	53.6	23.55	5.2539	2.348703	230	5	0	3.73	SCT	4	2000	0	994.3333
2024	3	8	22	95	53.6	24.89	2.10156	0.939481	210	2	0	3.73	SCT	4	2000	0	999
2024	3	8	23	80.6	66.2	61.58	4.20312	1.878963	120	4	0	3.11	SCT	4	2000	0	1000
2024	3	9	0	84.2	69.8	62.03	5.2539	2.348703	190	5	0	3.11	SCT	4	2000	0	1000
2024	3	9	1	84.2	69.8	62.03	2.10156	0.939481	210	2	0	3.11	SCT	4	2000	18.8	999
2024	3	9	2	87.8	69.8	55.29	2.10156	0.939481	210	2	0	3.11	SCT	4	2000	325.73	999
2024	3	9	3	87.8	69.8	55.29	3.15234	1.409222	180	3	0	3.11	SCT	4	2000	866.03	998
2024	3	9	4	89.6	68	49.1	3.15234	1.409222	170	3	0	3.11	SCT	4	2000	953.75	998
2024	3	9	5	91.4	64.4	40.96	3.15234	1.409222	180	3	0	3.11	SCT	4	2000	985.05	997
2024	3	9	6	95	59	30.26	4.20312	1.878963	280	4	0	3.11	FEW	2	2000	979.63	996
2024	3	9	7	95	55.4	26.58	4.20312	1.878963	120	4	0	3.11	SCT	4	2000	969.79	996
2024	3	9	8	95	55.4	26.58	6.30468	2.818444	150	6	0	3.11	SCT	4	2000	949.67	995
2024	3	9	9	96.8	55.4	25.15	4.20312	1.878963	220	4	0	3.11	SCT	4	2000	901.22	994.3333
2024	3	9	10	96.8	55.4	25.15	5.2539	2.348703	180	5	0	3.11	SCT	4	2000	807.23	994.3333
2024	3	9	11	96.8	57.2	26.84	6.30468	2.818444	150	6	0	3.73	SCT	4	2000	627.99	993.3333
2024	3	9	12	98.6	55.4	23.81	5.2539	2.348703	90	5	0	3.73	SCT	4	2000	357.27	993.3333
2024	3	9	13	98.6	57.2	25.41	4.20312	1.878963	320	4	0	3.73	SCT	4	2000	0	993.3333
2024	3	9	14	98.6	57.2	25.41	7.35546	3.288185	180	7	0	3.73	SCT	4	2000	0	993.3333
2024	3	9	15	98.6	57.2	25.41	4.20312	1.878963	130	4	0	3.73	SCT	4	2000	0	993.3333
2024	3	9	16	96.8	57.2	26.84	5.2539	2.348703	150	5	0	3.73	SCT	4	2000	0	998
2024	3	9	17	80.6	69.8	69.71	3.15234	1.409222	140	3	0	3.11	SCT	4	2000	0	999
2024	3	9	18	82.4	68	61.81	6.30468	2.818444	170	6	0	3.11	SCT	4	2000	0	998
2024	3	9	19	86	68	55.04	6.30468	2.818444	190	6	0	3.11	SCT	4	2000	0	997
2024	3	9	20	87.8	68	51.98	5.2539	2.348703	70	5	0	3.11	SCT	4	2000	0	997
2024	3	9	21	91.4	68	46.41	4.20312	1.878963	90	4	0	3.11	SCT	4	2000	0	996
2024	3	9	22	91.4	66.2	43.61	5.2539	2.348703	170	5	0	3.11	SCT	4	2000	0	995
2024	3	9	23	93.2	66.2	41.23	3.15234	1.409222	130	3	0	3.11	SCT	4	2000	0	994.3333
2024	3	10	0	95	64.4	36.63	5.2539	2.348703	260	5	0	3.11	SCT	4	2000	0	993.3333
2024	3	10	1	96.8	60.8	30.53	8.40624	3.757926	160	8	0	3.73	SCT	4	2000	18.8	992.3333
2024	3	10	2	96.8	60.8	30.53	5.2539	2.348703	190	5	0	3.73	SCT	4	2000	325.73	992.3333

2024	3	10	3	96.8	60.8	30.53	6.30468	2.818444	260	6	0	3.73	SCT	4	2000	866.03	993.3333
2024	3	10	4	96.8	62.6	32.54	7.35546	3.288185	190	7	0	3.73	SCT	4	2000	953.75	999
2024	3	10	5	80.6	69.8	69.71	3.15234	1.409222	350	3	0	3.11	SCT	4	2000	985.05	999
2024	3	10	6	82.4	69.8	65.74	3.15234	1.409222	180	3	0	3.11	SCT	4	2000	979.63	1000
2024	3	10	7	86	66.2	51.72	4.20312	1.878963	160	4	0	3.11	SCT	4	2000	969.79	999
2024	3	10	8	86	66.2	51.72	5.2539	2.348703	170	5	0	3.11	SCT	4	2000	949.67	999
2024	3	10	9	87.8	66.2	48.84	6.30468	2.818444	130	6	0	3.73	SCT	4	2000	901.22	998
2024	3	10	10	87.8	64.4	45.88	5.2539	2.348703	90	5	0	3.73	SCT	4	2000	807.23	997
2024	3	10	11	89.6	64.4	43.34	7.35546	3.288185	170	7	0	3.73	SCT	4	2000	627.99	996
2024	3	10	12	91.4	64.4	40.96	6.30468	2.818444	170	6	0	3.73	SCT	4	2000	357.27	996
2024	3	10	13	91.4	60.8	36.08	5.2539	2.348703	150	5	0	3.73	SCT	4	2000	0	995
2024	3	10	14	93.2	60.8	34.11	6.30468	2.818444	170	6	0	3.73	SCT	4	2000	0	995
2024	3	10	15	95	62.6	34.39	6.30468	2.818444	170	6	0	3.73	SCT	4	2000	0	994.3333
2024	3	10	16	95	62.6	34.39	7.35546	3.288185	190	7	0	4.35	SCT	4	2000	0	994.3333
2024	3	10	17	95	60.8	32.27	7.35546	3.288185	190	7	0	4.35	SCT	4	2000	0	993.3333
2024	3	10	18	96.8	60.8	30.53	8.40624	3.757926	180	8	0	4.35	SCT	4	2000	0	993.3333
2024	3	10	19	96.8	60.8	30.53	5.2539	2.348703	170	5	0	4.35	SCT	4	2000	0	993.3333
2024	3	10	20	96.8	59	28.63	8.40624	3.757926	150	8	0	4.35	SCT	4	2000	0	993.3333
2024	3	10	21	96.8	53.6	23.55	8.40624	3.757926	110	8	0	4.35	SCT	4	2000	0	994.3333
2024	3	10	22	95	53.6	24.89	8.40624	3.757926	110	8	0	4.35	SCT	4	2000	0	999
2024	3	10	23	80.6	71.6	74.11	5.2539	2.348703	30	5	0	3.11	SCT	4	2000	0	999
2024	3	11	0	82.4	69.8	65.74	2.10156	0.939481	210	2	0	3.11	SCT	4	2000	0	999
2024	3	11	1	84.2	68	58.32	6.30468	2.818444	120	6	0	3.11	SCT	4	2000	18.8	998
2024	3	11	2	87.8	66.2	48.84	6.30468	2.818444	170	6	0	3.73	SCT	4	2000	325.73	998
2024	3	11	3	89.6	64.4	43.34	6.30468	2.818444	180	6	0	4.35	SCT	4	2000	866.03	997
2024	3	11	4	91.4	62.6	38.45	8.40624	3.757926	160	8	0	4.35	SCT	4	2000	953.75	996
2024	3	11	5	91.4	60.8	36.08	9.45702	4.227666	130	9	0	4.97	SCT	4	2000	985.05	996
2024	3	11	6	93.2	59	31.99	6.30468	2.818444	140	6	0	4.97	SCT	4	2000	979.63	995
2024	3	11	7	95	51.8	23.3	9.45702	4.227666	150	9	0	4.97	SCT	4	2000	969.79	994.3333
2024	3	11	8	95	50	21.79	8.40624	3.757926	150	8	0	4.97	SCT	4	2000	949.67	994.3333
2024	3	11	9	96.8	46.4	18.02	9.45702	4.227666	120	9	0	4.97	SCT	4	2000	901.22	994.3333
2024	3	11	10	96.8	42.8	15.71	9.45702	4.227666	130	9	0	4.97	SCT	4	2000	807.23	994.3333

2024	3	11	11	95	50	21.79	7.35546	3.288185	120	7	0	4.97	SCT	4	1800	627.99	994.3333
2024	3	11	12	95	48.2	20.38	10.5078	4.697407	120	10	0	4.97	SCT	4	1800	357.27	994.3333
2024	3	11	13	93.2	48.2	21.54	9.45702	4.227666	120	9	0	4.97	SCT	4	2000	0	999
2024	3	11	14	78.8	69.8	73.95	3.15234	1.409222	250	3	0	3.11	SCT	4	2000	0	1000
2024	3	11	15	82.4	69.8	65.74	3.15234	1.409222	40	3	0	3.11	SCT	4	2000	0	1000
2024	3	11	16	82.4	69.8	65.74	3.15234	1.409222	250	3	0	3.11	SCT	4	2000	0	999
2024	3	11	17	84.2	69.8	62.03	3.15234	1.409222	220	3	0	3.11	SCT	4	2000	0	999
2024	3	11	18	86	68	55.04	3.15234	1.409222	120	3	0	3.11	SCT	4	2000	0	999
2024	3	11	19	87.8	66.2	48.84	3.15234	1.409222	240	3	0	3.11	SCT	4	2000	0	998
2024	3	11	20	87.8	64.4	45.88	4.20312	1.878963	80	4	0	3.11	SCT	4	2000	0	997
2024	3	11	21	89.6	60.8	38.18	3.15234	1.409222	280	3	0	3.11	SCT	4	2000	0	996
2024	3	11	22	91.4	57.2	31.72	3.15234	1.409222	210	3	0	3.73	SCT	4	2000	0	995
2024	3	11	23	93.2	55.4	28.1	6.30468	2.818444	180	6	0	3.73	SCT	4	2000	0	994.3333
2024	3	12	0	95	57.2	28.37	8.40624	3.757926	200	8	0	3.73	SCT	4	2000	0	994.3333
2024	3	12	1	95	55.4	26.58	7.35546	3.288185	180	7	0	3.73	SCT	4	2000	18.8	994.3333
2024	3	12	2	95	48.2	20.38	6.30468	2.818444	120	6	0	3.73	SCT	4	2000	325.73	993.3333
2024	3	12	3	96.8	50	20.62	6.30468	2.818444	130	6	0	3.73	SCT	4	2000	866.03	993.3333
2024	3	12	4	96.8	50	20.62	4.20312	1.878963	170	4	0	3.73	SCT	4	2000	953.75	993.3333
2024	3	12	5	96.8	48.2	19.28	7.35546	3.288185	140	7	0	3.73	SCT	4	2000	985.05	993.3333
2024	3	12	6	93.2	50	23.04	9.45702	4.227666	110	9	0	3.73	SCT	4	2000	979.63	996
2024	3	12	7	69.8	60.8	73.09	4.20312	1.878963	30	4	0	3.11	SCT	4	2000	969.79	997
2024	3	12	8	69.8	60.8	73.09	5.2539	2.348703	20	5	0	3.11	SCT	4	2000	949.67	997
2024	3	12	9	69.8	62.6	77.9	3.15234	1.409222	300	3	0	3.11	SCT	4	1800	901.22	998
2024	3	12	10	71.6	62.6	73.27	3.15234	1.409222	340	3	0	3.11	SCT	4	1800	807.23	998
2024	3	12	11	75.2	66.2	73.61	3.15234	1.409222	310	3	0	3.11	SCT	4	1800	627.99	998
2024	3	12	12	80.6	66.2	61.58	3.15234	1.409222	300	3	0	3.11	SCT	4	1800	357.27	998
2024	3	12	13	82.4	66.2	58.08	3.15234	1.409222	310	3	0	3.11	SCT	4	1800	0	999
2024	3	12	14	82.4	66.2	58.08	4.20312	1.878963	150	4	0	3.11	SCT	4	1800	0	998
2024	3	12	15	82.4	64.4	54.55	4.20312	1.878963	180	4	0	3.11	SCT	4	1800	0	998
2024	3	12	16	86	62.6	45.61	4.20312	1.878963	220	4	0	3.11	SCT	4	2000	0	998
2024	3	12	17	87.8	51.8	29.18	3.15234	1.409222	100	3	0	3.11	SCT	4	2000	0	997
2024	3	12	18	89.6	57.2	33.56	5.2539	2.348703	220	5	0	3.11	SCT	4	2000	0	996

2024	3	12	19	89.6	53.6	29.45	8.40624	3.757926	180	8	0	3.73	SCT	4	2000	0	996
2024	3	12	20	93.2	48.2	21.54	8.40624	3.757926	180	8	0	3.73	SCT	4	2000	0	995
2024	3	12	21	93.2	50	23.04	6.30468	2.818444	140	6	0	3.73	SCT	4	2000	0	995
2024	3	12	22	95	42.8	16.6	7.35546	3.288185	120	7	0	4.35	SCT	4	2000	0	994.3333
2024	3	12	23	95	44.6	17.78	6.30468	2.818444	120	6	0	4.35	SCT	4	2000	0	993.3333
2024	3	13	0	96.8	44.6	16.83	5.2539	2.348703	130	5	0	4.35	SCT	4	2000	0	993.3333
2024	3	13	1	98.6	44.6	15.93	6.30468	2.818444	110	6	0	4.35	SCT	4	2000	18.8	993.3333
2024	3	13	2	96.8	44.6	16.83	5.2539	2.348703	160	5	0	4.35	SCT	4	2000	325.73	993.3333
2024	3	13	3	96.8	44.6	16.83	5.2539	2.348703	140	5	0	4.35	SCT	4	2000	866.03	993.3333
2024	3	13	4	96.8	44.6	16.83	8.40624	3.757926	150	8	0	4.35	SCT	4	2000	953.75	993.3333
2024	3	13	5	95	46.4	19.04	7.35546	3.288185	100	7	0	4.35	SCT	4	2000	985.05	993.3333
2024	3	13	6	95	46.4	19.04	7.35546	3.288185	100	7	0	4.35	SCT	4	2000	979.63	993.3333
2024	3	13	7	95	50	21.79	8.40624	3.757926	90	8	0	4.35	SCT	4	2000	969.79	998
2024	3	13	8	77	69.8	78.48	3.15234	1.409222	10	3	0	3.11	SCT	4	1800	949.67	999
2024	3	13	9	82.4	68	61.81	4.20312	1.878963	100	4	0	3.11	SCT	4	2000	901.22	998
2024	3	13	10	82.4	62.6	51.21	3.15234	1.409222	290	3	0	3.11	SCT	4	2000	807.23	998
2024	3	13	11	86	57.2	37.62	3.15234	1.409222	100	3	0	3.11	SCT	4	2000	627.99	998
2024	3	13	12	86	59	40.14	3.15234	1.409222	180	3	0	3.11	SCT	4	2000	357.27	997
2024	3	13	13	87.8	55.4	33.29	6.30468	2.818444	130	6	0	3.11	SCT	4	2000	0	996
2024	3	13	14	89.6	57.2	33.56	4.20312	1.878963	190	4	0	3.11	SCT	4	2000	0	996
2024	3	13	15	91.4	53.6	27.83	4.20312	1.878963	160	4	0	3.11	SCT	4	2000	0	995
2024	3	13	16	93.2	51.8	24.63	8.40624	3.757926	200	8	0	3.73	SCT	4	2000	0	994.3333
2024	3	13	17	93.2	53.6	26.31	6.30468	2.818444	200	6	0	3.73	SCT	4	2000	0	993.3333
2024	3	13	18	95	51.8	23.3	4.20312	1.878963	150	4	0	3.73	SCT	4	2000	0	992.3333
2024	3	13	19	96.8	51.8	22.04	3.15234	1.409222	250	3	0	3.73	SCT	4	2000	0	992.3333
2024	3	13	20	96.8	51.8	22.04	7.35546	3.288185	190	7	0	3.73	SCT	4	2000	0	992.3333
2024	3	13	21	95	51.8	23.3	6.30468	2.818444	110	6	0	3.73	SCT	4	2000	0	999
2024	3	13	22	80.6	68	65.54	3.15234	1.409222	80	3	0	3.11	SCT	4	2000	0	999
2024	3	13	23	82.4	66.2	58.08	2.10156	0.939481	210	2	0	3.11	SCT	4	2000	0	999
2024	3	14	0	86	64.4	48.58	2.10156	0.939481	210	2	0	3.11	SCT	4	2000	0	998
2024	3	14	1	86	64.4	48.58	2.10156	0.939481	210	2	0	3.11	SCT	4	2000	18.8	998
2024	3	14	2	87.8	64.4	45.88	3.15234	1.409222	10	3	0	3.11	SCT	4	2000	325.73	997

2024	3	14	3	87.8	62.6	43.07	6.30468	2.818444	10	6	0	3.11	SCT	4	2000	866.03	996
2024	3	14	4	89.6	60.8	38.18	3.15234	1.409222	30	3	0	3.73	SCT	4	2000	953.75	996
2024	3	14	5	91.4	62.6	38.45	4.20312	1.878963	240	4	0	3.73	SCT	4	2000	985.05	995
2024	3	14	6	91.4	60.8	36.08	2.10156	0.939481	210	2	0	3.73	SCT	4	2000	979.63	995
2024	3	14	7	93.2	60.8	34.11	8.40624	3.757926	150	8	0	3.73	SCT	4	2000	969.79	994.3333
2024	3	14	8	93.2	60.8	34.11	3.15234	1.409222	120	3	0	4.35	SCT	4	2000	949.67	993.3333
2024	3	14	9	95	60.8	32.27	4.20312	1.878963	170	4	0	4.35	SCT	4	2000	901.22	993.3333
2024	3	14	10	93.2	60.8	34.11	5.2539	2.348703	140	5	0	4.35	SCT	4	2000	807.23	993.3333
2024	3	14	11	93.2	60.8	34.11	5.2539	2.348703	160	5	0	4.35	SCT	4	2000	627.99	992.3333
2024	3	14	12	93.2	62.6	36.35	4.20312	1.878963	160	4	0	4.35	SCT	4	2000	357.27	992.3333
2024	3	14	13	93.2	60.8	34.11	4.20312	1.878963	100	4	0	4.97	SCT	4	2000	0	997
2024	3	14	14	80.6	69.8	69.71	3.15234	1.409222	170	3	0	3.11	SCT	4	2000	0	997
2024	3	14	15	82.4	69.8	65.74	3.15234	1.409222	160	3	0	3.11	SCT	4	2000	0	997
2024	3	14	16	86	69.8	58.55	4.20312	1.878963	260	4	0	3.11	SCT	4	2000	0	996
2024	3	14	17	87.8	68	51.98	4.20312	1.878963	130	4	0	3.11	SCT	4	2000	0	995
2024	3	14	18	87.8	68	51.98	4.20312	1.878963	120	4	0	3.11	SCT	4	2000	0	994.3333
2024	3	14	19	89.6	68	49.1	4.20312	1.878963	210	4	0	3.11	SCT	4	2000	0	994.3333
2024	3	14	20	91.4	66.2	43.61	5.2539	2.348703	130	5	0	3.11	SCT	4	2000	0	993.3333
2024	3	14	21	93.2	66.2	41.23	3.15234	1.409222	160	3	0	3.73	SCT	4	2000	0	992.3333
2024	3	14	22	95	60.8	32.27	5.2539	2.348703	190	5	0	3.73	SCT	4	2000	0	991.3333
2024	3	14	23	96.8	59	28.63	4.20312	1.878963	100	4	0	4.35	SCT	4	2000	0	990.3333
2024	3	15	0	95	53.6	24.89	4.20312	1.878963	340	4	0	4.35	SCT	4	2000	0	991.3333
2024	3	15	1	95	60.8	32.27	4.20312	1.878963	100	4	0	4.35	SCT	4	2000	18.8	997
2024	3	15	2	82.4	71.6	69.9	3.15234	1.409222	300	3	0	3.11	SCT	4	2000	325.73	997
2024	3	15	3	82.4	71.6	69.9	2.10156	0.939481	210	2	0	3.11	SCT	4	2000	866.03	997
2024	3	15	4	84.2	71.6	65.95	3.15234	1.409222	130	3	0	3.11	SCT	4	2000	953.75	997
2024	3	15	5	86	69.8	58.55	3.15234	1.409222	150	3	0	3.11	SCT	4	2000	985.05	996
2024	3	15	6	87.8	66.2	48.84	2.10156	0.939481	210	2	0	3.11	SCT	4	2000	979.63	996
2024	3	15	7	87.8	68	51.98	4.20312	1.878963	170	4	0	3.11	SCT	4	2000	969.79	995
2024	3	15	8	89.6	66.2	46.14	3.15234	1.409222	70	3	0	3.11	SCT	4	2000	949.67	995
2024	3	15	9	91.4	64.4	40.96	4.20312	1.878963	150	4	0	3.11	SCT	4	1800	901.22	994.3333
2024	3	15	10	93.2	62.6	36.35	4.20312	1.878963	160	4	0	3.11	SCT	4	1800	807.23	993.3333

2024	3	15	11	95	60.8	32.27	4.20312	1.878963	190	4	0	3.11	SCT	4	1800	627.99	992.3333
2024	3	15	12	96.8	59	28.63	4.20312	1.878963	140	4	0	3.11	SCT	4	1800	357.27	992.3333
2024	3	15	13	96.8	55.4	25.15	4.20312	1.878963	190	4	0	3.73	FEW	2	1000	0	991.3333
2024	3	15	14	96.8	57.2	26.84	5.2539	2.348703	170	5	0	3.73	FEW	2	1000	0	991.3333
2024	3	15	15	96.8	57.2	26.84	7.35546	3.288185	150	7	0	3.73	FEW	2	1000	0	991.3333
2024	3	15	16	98.6	55.4	23.81	7.35546	3.288185	130	7	0	3.73	FEW	2	1000	0	991.3333
2024	3	15	17	96.8	50	20.62	5.2539	2.348703	130	5	0	3.73	FEW	2	1000	0	991.3333
2024	3	15	18	96.8	48.2	19.28	8.40624	3.757926	180	8	0	3.73	SCT	4	2000	0	991.3333
2024	3	15	19	96.8	51.8	22.04	7.35546	3.288185	40	7	0	3.73	SCT	4	2000	0	998
2024	3	15	20	78.8	68	69.52	3.15234	1.409222	10	3	0	3.11	SCT	4	2000	0	999
2024	3	15	21	80.6	68	65.54	3.15234	1.409222	220	3	0	3.11	SCT	4	2000	0	999
2024	3	15	22	86	60.8	42.8	3.15234	1.409222	170	3	0	3.11	FEW	2	1500	0	998
2024	3	15	23	87.8	57.2	35.53	4.20312	1.878963	190	4	0	3.11	FEW	2	1500	0	997
2024	3	16	0	91.4	57.2	31.72	3.15234	1.409222	240	3	0	3.11	FEW	2	1500	0	997
2024	3	16	1	91.4	57.2	31.72	3.15234	1.409222	180	3	0	3.11	FEW	2	1500	18.8	996
2024	3	16	2	91.4	57.2	31.72	5.2539	2.348703	150	5	0	3.11	SCT	4	2000	325.73	995
2024	3	16	3	93.2	53.6	26.31	4.20312	1.878963	220	4	0	3.11	SCT	4	2000	866.03	994.3333
2024	3	16	4	95	50	21.79	4.20312	1.878963	190	4	0	3.73	SCT	4	2000	953.75	993.3333
2024	3	16	5	98.6	44.6	15.93	7.35546	3.288185	100	7	0	4.35	SCT	4	2000	985.05	993.3333
2024	3	16	6	96.8	44.6	16.83	6.30468	2.818444	160	6	0	4.35	SCT	4	2000	979.63	993.3333
2024	3	16	7	96.8	48.2	19.28	8.40624	3.757926	110	8	0	4.35	FEW	2	1500	969.79	993.3333
2024	3	16	8	96.8	48.2	19.28	7.35546	3.288185	130	7	0	4.35	FEW	2	1500	949.67	994.3333
2024	3	16	9	95	50	21.79	6.30468	2.818444	120	6	0	4.35	FEW	2	1500	901.22	994.3333
2024	3	16	10	95	51.8	23.3	6.30468	2.818444	130	6	0	4.35	FEW	2	1500	807.23	999
2024	3	16	11	77	69.8	78.48	3.15234	1.409222	160	3	0	3.11	FEW	2	1500	627.99	999
2024	3	16	12	77	69.8	78.48	3.15234	1.409222	160	3	0	3.11	FEW	2	1500	357.27	999
2024	3	16	13	82.4	69.8	65.74	3.15234	1.409222	120	3	0	3.11	SCT	4	2000	0	998
2024	3	16	14	82.4	68	61.81	4.20312	1.878963	150	4	0	3.11	SCT	4	2000	0	998
2024	3	16	15	86	64.4	48.58	3.15234	1.409222	20	3	0	3.11	SCT	4	2000	0	998
2024	3	16	16	87.8	64.4	45.88	3.15234	1.409222	300	3	0	3.11	SCT	4	2000	0	997
2024	3	16	17	89.6	60.8	38.18	3.15234	1.409222	80	3	0	3.11	SCT	4	2000	0	996
2024	3	16	18	91.4	59	33.84	4.20312	1.878963	310	4	0	3.11	SCT	4	2000	0	996

2024	3	16	19	93.2	51.8	24.63	3.15234	1.409222	270	3	0	3.11	SCT	4	2000	0	995
2024	3	16	20	95	50	21.79	3.15234	1.409222	130	3	0	3.11	SCT	4	2000	0	994.3333
2024	3	16	21	96.8	50	20.62	5.2539	2.348703	180	5	0	3.73	SCT	4	2000	0	993.3333
2024	3	16	22	96.8	51.8	22.04	6.30468	2.818444	180	6	0	3.73	SCT	4	2000	0	993.3333
2024	3	16	23	96.8	53.6	23.55	6.30468	2.818444	170	6	0	3.73	SCT	4	2000	0	993.3333
2024	3	17	0	96.8	55.4	25.15	8.40624	3.757926	130	8	0	3.73	SCT	4	2000	0	993.3333
2024	3	17	1	95	57.2	28.37	8.40624	3.757926	110	8	0	3.73	SCT	4	2000	18.8	993.3333
2024	3	17	2	95	57.2	28.37	8.40624	3.757926	120	8	0	3.73	SCT	4	2000	325.73	999
2024	3	17	3	78.8	66.2	65.33	3.15234	1.409222	210	3	0	3.11	SCT	4	2000	866.03	999
2024	3	17	4	80.6	66.2	61.58	3.15234	1.409222	80	3	0	3.11	SCT	4	2000	953.75	999
2024	3	17	5	82.4	64.4	54.55	6.30468	2.818444	150	6	0	3.11	SCT	4	2000	985.05	999
2024	3	17	6	86	64.4	48.58	3.15234	1.409222	200	3	0	3.11	SCT	4	2000	979.63	998
2024	3	17	7	86	62.6	45.61	4.20312	1.878963	270	4	0	3.11	SCT	4	2000	969.79	998
2024	3	17	8	87.8	60.8	40.41	3.15234	1.409222	120	3	0	3.11	SCT	4	2000	949.67	997
2024	3	17	9	89.6	60.8	38.18	4.20312	1.878963	280	4	0	3.11	SCT	4	2000	901.22	997
2024	3	17	10	93.2	59	31.99	3.15234	1.409222	40	3	0	3.11	SCT	4	2000	807.23	996
2024	3	17	11	93.2	57.2	29.99	3.15234	1.409222	40	3	0	3.11	SCT	4	2000	627.99	995
2024	3	17	12	95	55.4	26.58	5.2539	2.348703	170	5	0	3.73	SCT	4	2000	357.27	995
2024	3	17	13	95	51.8	23.3	4.20312	1.878963	80	4	0	3.73	SCT	4	2000	0	994.3333
2024	3	17	14	96.8	50	20.62	4.20312	1.878963	100	4	0	3.73	FEW	2	2000	0	994.3333
2024	3	17	15	96.8	51.8	22.04	6.30468	2.818444	170	6	0	3.73	SCT	4	2000	0	994.3333
2024	3	17	16	96.8	50	20.62	3.15234	1.409222	160	3	0	3.73	SCT	4	2000	0	993.3333
2024	3	17	17	98.6	51.8	20.87	8.40624	3.757926	180	8	0	3.73	SCT	4	2000	0	993.3333
2024	3	17	18	96.8	53.6	23.55	7.35546	3.288185	100	7	0	3.73	SCT	4	2000	0	994.3333
2024	3	17	19	95	53.6	24.89	7.35546	3.288185	110	7	0	3.73	SCT	4	2000	0	1001
2024	3	17	20	78.8	64.4	61.36	4.20312	1.878963	130	4	0	3.11	SCT	4	2000	0	1002
2024	3	17	21	82.4	62.6	51.21	4.20312	1.878963	120	4	0	3.11	FEW	2	2000	0	1001
2024	3	17	22	86	60.8	42.8	4.20312	1.878963	330	4	0	3.11	FEW	2	2000	0	1000
2024	3	17	23	87.8	55.4	33.29	5.2539	2.348703	80	5	0	3.73	FEW	2	2000	0	999
2024	3	18	0	91.4	46.4	21.29	4.20312	1.878963	140	4	0	4.35	FEW	2	2000	0	999
2024	3	18	1	91.4	41	17.32	4.20312	1.878963	220	4	0	4.97	FEW	2	2000	18.8	998
2024	3	18	2	91.4	41	17.32	4.20312	1.878963	210	4	0	4.97	FEW	2	2000	325.73	997

2024	3	18	3	95	41	15.49	4.20312	1.878963	40	4	0	4.97	FEW	2	2000	866.03	996
2024	3	18	4	96.8	39.2	13.66	5.2539	2.348703	160	5	0	4.97	FEW	2	2000	953.75	995
2024	3	18	5	96.8	35.6	11.86	6.30468	2.818444	130	6	0	4.97	FEW	2	2000	985.05	995
2024	3	18	6	96.8	50	20.62	8.40624	3.757926	150	8	0	4.97	FEW	2	2000	979.63	995
2024	3	18	7	95	53.6	24.89	8.40624	3.757926	120	8	0	4.97	FEW	2	2000	969.79	999
2024	3	18	8	80.6	75.2	83.66	4.20312	1.878963	130	4	0	3.11	FEW	2	2000	949.67	1000
2024	3	18	9	82.4	73.4	74.28	3.15234	1.409222	190	3	0	3.11	FEW	2	2000	901.22	999
2024	3	18	10	84.2	71.6	65.95	3.15234	1.409222	170	3	0	3.11	FEW	2	2000	807.23	999
2024	3	18	11	86	69.8	58.55	3.15234	1.409222	210	3	0	3.11	FEW	2	2000	627.99	998
2024	3	18	12	87.8	71.6	58.78	3.15234	1.409222	240	3	0	3.11	FEW	2	2000	357.27	998
2024	3	18	13	89.6	69.8	52.23	3.15234	1.409222	200	3	0	3.11	SCT	4	2000	0	997
2024	3	18	14	91.4	68	46.41	5.2539	2.348703	210	5	0	3.11	SCT	4	2000	0	996
2024	3	18	15	91.4	68	46.41	3.15234	1.409222	190	3	0	3.11	SCT	4	2000	0	996
2024	3	18	16	91.4	66.2	43.61	3.15234	1.409222	140	3	0	3.73	SCT	4	2000	0	995
2024	3	18	17	95	60.8	32.27	5.2539	2.348703	210	5	0	3.73	SCT	4	2000	0	995
2024	3	18	18	95	60.8	32.27	6.30468	2.818444	110	6	0	3.73	SCT	4	2000	0	994.3333
2024	3	18	19	96.8	59	28.63	5.2539	2.348703	190	5	0	3.73	SCT	4	2000	0	994.3333
2024	3	18	20	96.8	59	28.63	4.20312	1.878963	110	4	0	4.35	FEW	2	2000	0	993.3333
2024	3	18	21	98.6	59	27.1	3.15234	1.409222	130	3	0	4.35	FEW	2	2000	0	993.3333
2024	3	18	22	98.6	57.2	25.41	3.15234	1.409222	280	3	0	4.35	FEW	2	2000	0	993.3333
2024	3	18	23	98.6	57.2	25.41	3.15234	1.409222	120	3	0	4.35	SCT	4	2000	0	993.3333
2024	3	19	0	96.8	60.8	30.53	5.2539	2.348703	120	5	0	4.35	SCT	4	2000	0	998
2024	3	19	1	80.6	71.6	74.11	3.15234	1.409222	130	3	0	3.11	SCT	4	2000	18.8	998
2024	3	19	2	86	68	55.04	5.2539	2.348703	170	5	0	3.11	SCT	4	2000	325.73	998
2024	3	19	3	86	66.2	51.72	6.30468	2.818444	180	6	0	3.73	SCT	4	2000	866.03	998
2024	3	19	4	87.8	69.8	55.29	7.35546	3.288185	210	7	0	3.73	SCT	4	2000	953.75	998
2024	3	19	5	87.8	69.8	55.29	6.30468	2.818444	180	6	0	3.73	SCT	4	2000	985.05	997
2024	3	19	6	89.6	68	49.1	5.2539	2.348703	200	5	0	3.73	SCT	4	2000	979.63	997
2024	3	19	7	91.4	66.2	43.61	5.2539	2.348703	280	5	0	3.73	SCT	4	2000	969.79	996
2024	3	19	8	93.2	62.6	36.35	4.20312	1.878963	120	4	0	4.35	SCT	4	2000	949.67	996
2024	3	19	9	95	59	30.26	6.30468	2.818444	220	6	0	4.35	SCT	4	2000	901.22	995
2024	3	19	10	95	60.8	32.27	7.35546	3.288185	140	7	0	4.35	SCT	4	2000	807.23	993.3333

2024	3	19	11	96.8	59	28.63	6.30468	2.818444	180	6	0	4.35	SCT	4	2000	627.99	993.3333
2024	3	19	12	96.8	60.8	30.53	5.2539	2.348703	160	5	0	4.35	SCT	4	2000	357.27	992.3333
2024	3	19	13	96.8	59	28.63	6.30468	2.818444	200	6	0	4.35	SCT	4	2000	0	993.3333
2024	3	19	14	96.8	59	28.63	5.2539	2.348703	110	5	0	4.35	SCT	4	2000	0	993.3333
2024	3	19	15	96.8	59	28.63	8.40624	3.757926	180	8	0	4.35	SCT	4	2000	0	993.3333
2024	3	19	16	95	55.4	26.58	6.30468	2.818444	190	6	0	4.35	SCT	4	2000	0	999
2024	3	19	17	82.4	69.8	65.74	3.15234	1.409222	250	3	0	3.11	SCT	4	2000	0	999
2024	3	19	18	87.8	68	51.98	3.15234	1.409222	250	3	0	3.11	SCT	4	2000	0	999
2024	3	19	19	87.8	68	51.98	3.15234	1.409222	250	3	0	3.11	SCT	4	2000	0	999
2024	3	19	20	89.6	66.2	46.14	2.10156	0.939481	210	2	0	3.11	SCT	4	2000	0	998
2024	3	19	21	89.6	66.2	46.14	3.15234	1.409222	250	3	0	3.11	SCT	4	2000	0	998
2024	3	19	22	91.4	64.4	40.96	3.15234	1.409222	250	3	0	3.11	SCT	4	2000	0	997
2024	3	19	23	93.2	62.6	36.35	2.10156	0.939481	210	2	0	3.11	SCT	4	2000	0	997
2024	3	20	0	93.2	62.6	36.35	3.15234	1.409222	130	3	0	3.11	SCT	4	2000	0	996
2024	3	20	1	95	60.8	32.27	5.2539	2.348703	180	5	0	3.11	SCT	4	2000	18.8	995
2024	3	20	2	95	59	30.26	4.20312	1.878963	120	4	0	3.73	SCT	4	2000	325.73	995
2024	3	20	3	95	59	30.26	6.30468	2.818444	210	6	0	3.73	SCT	4	2000	866.03	994.3333
2024	3	20	4	96.8	57.2	26.84	4.20312	1.878963	280	4	0	3.73	SCT	4	2000	953.75	994.3333
2024	3	20	5	96.8	55.4	25.15	6.30468	2.818444	110	6	0	3.73	SCT	4	2000	985.05	993.3333
2024	3	20	6	98.6	53.6	22.29	4.20312	1.878963	120	4	0	3.73	SCT	4	2000	979.63	993.3333
2024	3	20	7	100.4	53.6	21.11	2.10156	0.939481	210	2	0	4.35	SCT	4	2000	969.79	993.3333
2024	3	20	8	98.6	51.8	20.87	4.20312	1.878963	200	4	0	4.97	SCT	4	2000	949.67	993.3333
2024	3	20	9	98.6	51.8	20.87	8.40624	3.757926	110	8	0	4.97	SCT	4	2000	901.22	994.3333
2024	3	20	10	96.8	51.8	22.04	10.5078	4.697407	110	10	0	4.97	SCT	4	2000	807.23	1001
2024	3	20	11	82.4	62.6	51.21	4.20312	1.878963	120	4	0	3.11	SCT	4	2000	627.99	1001
2024	3	20	12	84.2	64.4	51.47	2.10156	0.939481	210	2	0	3.11	SCT	4	2000	357.27	1000
2024	3	20	13	84.2	66.2	54.8	7.35546	3.288185	150	7	0	3.11	SCT	4	2000	0	1000
2024	3	20	14	87.8	64.4	45.88	7.35546	3.288185	190	7	0	3.73	SCT	4	2000	0	1000
2024	3	20	15	87.8	62.6	43.07	6.30468	2.818444	180	6	0	4.35	SCT	4	2000	0	1000
2024	3	20	16	91.4	57.2	31.72	6.30468	2.818444	110	6	0	4.35	SCT	4	2000	0	999
2024	3	20	17	91.4	57.2	31.72	5.2539	2.348703	220	5	0	4.97	SCT	4	2000	0	998
2024	3	20	18	93.2	57.2	29.99	4.20312	1.878963	180	4	0	4.97	SCT	4	2000	0	998

2024	3	20	19	93.2	57.2	29.99	8.40624	3.757926	180	8	0	4.97	SCT	4	2000	0	997
2024	3	20	20	95	50	21.79	9.45702	4.227666	130	9	0	4.97	SCT	4	2000	0	997
2024	3	20	21	95	50	21.79	9.45702	4.227666	130	9	0	4.97	SCT	4	2000	0	996
2024	3	20	22	96.8	50	20.62	2.10156	0.939481	150	2	0	4.97	SCT	4	2000	0	996
2024	3	20	23	98.6	48.2	18.25	8.40624	3.757926	170	8	0	4.97	SCT	4	2000	0	995
2024	3	21	0	98.6	50	19.52	6.30468	2.818444	140	6	0	4.97	SCT	4	2000	0	994.3333
2024	3	21	1	98.6	48.2	18.25	7.35546	3.288185	160	7	0	4.97	SCT	4	2000	18.8	994.3333
2024	3	21	2	98.6	50	19.52	5.2539	2.348703	120	5	0	4.97	SCT	4	2000	325.73	994.3333
2024	3	21	3	98.6	51.8	20.87	4.20312	1.878963	230	4	0	4.97	SCT	4	2000	866.03	994.3333
2024	3	21	4	98.6	53.6	22.29	5.2539	2.348703	170	5	0	4.97	SCT	4	2000	953.75	994.3333
2024	3	21	5	96.8	53.6	23.55	3.15234	1.409222	160	3	0	4.97	SCT	4	2000	985.05	1000
2024	3	21	6	77	66.2	69.33	3.15234	1.409222	320	3	0	3.11	SCT	4	2000	979.63	1001
2024	3	21	7	82.4	64.4	54.55	3.15234	1.409222	340	3	0	3.11	SCT	4	2000	969.79	1000
2024	3	21	8	86	59	40.14	3.15234	1.409222	10	3	0	3.73	SCT	4	2000	949.67	999
2024	3	21	9	89.6	57.2	33.56	3.15234	1.409222	30	3	0	4.35	SCT	4	2000	901.22	999
2024	3	21	10	89.6	57.2	33.56	3.15234	1.409222	180	3	0	4.35	SCT	4	2000	807.23	998
2024	3	21	11	89.6	55.4	31.45	3.15234	1.409222	220	3	0	4.35	SCT	4	2000	627.99	998
2024	3	21	12	93.2	55.4	28.1	4.20312	1.878963	220	4	0	4.35	SCT	4	2000	357.27	997
2024	3	21	13	93.2	53.6	26.31	3.15234	1.409222	160	3	0	4.35	SCT	4	2000	0	996
2024	3	21	14	93.2	53.6	26.31	4.20312	1.878963	210	4	0	4.35	SCT	4	2000	0	995
2024	3	21	15	93.2	53.6	26.31	5.2539	2.348703	200	5	0	4.35	SCT	4	2000	0	1000
2024	3	21	16	75.2	60.8	60.9	3.15234	1.409222	250	3	0	3.73	SCT	4	2000	0	1001
2024	3	21	17	78.8	62.6	57.6	2.10156	0.939481	180	2	0	3.73	SCT	4	2000	0	1001
2024	3	21	18	80.6	60.8	50.95	2.10156	0.939481	180	2	0	3.73	SCT	4	2000	0	1001
2024	3	21	19	82.4	60.8	48.05	3.15234	1.409222	280	3	0	3.73	SCT	4	2000	0	1000
2024	3	21	20	82.4	60.8	48.05	4.20312	1.878963	210	4	0	3.73	SCT	4	2000	0	1000
2024	3	21	21	84.2	57.2	39.86	2.10156	0.939481	180	2	0	3.73	SCT	4	2000	0	999
2024	3	21	22	86	55.4	35.25	5.2539	2.348703	200	5	0	3.11	SCT	4	2000	0	999
2024	3	21	23	86	55.4	35.25	5.2539	2.348703	200	5	0	3.11	SCT	4	2000	0	998
2024	3	22	0	87.8	53.6	31.17	3.15234	1.409222	200	3	0	3.11	SCT	4	2000	0	997
2024	3	22	1	89.6	53.6	29.45	3.15234	1.409222	200	3	0	3.73	SCT	4	2000	18.8	996
2024	3	22	2	91.4	53.6	27.83	2.10156	0.939481	180	2	0	3.73	SCT	4	2000	325.73	996

2024	3	22	3	91.4	51.8	26.05	2.10156	0.939481	180	2	0	3.73	SCT	4	2000	866.03	995
2024	3	22	4	93.2	50	23.04	2.10156	0.939481	180	2	0	3.73	SCT	4	2000	953.75	994.3333
2024	3	22	5	95	50	21.79	6.30468	2.818444	200	6	0	4.35	SCT	4	2000	985.05	994.3333
2024	3	22	6	93.2	51.8	24.63	4.20312	1.878963	220	4	0	4.35	SCT	4	2000	979.63	994.3333
2024	3	22	7	93.2	50	23.04	7.35546	3.288185	150	7	0	4.35	SCT	4	2000	969.79	994.3333
2024	3	22	8	93.2	51.8	24.63	3.15234	1.409222	250	3	0	4.35	SCT	4	2000	949.67	994.3333
2024	3	22	9	91.4	57.2	31.72	3.15234	1.409222	240	3	0	4.35	SCT	4	1800	901.22	999
2024	3	22	10	77	68	73.78	4.20312	1.878963	350	4	0	2.49	SCT	4	1800	807.23	1000
2024	3	22	11	80.6	66.2	61.58	4.20312	1.878963	10	4	0	3.11	SCT	4	2000	627.99	1000
2024	3	22	12	84.2	64.4	51.47	3.15234	1.409222	40	3	0	3.11	SCT	4	2000	357.27	999
2024	3	22	13	86	60.8	42.8	2.10156	0.939481	180	2	0	3.11	SCT	4	2000	0	998
2024	3	22	14	89.6	57.2	33.56	3.15234	1.409222	200	3	0	3.11	SCT	4	2000	0	997
2024	3	22	15	91.4	53.6	27.83	2.10156	0.939481	180	2	0	3.11	SCT	4	2000	0	996
2024	3	22	16	93.2	51.8	24.63	3.15234	1.409222	10	3	0	3.11	SCT	4	2000	0	996
2024	3	22	17	93.2	51.8	24.63	6.30468	2.818444	140	6	0	3.11	SCT	4	2000	0	995
2024	3	22	18	93.2	51.8	24.63	3.15234	1.409222	140	3	0	3.73	SCT	4	2000	0	994.3333
2024	3	22	19	95	51.8	23.3	4.20312	1.878963	130	4	0	3.73	SCT	4	2000	0	993.3333
2024	3	22	20	95	51.8	23.3	7.35546	3.288185	200	7	0	3.73	SCT	4	2000	0	993.3333
2024	3	22	21	95	51.8	23.3	6.30468	2.818444	200	6	0	3.73	SCT	4	2000	0	993.3333
2024	3	22	22	95	53.6	24.89	3.15234	1.409222	180	3	0	3.73	SCT	4	2000	0	993.3333
2024	3	22	23	95	53.6	24.89	5.2539	2.348703	190	5	0	3.73	SCT	4	2000	0	999
2024	3	23	0	77	66.2	69.33	3.15234	1.409222	250	3	0	3.11	SCT	4	2000	0	999
2024	3	23	1	78.8	68	69.52	3.15234	1.409222	340	3	0	3.11	SCT	4	2000	18.8	999
2024	3	23	2	80.6	68	65.54	3.15234	1.409222	220	3	0	3.11	SCT	4	2000	325.73	999
2024	3	23	3	84.2	68	58.32	4.20312	1.878963	250	4	0	3.11	SCT	4	2000	866.03	998
2024	3	23	4	86	66.2	51.72	3.15234	1.409222	280	3	0	3.11	SCT	4	2000	953.75	998
2024	3	23	5	87.8	66.2	48.84	3.15234	1.409222	100	3	0	3.11	SCT	4	2000	985.05	997
2024	3	23	6	87.8	60.8	40.41	4.20312	1.878963	130	4	0	3.11	SCT	4	2000	979.63	997
2024	3	23	7	89.6	59	35.81	3.15234	1.409222	240	3	0	3.11	SCT	4	1800	969.79	996
2024	3	23	8	91.4	57.2	31.72	4.20312	1.878963	220	4	0	3.11	SCT	4	1800	949.67	995
2024	3	23	9	91.4	55.4	29.72	3.15234	1.409222	180	3	0	3.11	SCT	4	1800	901.22	994.3333
2024	3	23	10	95	55.4	26.58	3.15234	1.409222	160	3	0	3.11	SCT	4	1800	807.23	993.3333

2024	3	23	11	95	55.4	26.58	5.2539	2.348703	150	5	0	3.11	SCT	4	1800	627.99	993.3333
2024	3	23	12	95	53.6	24.89	4.20312	1.878963	180	4	0	3.11	SCT	4	1800	357.27	998
2024	3	23	13	75.2	69.8	83.32	3.15234	1.409222	70	3	0	3.11	SCT	4	1800	0	999
2024	3	23	14	80.6	69.8	69.71	3.15234	1.409222	340	3	0	3.11	SCT	4	2000	0	999
2024	3	23	15	82.4	69.8	65.74	3.15234	1.409222	230	3	0	3.11	SCT	4	2000	0	998
2024	3	23	16	84.2	69.8	62.03	3.15234	1.409222	200	3	0	3.11	SCT	4	2000	0	998
2024	3	23	17	86	66.2	51.72	3.15234	1.409222	10	3	0	3.11	SCT	4	2000	0	998
2024	3	23	18	89.6	66.2	46.14	4.20312	1.878963	250	4	0	3.11	SCT	4	2000	0	997
2024	3	23	19	89.6	62.6	40.69	4.20312	1.878963	240	4	0	3.11	SCT	4	2000	0	996
2024	3	23	20	91.4	57.2	31.72	4.20312	1.878963	140	4	0	3.11	SCT	4	2000	0	996
2024	3	23	21	91.4	57.2	31.72	4.20312	1.878963	150	4	0	3.11	SCT	4	2000	0	995
2024	3	23	22	95	57.2	28.37	4.20312	1.878963	180	4	0	3.11	SCT	4	2000	0	994.3333
2024	3	23	23	95	55.4	26.58	4.20312	1.878963	290	4	0	3.73	SCT	4	2000	0	993.3333
2024	3	24	0	96.8	44.6	16.83	4.20312	1.878963	160	4	0	3.73	SCT	4	2000	0	993.3333
2024	3	24	1	96.8	44.6	16.83	5.2539	2.348703	140	5	0	3.73	SCT	4	2000	18.8	993.3333
2024	3	24	2	98.6	42.8	14.87	4.20312	1.878963	120	4	0	3.73	SCT	4	2000	325.73	993.3333
2024	3	24	3	96.8	44.6	16.83	8.40624	3.757926	130	8	0	4.35	SCT	4	2000	866.03	993.3333
2024	3	24	4	96.8	44.6	16.83	8.40624	3.757926	110	8	0	4.35	SCT	4	2000	953.75	993.3333
2024	3	24	5	95	48.2	20.38	8.40624	3.757926	110	8	0	4.35	SCT	4	2000	985.05	993.3333
2024	3	24	6	95	50	21.79	8.40624	3.757926	110	8	0	4.35	SCT	4	1800	979.63	999
2024	3	24	7	77	66.2	69.33	3.15234	1.409222	250	3	0	3.11	SCT	4	2000	969.79	999
2024	3	24	8	80.6	69.8	69.71	3.15234	1.409222	250	3	0	3.11	SCT	4	2000	949.67	999
2024	3	24	9	84.2	69.8	62.03	3.15234	1.409222	220	3	0	3.11	SCT	4	2000	901.22	998
2024	3	24	10	86	68	55.04	5.2539	2.348703	220	5	0	3.11	SCT	4	2000	807.23	998
2024	3	24	11	87.8	64.4	45.88	4.20312	1.878963	170	4	0	3.11	SCT	4	2000	627.99	997
2024	3	24	12	91.4	60.8	36.08	5.2539	2.348703	150	5	0	3.11	SCT	4	2000	357.27	996
2024	3	24	13	91.4	51.8	26.05	4.20312	1.878963	200	4	0	3.11	SCT	4	2000	0	995
2024	3	24	14	93.2	53.6	26.31	6.30468	2.818444	170	6	0	3.11	SCT	4	2000	0	994.3333
2024	3	24	15	95	55.4	26.58	5.2539	2.348703	120	5	0	3.11	SCT	4	2000	0	998
2024	3	24	16	77	66.2	69.33	2.10156	0.939481	180	2	0	2.49	SCT	4	2000	0	999
2024	3	24	17	82.4	68	61.81	2.10156	0.939481	180	2	0	3.11	SCT	4	2000	0	999
2024	3	24	18	84.2	64.4	51.47	2.10156	0.939481	180	2	0	3.11	SCT	4	2000	0	998

2024	3	24	19	84.2	64.4	51.47	4.20312	1.878963	210	4	0	3.11	SCT	4	2000	0	998
2024	3	24	20	87.8	62.6	43.07	3.15234	1.409222	220	3	0	3.11	SCT	4	2000	0	998
2024	3	24	21	89.6	62.6	40.69	3.15234	1.409222	300	3	0	3.11	SCT	4	2000	0	997
2024	3	24	22	89.6	55.4	31.45	3.15234	1.409222	210	3	0	3.11	SCT	4	2000	0	996
2024	3	24	23	91.4	53.6	27.83	3.15234	1.409222	60	3	0	3.11	SCT	4	2000	0	995
2024	3	25	0	95	51.8	23.3	5.2539	2.348703	260	5	0	3.73	SCT	4	2000	0	994.3333
2024	3	25	1	96.8	51.8	22.04	6.30468	2.818444	250	6	0	3.73	SCT	4	2000	18.8	993.3333
2024	3	25	2	96.8	48.2	19.28	5.2539	2.348703	210	5	0	4.35	SCT	4	2000	325.73	993.3333
2024	3	25	3	98.6	42.8	14.87	8.40624	3.757926	140	8	0	4.35	SCT	4	2000	866.03	992.3333
2024	3	25	4	98.6	42.8	14.87	5.2539	2.348703	180	5	0	4.35	SCT	4	2000	953.75	992.3333
2024	3	25	5	96.8	44.6	16.83	5.2539	2.348703	160	5	0	4.35	SCT	4	2000	985.05	992.3333
2024	3	25	6	96.8	44.6	16.83	6.30468	2.818444	130	6	0	4.35	SCT	4	2000	979.63	999
2024	3	25	7	78.8	64.4	61.36	2.10156	0.939481	180	2	0	2.49	SCT	4	2000	969.79	999
2024	3	25	8	82.4	62.6	51.21	2.10156	0.939481	180	2	0	2.8	SCT	4	2000	949.67	999
2024	3	25	9	86	62.6	45.61	4.20312	1.878963	190	4	0	3.11	SCT	4	2000	901.22	998
2024	3	25	10	89.6	60.8	38.18	6.30468	2.818444	180	6	0	3.11	SCT	4	2000	807.23	997
2024	3	25	11	89.6	57.2	33.56	5.2539	2.348703	180	5	0	3.11	SCT	4	2000	627.99	997
2024	3	25	12	91.4	53.6	27.83	5.2539	2.348703	200	5	0	3.73	SCT	4	2000	357.27	995
2024	3	25	13	95	51.8	23.3	4.20312	1.878963	170	4	0	3.73	SCT	4	2000	0	994.3333
2024	3	25	14	95	50	21.79	5.2539	2.348703	230	5	0	3.73	SCT	4	2000	0	994.3333
2024	3	25	15	96.8	50	20.62	5.2539	2.348703	200	5	0	4.35	SCT	4	2000	0	993.3333
2024	3	25	16	96.8	50	20.62	4.20312	1.878963	200	4	0	4.97	SCT	4	2000	0	993.3333
2024	3	25	17	95	50	21.79	6.30468	2.818444	190	6	0	4.97	SCT	4	2000	0	998
2024	3	25	18	80.6	68	65.54	3.15234	1.409222	130	3	0	3.11	SCT	4	2000	0	999
2024	3	25	19	84.2	64.4	51.47	3.15234	1.409222	160	3	0	3.11	SCT	4	2000	0	999
2024	3	25	20	86	64.4	48.58	5.2539	2.348703	180	5	0	3.11	SCT	4	2000	0	998
2024	3	25	21	86	66.2	51.72	3.15234	1.409222	200	3	0	3.11	SCT	4	2000	0	998
2024	3	25	22	87.8	66.2	48.84	3.15234	1.409222	160	3	0	3.11	SCT	4	2000	0	998
2024	3	25	23	89.6	62.6	40.69	5.2539	2.348703	140	5	0	3.11	SCT	4	2000	0	997
2024	3	26	0	91.4	62.6	38.45	6.30468	2.818444	280	6	0	3.11	SCT	4	2000	0	996
2024	3	26	1	91.4	60.8	36.08	6.30468	2.818444	240	6	0	3.73	SCT	4	2000	18.8	995
2024	3	26	2	93.2	59	31.99	4.20312	1.878963	160	4	0	3.73	SCT	4	2000	325.73	995

2024	3	26	3	95	59	30.26	4.20312	1.878963	200	4	0	4.35	SCT	4	2000	866.03	994.3333
2024	3	26	4	95	57.2	28.37	4.20312	1.878963	120	4	0	4.35	SCT	4	2000	953.75	994.3333
2024	3	26	5	95	55.4	26.58	5.2539	2.348703	130	5	0	4.35	SCT	4	2000	985.05	993.3333
2024	3	26	6	96.8	55.4	25.15	8.40624	3.757926	170	8	0	4.35	SCT	4	2000	979.63	993.3333
2024	3	26	7	96.8	59	28.63	5.2539	2.348703	250	5	0	4.35	SCT	4	1800	969.79	993.3333
2024	3	26	8	96.8	57.2	26.84	8.40624	3.757926	190	8	0	4.35	SCT	4	1800	949.67	993.3333
2024	3	26	9	96.8	57.2	26.84	8.40624	3.757926	210	8	0	4.35	SCT	4	1800	901.22	993.3333
2024	3	26	10	96.8	57.2	26.84	6.30468	2.818444	200	6	0	4.35	SCT	4	1800	807.23	993.3333
2024	3	26	11	95	57.2	28.37	5.2539	2.348703	210	5	0	4.35	FEW	2	1000	627.99	1000
2024	3	26	12	80.6	73.4	78.76	4.20312	1.878963	180	4	0	3.11	FEW	2	1000	357.27	1001
2024	3	26	13	82.4	71.6	69.9	4.20312	1.878963	190	4	0	3.11	FEW	2	1000	0	1001
2024	3	26	14	84.2	69.8	62.03	4.20312	1.878963	180	4	0	3.11	FEW	2	1000	0	1000
2024	3	26	15	86	68	55.04	6.30468	2.818444	160	6	0	3.11	FEW	2	1000	0	999
2024	3	26	16	87.8	68	51.98	6.30468	2.818444	200	6	0	3.11	SCT	4	2000	0	998
2024	3	26	17	89.6	64.4	43.34	8.40624	3.757926	180	8	0	3.11	SCT	4	2000	0	998
2024	3	26	18	91.4	60.8	36.08	7.35546	3.288185	130	7	0	3.11	SCT	4	2000	0	997
2024	3	26	19	93.2	60.8	34.11	8.40624	3.757926	180	8	0	3.11	SCT	4	2000	0	996
2024	3	26	20	95	59	30.26	8.40624	3.757926	190	8	0	3.73	FEW	2	1500	0	995
2024	3	26	21	95	57.2	28.37	5.2539	2.348703	110	5	0	4.35	FEW	2	1500	0	995
2024	3	26	22	95	57.2	28.37	5.2539	2.348703	180	5	0	4.35	FEW	2	1500	0	995
2024	3	26	23	95	59	30.26	7.35546	3.288185	190	7	0	4.35	FEW	2	1500	0	995
2024	3	27	0	95	59	30.26	6.30468	2.818444	170	6	0	4.35	SCT	4	2000	0	995
2024	3	27	1	95	51.8	23.3	6.30468	2.818444	120	6	0	4.35	SCT	4	2000	18.8	996
2024	3	27	2	93.2	51.8	24.63	6.30468	2.818444	110	6	0	4.35	SCT	4	2000	325.73	1002
2024	3	27	3	80.6	64.4	57.84	2.10156	0.939481	180	2	0	3.11	SCT	4	2000	866.03	1002
2024	3	27	4	82.4	62.6	51.21	2.10156	0.939481	180	2	0	3.11	SCT	4	2000	953.75	1003
2024	3	27	5	82.4	60.8	48.05	2.10156	0.939481	180	2	0	3.11	FEW	2	1500	985.05	1002
2024	3	27	6	84.2	60.8	45.34	3.15234	1.409222	10	3	0	3.11	FEW	2	1500	979.63	1002
2024	3	27	7	86	60.8	42.8	2.10156	0.939481	180	2	0	3.11	FEW	2	1500	969.79	1002
2024	3	27	8	86	60.8	42.8	4.20312	1.878963	170	4	0	3.11	FEW	2	1500	949.67	1001
2024	3	27	9	89.6	57.2	33.56	4.20312	1.878963	70	4	0	3.11	FEW	2	1500	901.22	1000
2024	3	27	10	91.4	55.4	29.72	3.15234	1.409222	110	3	0	3.11	FEW	2	1500	807.23	1000

2024	3	27	11	91.4	55.4	29.72	6.30468	2.818444	190	6	0	3.11	SCT	4	2000	627.99	999
2024	3	27	12	93.2	55.4	28.1	6.30468	2.818444	240	6	0	3.11	SCT	4	2000	357.27	998
2024	3	27	13	95	53.6	24.89	4.20312	1.878963	260	4	0	3.11	SCT	4	2000	0	998
2024	3	27	14	95	53.6	24.89	4.20312	1.878963	110	4	0	3.73	SCT	4	2000	0	997
2024	3	27	15	95	51.8	23.3	4.20312	1.878963	140	4	0	3.73	SCT	4	2000	0	996
2024	3	27	16	96.8	51.8	22.04	5.2539	2.348703	170	5	0	3.73	SCT	4	2000	0	996
2024	3	27	17	96.8	51.8	22.04	7.35546	3.288185	90	7	0	4.35	SCT	4	2000	0	995
2024	3	27	18	96.8	53.6	23.55	10.5078	4.697407	100	10	0	4.35	SCT	4	2000	0	995
2024	3	27	19	95	53.6	24.89	10.5078	4.697407	100	10	0	4.35	SCT	4	2000	0	996
2024	3	27	20	93.2	55.4	28.1	10.5078	4.697407	110	10	0	4.35	SCT	4	2000	0	1001
2024	3	27	21	77	69.8	78.48	5.2539	2.348703	160	5	0	2.49	SCT	4	2000	0	1002
2024	3	27	22	80.6	64.4	57.84	4.20312	1.878963	110	4	0	3.11	SCT	4	2000	0	1002
2024	3	27	23	84.2	64.4	51.47	2.10156	0.939481	180	2	0	3.11	SCT	4	2000	0	1001
2024	3	28	0	86	62.6	45.61	5.2539	2.348703	150	5	0	3.11	SCT	4	2000	0	1001
2024	3	28	1	86	62.6	45.61	4.20312	1.878963	230	4	0	3.11	SCT	4	2000	18.8	1000
2024	3	28	2	89.6	57.2	33.56	5.2539	2.348703	180	5	0	3.11	SCT	4	2000	325.73	1000
2024	3	28	3	91.4	55.4	29.72	5.2539	2.348703	210	5	0	3.11	SCT	4	2000	866.03	999
2024	3	28	4	91.4	57.2	31.72	7.35546	3.288185	170	7	0	3.11	SCT	4	2000	953.75	998
2024	3	28	5	93.2	53.6	26.31	8.40624	3.757926	210	8	0	3.73	SCT	4	2000	985.05	998
2024	3	28	6	93.2	53.6	26.31	7.35546	3.288185	220	7	0	3.73	SCT	4	2000	979.63	997
2024	3	28	7	95	53.6	24.89	5.2539	2.348703	200	5	0	3.73	SCT	4	2000	969.79	996
2024	3	28	8	95	53.6	24.89	4.20312	1.878963	290	4	0	3.73	SCT	4	2000	949.67	996
2024	3	28	9	95	53.6	24.89	5.2539	2.348703	200	5	0	3.73	SCT	4	2000	901.22	995
2024	3	28	10	96.8	51.8	22.04	6.30468	2.818444	180	6	0	3.73	SCT	4	2000	807.23	995
2024	3	28	11	96.8	51.8	22.04	6.30468	2.818444	150	6	0	3.73	SCT	4	2000	627.99	995
2024	3	28	12	96.8	50	20.62	5.2539	2.348703	130	5	0	3.73	FEW	2	2000	357.27	995
2024	3	28	13	95	53.6	24.89	8.40624	3.757926	100	8	0	3.73	SCT	4	2000	0	1000
2024	3	28	14	80.6	68	65.54	3.15234	1.409222	140	3	0	3.11	SCT	4	2000	0	1000
2024	3	28	15	82.4	68	61.81	3.15234	1.409222	130	3	0	3.11	SCT	4	2000	0	1000
2024	3	28	16	87.8	57.2	35.53	6.30468	2.818444	170	6	0	3.11	SCT	4	2000	0	999
2024	3	28	17	89.6	50	25.79	6.30468	2.818444	160	6	0	3.11	SCT	4	2000	0	998
2024	3	28	18	91.4	50	24.37	7.35546	3.288185	200	7	0	3.11	SCT	4	2000	0	998

2024	3	28	19	91.4	50	24.37	6.30468	2.818444	190	6	0	3.73	FEW	2	2000	0	997
2024	3	28	20	93.2	51.8	24.63	6.30468	2.818444	220	6	0	3.73	FEW	2	2000	0	997
2024	3	28	21	95	53.6	24.89	8.40624	3.757926	200	8	0	3.73	FEW	2	2000	0	996
2024	3	28	22	95	53.6	24.89	5.2539	2.348703	140	5	0	3.73	FEW	2	2000	0	995
2024	3	28	23	95	53.6	24.89	2.10156	0.939481	180	2	0	3.73	FEW	2	2000	0	995
2024	3	29	0	95	53.6	24.89	8.40624	3.757926	190	8	0	3.73	FEW	2	2000	0	994.3333
2024	3	29	1	96.8	53.6	23.55	4.20312	1.878963	40	4	0	3.73	FEW	2	2000	18.8	994.3333
2024	3	29	2	96.8	53.6	23.55	5.2539	2.348703	180	5	0	3.73	FEW	2	2000	325.73	994.3333
2024	3	29	3	96.8	53.6	23.55	5.2539	2.348703	230	5	0	3.73	FEW	2	2000	866.03	994.3333
2024	3	29	4	95	53.6	24.89	2.10156	0.939481	210	2	0	3.73	FEW	2	2000	953.75	999
2024	3	29	5	80.6	66.2	61.58	4.20312	1.878963	120	4	0	3.11	FEW	2	2000	985.05	1000
2024	3	29	6	84.2	69.8	62.03	5.2539	2.348703	190	5	0	3.11	FEW	2	2000	979.63	1000
2024	3	29	7	84.2	69.8	62.03	2.10156	0.939481	210	2	0	3.11	FEW	2	2000	969.79	999
2024	3	29	8	87.8	69.8	55.29	2.10156	0.939481	210	2	0	3.11	FEW	2	2000	949.67	999
2024	3	29	9	87.8	69.8	55.29	3.15234	1.409222	180	3	0	3.11	FEW	2	2000	901.22	998
2024	3	29	10	89.6	68	49.1	3.15234	1.409222	170	3	0	3.11	FEW	2	2000	807.23	998
2024	3	29	11	91.4	64.4	40.96	3.15234	1.409222	180	3	0	3.11	SCT	4	2000	627.99	997
2024	3	29	12	95	59	30.26	4.20312	1.878963	280	4	0	3.11	SCT	4	2000	357.27	996
2024	3	29	13	95	55.4	26.58	4.20312	1.878963	120	4	0	3.11	SCT	4	2000	0	996
2024	3	29	14	95	55.4	26.58	6.30468	2.818444	150	6	0	3.11	SCT	4	2000	0	995
2024	3	29	15	96.8	55.4	25.15	4.20312	1.878963	220	4	0	3.11	SCT	4	2000	0	994.3333
2024	3	29	16	96.8	55.4	25.15	5.2539	2.348703	180	5	0	3.11	SCT	4	2000	0	994.3333
2024	3	29	17	96.8	57.2	26.84	6.30468	2.818444	150	6	0	3.73	SCT	4	2000	0	993.3333
2024	3	29	18	98.6	55.4	23.81	5.2539	2.348703	90	5	0	3.73	FEW	2	2000	0	993.3333
2024	3	29	19	98.6	57.2	25.41	4.20312	1.878963	320	4	0	3.73	FEW	2	2000	0	993.3333
2024	3	29	20	98.6	57.2	25.41	7.35546	3.288185	180	7	0	3.73	FEW	2	2000	0	993.3333
2024	3	29	21	98.6	57.2	25.41	4.20312	1.878963	130	4	0	3.73	SCT	4	2000	0	993.3333
2024	3	29	22	96.8	57.2	26.84	5.2539	2.348703	150	5	0	3.73	SCT	4	2000	0	998
2024	3	29	23	80.6	69.8	69.71	3.15234	1.409222	140	3	0	3.11	SCT	4	2000	0	999
2024	3	30	0	82.4	68	61.81	6.30468	2.818444	170	6	0	3.11	SCT	4	2000	0	998
2024	3	30	1	86	68	55.04	6.30468	2.818444	190	6	0	3.11	SCT	4	2000	18.8	997
2024	3	30	2	87.8	68	51.98	5.2539	2.348703	70	5	0	3.11	SCT	4	2000	325.73	997

2024	3	30	3	91.4	68	46.41	4.20312	1.878963	90	4	0	3.11	SCT	4	2000	866.03	996
2024	3	30	4	91.4	66.2	43.61	5.2539	2.348703	170	5	0	3.11	SCT	4	2000	953.75	995
2024	3	30	5	93.2	66.2	41.23	3.15234	1.409222	130	3	0	3.11	SCT	4	2000	985.05	994.3333
2024	3	30	6	95	64.4	36.63	5.2539	2.348703	260	5	0	3.11	SCT	4	2000	979.63	993.3333
2024	3	30	7	96.8	60.8	30.53	8.40624	3.757926	160	8	0	3.73	SCT	4	2000	969.79	992.3333
2024	3	30	8	96.8	60.8	30.53	5.2539	2.348703	190	5	0	3.73	SCT	4	2000	949.67	992.3333
2024	3	30	9	96.8	60.8	30.53	6.30468	2.818444	260	6	0	3.73	SCT	4	2000	901.22	993.3333
2024	3	30	10	96.8	62.6	32.54	7.35546	3.288185	190	7	0	3.73	SCT	4	2000	807.23	999
2024	3	30	11	80.6	69.8	69.71	3.15234	1.409222	350	3	0	3.11	SCT	4	2000	627.99	999
2024	3	30	12	82.4	69.8	65.74	3.15234	1.409222	180	3	0	3.11	SCT	4	2000	357.27	1000
2024	3	30	13	86	66.2	51.72	4.20312	1.878963	160	4	0	3.11	SCT	4	2000	0	999
2024	3	30	14	86	66.2	51.72	5.2539	2.348703	170	5	0	3.11	SCT	4	2000	0	999
2024	3	30	15	87.8	66.2	48.84	6.30468	2.818444	130	6	0	3.73	SCT	4	2000	0	998
2024	3	30	16	87.8	64.4	45.88	5.2539	2.348703	90	5	0	3.73	SCT	4	2000	0	997
2024	3	30	17	89.6	64.4	43.34	7.35546	3.288185	170	7	0	3.73	SCT	4	2000	0	996
2024	3	30	18	91.4	64.4	40.96	6.30468	2.818444	170	6	0	3.73	SCT	4	2000	0	996
2024	3	30	19	91.4	60.8	36.08	5.2539	2.348703	150	5	0	3.73	SCT	4	2000	0	995
2024	3	30	20	93.2	60.8	34.11	6.30468	2.818444	170	6	0	3.73	SCT	4	2000	0	995
2024	3	30	21	95	62.6	34.39	6.30468	2.818444	170	6	0	3.73	SCT	4	2000	0	994.3333
2024	3	30	22	95	62.6	34.39	7.35546	3.288185	190	7	0	4.35	SCT	4	2000	0	994.3333
2024	3	30	23	95	60.8	32.27	7.35546	3.288185	190	7	0	4.35	SCT	4	2000	0	993.3333
2024	3	31	0	96.8	60.8	30.53	8.40624	3.757926	180	8	0	4.35	SCT	4	2000	0	993.3333
2024	3	31	1	96.8	60.8	30.53	5.2539	2.348703	170	5	0	4.35	SCT	4	2000	18.8	993.3333
2024	3	31	2	96.8	59	28.63	8.40624	3.757926	150	8	0	4.35	SCT	4	2000	325.73	993.3333
2024	3	31	3	96.8	53.6	23.55	8.40624	3.757926	110	8	0	4.35	SCT	4	2000	866.03	994.3333
2024	3	31	4	95	53.6	24.89	8.40624	3.757926	110	8	0	4.35	SCT	4	2000	953.75	999
2024	3	31	5	80.6	71.6	74.11	5.2539	2.348703	30	5	0	3.11	SCT	4	2000	985.05	999
2024	3	31	6	82.4	69.8	65.74	2.10156	0.939481	210	2	0	3.11	SCT	4	2000	979.63	999
2024	3	31	7	84.2	68	58.32	6.30468	2.818444	120	6	0	3.11	SCT	4	2000	969.79	998
2024	3	31	8	87.8	66.2	48.84	6.30468	2.818444	170	6	0	3.73	SCT	4	2000	949.67	998
2024	3	31	9	89.6	64.4	43.34	6.30468	2.818444	180	6	0	4.35	SCT	4	2000	901.22	997
2024	3	31	10	91.4	62.6	38.45	8.40624	3.757926	160	8	0	4.35	SCT	4	2000	807.23	996

2024	3	31	11	91.4	60.8	36.08	9.45702	4.227666	130	9	0	4.97	SCT	4	2000	627.99	996
2024	3	31	12	93.2	59	31.99	6.30468	2.818444	140	6	0	4.97	SCT	4	2000	357.27	995
2024	3	31	13	95	51.8	23.3	9.45702	4.227666	150	9	0	4.97	SCT	4	2000	0	994.3333
2024	3	31	14	95	50	21.79	8.40624	3.757926	150	8	0	4.97	SCT	4	2000	0	994.3333
2024	3	31	15	96.8	46.4	18.02	9.45702	4.227666	120	9	0	4.97	SCT	4	2000	0	994.3333
2024	3	31	16	96.8	42.8	15.71	9.45702	4.227666	130	9	0	4.97	SCT	4	2000	0	994.3333
2024	3	31	17	95	50	21.79	7.35546	3.288185	120	7	0	4.97	SCT	4	2000	0	994.3333
2024	3	31	18	95	48.2	20.38	10.5078	4.697407	120	10	0	4.97	SCT	4	2000	0	994.3333
2024	3	31	19	93.2	48.2	21.54	9.45702	4.227666	120	9	0	4.97	SCT	4	2000	0	999
2024	3	31	20	78.8	69.8	73.95	3.15234	1.409222	250	3	0	3.11	SCT	4	2000	0	1000
2024	3	31	21	82.4	69.8	65.74	3.15234	1.409222	40	3	0	3.11	SCT	4	2000	0	1000
2024	3	31	22	82.4	69.8	65.74	3.15234	1.409222	250	3	0	3.11	SCT	4	2000	0	999
2024	3	31	23	84.2	69.8	62.03	3.15234	1.409222	220	3	0	3.11	SCT	4	2000	0	998
2024	4	1	0	82.4	75.2	78.9	4.20312	1.878963	190	4	0	3.11	SCT	4	2000	0	998
2024	4	1	1	86	71.6	62.25	7.35546	3.288185	120	7	0	3.73	SCT	4	2000	0	998
2024	4	1	2	86	71.6	62.25	5.2539	2.348703	180	5	0	3.73	SCT	4	2000	30.94	997
2024	4	1	3	87.8	69.8	55.29	3.15234	1.409222	290	3	0	3.73	SCT	4	2000	697.85	997
2024	4	1	4	91.4	69.8	49.36	6.30468	2.818444	190	6	0	3.73	SCT	4	2000	848.94	996
2024	4	1	5	91.4	69.8	49.36	3.15234	1.409222	140	3	0	4.35	SCT	4	2000	926.14	996
2024	4	1	6	93.2	68	43.88	2.10156	0.939481	60	2	0	4.35	SCT	4	2000	916.73	995
2024	4	1	7	93.2	68	43.88	9.45702	4.227666	160	9	0	4.35	SCT	4	2000	897.95	994.3333
2024	4	1	8	95	68	41.5	4.20312	1.878963	180	4	0	4.97	SCT	4	2000	861.16	993.3333
2024	4	1	9	95	68	41.5	2.10156	0.939481	60	2	0	4.97	SCT	4	2000	807.62	993.3333
2024	4	1	10	95	66.2	39	2.10156	0.939481	60	2	0	4.97	SCT	4	2000	702.42	992.3333
2024	4	1	11	96.8	62.6	32.54	2.10156	0.939481	60	2	0	4.97	SCT	4	2000	525.86	991.3333
2024	4	1	12	98.6	60.8	28.9	6.30468	2.818444	180	6	0	4.97	SCT	4	2000	291.73	991.3333
2024	4	1	13	98.6	60.8	28.9	3.15234	1.409222	250	3	0	4.97	SCT	4	2000	0	991.3333
2024	4	1	14	98.6	60.8	28.9	4.20312	1.878963	150	4	0	4.97	SCT	4	2000	0	991.3333
2024	4	1	15	98.6	60.8	28.9	3.15234	1.409222	140	3	0	4.97	SCT	4	2000	0	991.3333
2024	4	1	16	98.6	62.6	30.8	4.20312	1.878963	140	4	0	4.97	SCT	4	2000	0	996
2024	4	1	17	86	71.6	62.25	4.20312	1.878963	140	4	0	3.11	SCT	4	2000	0	996
2024	4	1	18	87.8	71.6	58.78	3.15234	1.409222	170	3	0	3.73	SCT	4	2000	0	995

2024	4	1	19	89.6	69.8	52.23	3.15234	1.409222	250	3	0	3.73	SCT	4	2000	0	995
2024	4	1	20	91.4	71.6	52.48	4.20312	1.878963	200	4	0	3.73	SCT	4	2000	0	994.3333
2024	4	1	21	93.2	69.8	46.67	3.15234	1.409222	160	3	0	3.73	SCT	4	2000	0	994.3333
2024	4	1	22	93.2	69.8	46.67	8.40624	3.757926	220	8	0	3.73	SCT	4	2000	0	993.3333
2024	4	1	23	95	69.8	44.14	7.35546	3.288185	170	7	0	3.73	SCT	4	2000	0	992.3333
2024	4	2	0	96.8	68	39.27	5.2539	2.348703	250	5	0	3.73	SCT	4	2000	0	991.3333
2024	4	2	1	96.8	68	39.27	6.30468	2.818444	190	6	0	4.35	SCT	4	2000	0	991.3333
2024	4	2	2	98.6	68	37.17	7.35546	3.288185	230	7	0	4.35	SCT	4	2000	30.94	990.3333
2024	4	2	3	100.4	66.2	33.08	6.30468	2.818444	190	6	0	4.35	SCT	4	2000	697.85	990.3333
2024	4	2	4	100.4	64.4	31.07	6.30468	2.818444	140	6	0	4.35	SCT	4	2000	848.94	989.3333
2024	4	2	5	100.4	64.4	31.07	4.20312	1.878963	220	4	0	4.35	SCT	4	2000	926.14	989.3333
2024	4	2	6	96.8	66.2	36.9	8.40624	3.757926	140	8	0	4.35	SCT	4	2000	916.73	997
2024	4	2	7	84.2	73.4	70.08	7.35546	3.288185	140	7	0	3.73	SCT	4	1800	897.95	997
2024	4	2	8	87.8	73.4	62.47	7.35546	3.288185	140	7	0	3.73	SCT	4	1800	861.16	997
2024	4	2	9	87.8	73.4	62.47	3.15234	1.409222	130	3	0	3.73	SCT	4	2000	807.62	996
2024	4	2	10	89.6	73.4	59.01	8.40624	3.757926	170	8	0	3.73	SCT	4	2000	702.42	996
2024	4	2	11	91.4	71.6	52.48	6.30468	2.818444	150	6	0	3.73	SCT	4	2000	525.86	996
2024	4	2	12	91.4	69.8	49.36	6.30468	2.818444	150	6	0	4.35	SCT	4	2000	291.73	995
2024	4	2	13	93.2	66.2	41.23	10.5078	4.697407	190	10	0	4.35	SCT	4	2000	0	994.3333
2024	4	2	14	95	66.2	39	8.40624	3.757926	150	8	0	4.35	SCT	4	2000	0	993.3333
2024	4	2	15	96.8	64.4	34.66	10.5078	4.697407	190	10	0	4.35	SCT	4	2000	0	993.3333
2024	4	2	16	96.8	59	28.63	6.30468	2.818444	190	6	0	4.97	SCT	4	2000	0	992.3333
2024	4	2	17	98.6	64.4	32.81	5.2539	2.348703	240	5	0	4.97	SCT	4	2000	0	992.3333
2024	4	2	18	98.6	59	27.1	2.10156	0.939481	60	2	0	4.97	SCT	4	2000	0	991.3333
2024	4	2	19	98.6	59	27.1	4.20312	1.878963	150	4	0	4.97	SCT	4	2000	0	991.3333
2024	4	2	20	100.4	59	25.67	5.2539	2.348703	200	5	0	4.97	SCT	4	2000	0	991.3333
2024	4	2	21	98.6	59	27.1	5.2539	2.348703	140	5	0	4.97	SCT	4	2000	0	991.3333
2024	4	2	22	98.6	59	27.1	3.15234	1.409222	120	3	0	4.97	SCT	4	2000	0	990.3333
2024	4	2	23	98.6	59	27.1	4.20312	1.878963	150	4	0	4.97	SCT	4	2000	0	991.3333
2024	4	3	0	98.6	59	27.1	2.10156	0.939481	60	2	0	4.97	SCT	4	2000	0	997
2024	4	3	1	87.8	69.8	55.29	2.10156	0.939481	60	2	0	3.11	SCT	4	2000	0	997
2024	4	3	2	87.8	71.6	58.78	6.30468	2.818444	190	6	0	3.73	SCT	4	2000	30.94	997

2024	4	3	3	91.4	68	46.41	4.20312	1.878963	200	4	0	3.73	SCT	4	2000	697.85	996
2024	4	3	4	93.2	68	43.88	4.20312	1.878963	190	4	0	3.73	SCT	4	2000	848.94	996
2024	4	3	5	93.2	66.2	41.23	2.10156	0.939481	60	2	0	4.35	SCT	4	1800	926.14	995
2024	4	3	6	96.8	60.8	30.53	8.40624	3.757926	170	8	0	4.97	SCT	4	1800	916.73	993.3333
2024	4	3	7	98.6	60.8	28.9	5.2539	2.348703	100	5	0	4.97	SCT	4	1800	897.95	992.3333
2024	4	3	8	100.4	59	25.67	2.10156	0.939481	60	2	0	4.97	SCT	4	1800	861.16	991.3333
2024	4	3	9	100.4	57.2	24.06	2.10156	0.939481	60	2	0	4.97	SCT	4	1800	807.62	991.3333
2024	4	3	10	102.2	55.4	21.36	6.30468	2.818444	140	6	0	4.97	SCT	4	1800	702.42	991.3333
2024	4	3	11	100.4	53.6	21.11	4.20312	1.878963	120	4	0	4.97	SCT	4	1800	525.86	996
2024	4	3	12	87.8	75.2	66.35	2.10156	0.939481	60	2	0	3.11	SCT	4	2000	291.73	996
2024	4	3	13	89.6	75.2	62.68	3.15234	1.409222	20	3	0	3.73	SCT	4	2000	0	996
2024	4	3	14	89.6	73.4	59.01	3.15234	1.409222	240	3	0	3.73	SCT	4	2000	0	996
2024	4	3	15	91.4	73.4	55.77	2.10156	0.939481	60	2	0	4.35	SCT	4	2000	0	995
2024	4	3	16	93.2	62.6	36.35	3.15234	1.409222	220	3	0	4.35	SCT	4	2000	0	995
2024	4	3	17	95	62.6	34.39	3.15234	1.409222	120	3	0	4.97	SCT	4	2000	0	994.3333
2024	4	3	18	96.8	59	28.63	3.15234	1.409222	140	3	0	4.97	SCT	4	2000	0	994.3333
2024	4	3	19	98.6	55.4	23.81	4.20312	1.878963	200	4	0	4.97	SCT	4	2000	0	993.3333
2024	4	3	20	98.6	57.2	25.41	4.20312	1.878963	240	4	0	4.97	SCT	4	2000	0	992.3333
2024	4	3	21	100.4	55.4	22.54	3.15234	1.409222	80	3	0	4.97	SCT	4	2000	0	991.3333
2024	4	3	22	100.4	55.4	22.54	2.10156	0.939481	60	2	0	4.97	SCT	4	2000	0	990.3333
2024	4	3	23	102.2	50	17.51	4.20312	1.878963	320	4	0	4.97	SCT	4	2000	0	990.3333
2024	4	4	0	102.2	53.6	20	7.35546	3.288185	160	7	0	4.97	SCT	4	2000	0	990.3333
2024	4	4	1	102.2	53.6	20	6.30468	2.818444	120	6	0	4.97	SCT	4	2000	0	990.3333
2024	4	4	2	100.4	50	18.48	8.40624	3.757926	100	8	0	4.97	SCT	4	2000	30.94	990.3333
2024	4	4	3	98.6	51.8	20.87	9.45702	4.227666	110	9	0	4.97	SCT	4	2000	697.85	996
2024	4	4	4	84.2	75.2	74.44	2.10156	0.939481	60	2	0	3.11	SCT	4	1800	848.94	996
2024	4	4	5	86	73.4	66.15	3.15234	1.409222	180	3	0	3.11	SCT	4	2000	926.14	995
2024	4	4	6	89.6	71.6	55.53	4.20312	1.878963	120	4	0	3.11	SCT	4	2000	916.73	995
2024	4	4	7	91.4	69.8	49.36	6.30468	2.818444	200	6	0	3.73	SCT	4	2000	897.95	995
2024	4	4	8	93.2	66.2	41.23	7.35546	3.288185	200	7	0	3.73	SCT	4	2000	861.16	994.3333
2024	4	4	9	95	62.6	34.39	4.20312	1.878963	230	4	0	3.73	SCT	4	2000	807.62	993.3333
2024	4	4	10	95	62.6	34.39	3.15234	1.409222	30	3	0	3.73	SCT	4	2000	702.42	992.3333

2024	4	4	11	96.8	60.8	30.53	4.20312	1.878963	140	4	0	3.73	SCT	4	2000	525.86	991.3333
2024	4	4	12	100.4	59	25.67	6.30468	2.818444	310	6	0	4.35	SCT	4	2000	291.73	990.3333
2024	4	4	13	102.2	57.2	22.79	7.35546	3.288185	200	7	0	4.97	SCT	4	2000	0	990.3333
2024	4	4	14	102.2	55.4	21.36	8.40624	3.757926	170	8	0	4.97	SCT	4	2000	0	990.3333
2024	4	4	15	102.2	53.6	20	6.30468	2.818444	200	6	0	4.97	SCT	4	2000	0	989.3333
2024	4	4	16	102.2	48.2	16.37	10.5078	4.697407	140	10	0	4.97	SCT	4	2000	0	989.3333
2024	4	4	17	102.2	48.2	16.37	9.45702	4.227666	140	9	0	4.97	SCT	4	2000	0	989.3333
2024	4	4	18	100.4	46.4	16.15	7.35546	3.288185	120	7	0	4.97	SCT	4	2000	0	989.3333
2024	4	4	19	100.4	48.2	17.28	9.45702	4.227666	140	9	0	4.97	SCT	4	2000	0	994.3333
2024	4	4	20	75.2	60.8	60.9	2.10156	0.939481	60	2	0	2.49	SCT	4	2000	0	995
2024	4	4	21	80.6	59	47.79	4.20312	1.878963	230	4	0	2.8	SCT	4	2000	0	995
2024	4	4	22	84.2	59	42.52	4.20312	1.878963	230	4	0	3.11	SCT	4	2000	0	995
2024	4	4	23	86	60.8	42.8	3.15234	1.409222	170	3	0	3.11	SCT	4	2000	0	995
2024	4	5	0	87.8	62.6	43.07	2.10156	0.939481	60	2	0	3.11	SCT	4	2000	0	995
2024	4	5	1	89.6	62.6	40.69	3.15234	1.409222	210	3	0	3.11	SCT	4	2000	0	995
2024	4	5	2	93.2	55.4	28.1	3.15234	1.409222	140	3	0	3.11	SCT	4	2000	30.94	994.3333
2024	4	5	3	95	53.6	24.89	6.30468	2.818444	250	6	0	3.73	SCT	4	2000	697.85	994.3333
2024	4	5	4	96.8	51.8	22.04	6.30468	2.818444	180	6	0	3.73	SCT	4	2000	848.94	993.3333
2024	4	5	5	98.6	44.6	15.93	4.20312	1.878963	160	4	0	3.73	SCT	4	2000	926.14	992.3333
2024	4	5	6	98.6	50	19.52	5.2539	2.348703	230	5	0	3.73	SCT	4	2000	916.73	992.3333
2024	4	5	7	98.6	51.8	20.87	4.20312	1.878963	170	4	0	3.73	SCT	4	2000	897.95	990.3333
2024	4	5	8	100.4	50	18.48	4.20312	1.878963	250	4	0	3.73	SCT	4	2000	861.16	989.3333
2024	4	5	9	102.2	64.4	29.43	4.20312	1.878963	250	4	0	4.35	SCT	4	2000	807.62	989.3333
2024	4	5	10	102.2	42.8	13.34	4.20312	1.878963	170	4	0	4.97	SCT	4	2000	702.42	989.3333
2024	4	5	11	102.2	42.8	13.34	6.30468	2.818444	150	6	0	4.97	SCT	4	2000	525.86	989.3333
2024	4	5	12	100.4	42.8	14.08	5.2539	2.348703	120	5	0	4.97	SCT	4	2000	291.73	989.3333
2024	4	5	13	98.6	42.8	14.87	6.30468	2.818444	110	6	0	4.97	SCT	4	2000	0	994.3333
2024	4	5	14	78.8	57.2	47.52	2.10156	0.939481	60	2	0	2.8	SCT	4	2000	0	994.3333
2024	4	5	15	80.6	59	47.79	2.10156	0.939481	60	2	0	3.11	SCT	4	2000	0	995
2024	4	5	16	86	57.2	37.62	2.10156	0.939481	60	2	0	3.11	SCT	4	2000	0	995
2024	4	5	17	86	66.2	51.72	2.10156	0.939481	60	2	0	3.11	SCT	4	2000	0	995
2024	4	5	18	87.8	64.4	45.88	2.10156	0.939481	60	2	0	3.11	SCT	4	2000	0	995

2024	4	5	19	89.6	64.4	43.34	2.10156	0.939481	60	2	0	3.73	SCT	4	2000	0	995
2024	4	5	20	91.4	57.2	31.72	6.30468	2.818444	150	6	0	3.73	SCT	4	2000	0	995
2024	4	5	21	93.2	53.6	26.31	4.20312	1.878963	180	4	0	3.73	SCT	4	2000	0	995
2024	4	5	22	95	42.8	16.6	4.20312	1.878963	140	4	0	3.73	SCT	4	2000	0	995
2024	4	5	23	95	44.6	17.78	3.15234	1.409222	120	3	0	4.35	SCT	4	2000	0	994.3333
2024	4	6	0	96.8	48.2	19.28	7.35546	3.288185	180	7	0	4.35	SCT	4	2000	0	993.3333
2024	4	6	1	98.6	48.2	18.25	6.30468	2.818444	150	6	0	4.35	SCT	4	2000	0	993.3333
2024	4	6	2	98.6	46.4	17.05	4.20312	1.878963	210	4	0	4.35	SCT	4	2000	30.94	992.3333
2024	4	6	3	100.4	37.4	11.41	7.35546	3.288185	160	7	0	4.97	SCT	4	2000	697.85	992.3333
2024	4	6	4	102.2	33.8	9.37	4.20312	1.878963	200	4	0	4.97	SCT	4	2000	848.94	991.3333
2024	4	6	5	102.2	35.6	10.07	3.15234	1.409222	160	3	0	4.97	SCT	4	1800	926.14	991.3333
2024	4	6	6	102.2	35.6	10.07	3.15234	1.409222	100	3	0	4.97	SCT	4	1800	916.73	991.3333
2024	4	6	7	102.2	39.2	11.6	8.40624	3.757926	110	8	0	4.97	SCT	4	1800	897.95	991.3333
2024	4	6	8	100.4	41	13.14	7.35546	3.288185	100	7	0	4.97	SCT	4	1800	861.16	991.3333
2024	4	6	9	100.4	44.6	15.08	6.30468	2.818444	100	6	0	4.97	FEW	2	1000	807.62	991.3333
2024	4	6	10	100.4	48.2	17.28	8.40624	3.757926	120	8	0	4.97	FEW	2	1000	702.42	991.3333
2024	4	6	11	98.6	48.2	18.25	10.5078	4.697407	110	10	0	4.97	FEW	2	1000	525.86	991.3333
2024	4	6	12	98.6	48.2	18.25	10.5078	4.697407	110	10	0	4.97	FEW	2	1000	291.73	997
2024	4	6	13	82.4	69.8	65.74	4.20312	1.878963	60	4	0	3.11	FEW	2	1000	0	997
2024	4	6	14	86	69.8	58.55	3.15234	1.409222	150	3	0	3.11	SCT	4	2000	0	997
2024	4	6	15	89.6	60.8	38.18	5.2539	2.348703	120	5	0	3.11	SCT	4	2000	0	996
2024	4	6	16	91.4	60.8	36.08	3.15234	1.409222	150	3	0	3.73	SCT	4	2000	0	996
2024	4	6	17	91.4	62.6	38.45	4.20312	1.878963	160	4	0	3.73	SCT	4	2000	0	995
2024	4	6	18	91.4	60.8	36.08	5.2539	2.348703	200	5	0	3.73	FEW	2	1500	0	995
2024	4	6	19	95	57.2	28.37	4.20312	1.878963	180	4	0	3.73	FEW	2	1500	0	994.3333
2024	4	6	20	96.8	51.8	22.04	8.40624	3.757926	120	8	0	3.73	FEW	2	1500	0	993.3333
2024	4	6	21	96.8	51.8	22.04	8.40624	3.757926	140	8	0	4.35	FEW	2	1500	0	993.3333
2024	4	6	22	98.6	51.8	20.87	7.35546	3.288185	170	7	0	4.35	SCT	4	2000	0	992.3333
2024	4	6	23	98.6	55.4	23.81	5.2539	2.348703	190	5	0	4.35	SCT	4	2000	0	992.3333
2024	4	7	0	98.6	59	27.1	10.5078	4.697407	110	10	0	4.35	SCT	4	2000	0	991.3333
2024	4	7	1	96.8	59	28.63	10.5078	4.697407	100	10	0	4.35	SCT	4	2000	0	991.3333
2024	4	7	2	96.8	60.8	30.53	7.35546	3.288185	110	7	0	4.35	SCT	4	2000	30.94	991.3333

2024	4	7	3	95	60.8	32.27	10.5078	4.697407	120	10	0	4.35	FEW	2	1500	697.85	992.3333
2024	4	7	4	93.2	60.8	34.11	10.5078	4.697407	110	10	0	3.73	FEW	2	1500	848.94	997
2024	4	7	5	80.6	71.6	74.11	3.15234	1.409222	220	3	0	3.11	FEW	2	1500	926.14	998
2024	4	7	6	82.4	71.6	69.9	3.15234	1.409222	240	3	0	3.11	FEW	2	1500	916.73	997
2024	4	7	7	86	68	55.04	3.15234	1.409222	120	3	0	3.11	FEW	2	1500	897.95	997
2024	4	7	8	86	68	55.04	4.20312	1.878963	250	4	0	3.11	FEW	2	1500	861.16	996
2024	4	7	9	87.8	66.2	48.84	4.20312	1.878963	190	4	0	3.11	SCT	4	2000	807.62	996
2024	4	7	10	89.6	64.4	43.34	3.15234	1.409222	140	3	0	3.11	SCT	4	2000	702.42	995
2024	4	7	11	89.6	64.4	43.34	3.15234	1.409222	110	3	0	3.11	SCT	4	2000	525.86	995
2024	4	7	12	93.2	64.4	38.73	3.15234	1.409222	240	3	0	3.11	SCT	4	2000	291.73	994.3333
2024	4	7	13	95	62.6	34.39	4.20312	1.878963	40	4	0	3.11	SCT	4	2000	0	993.3333
2024	4	7	14	95	57.2	28.37	3.15234	1.409222	200	3	0	3.73	SCT	4	2000	0	993.3333
2024	4	7	15	96.8	55.4	25.15	3.15234	1.409222	40	3	0	3.73	SCT	4	2000	0	992.3333
2024	4	7	16	98.6	57.2	25.41	6.30468	2.818444	70	6	0	3.73	SCT	4	2000	0	991.3333
2024	4	7	17	98.6	55.4	23.81	8.40624	3.757926	130	8	0	4.35	SCT	4	2000	0	991.3333
2024	4	7	18	98.6	55.4	23.81	10.5078	4.697407	100	10	0	4.35	SCT	4	2000	0	991.3333
2024	4	7	19	96.8	57.2	26.84	8.40624	3.757926	120	8	0	4.35	SCT	4	2000	0	991.3333
2024	4	7	20	96.8	59	28.63	10.5078	4.697407	100	10	0	4.35	SCT	4	2000	0	991.3333
2024	4	7	21	95	59	30.26	10.5078	4.697407	120	10	0	4.35	SCT	4	2000	0	998
2024	4	7	22	84.2	69.8	62.03	3.15234	1.409222	310	3	0	3.11	SCT	4	2000	0	998
2024	4	7	23	86	69.8	58.55	4.20312	1.878963	310	4	0	3.11	SCT	4	2000	0	997
2024	4	8	0	89.6	68	49.1	4.20312	1.878963	190	4	0	3.11	SCT	4	2000	0	997
2024	4	8	1	91.4	62.6	38.45	4.20312	1.878963	140	4	0	3.11	SCT	4	2000	0	996
2024	4	8	2	93.2	59	31.99	8.40624	3.757926	150	8	0	3.11	SCT	4	2000	30.94	996
2024	4	8	3	95	57.2	28.37	8.40624	3.757926	140	8	0	3.73	SCT	4	2000	697.85	995
2024	4	8	4	95	57.2	28.37	8.40624	3.757926	130	8	0	3.73	SCT	4	2000	848.94	994.3333
2024	4	8	5	95	59	30.26	8.40624	3.757926	110	8	0	4.35	SCT	4	2000	926.14	993.3333
2024	4	8	6	96.8	57.2	26.84	10.5078	4.697407	150	10	0	4.35	SCT	4	2000	916.73	993.3333
2024	4	8	7	98.6	59	27.1	10.5078	4.697407	150	10	0	4.35	SCT	4	2000	897.95	992.3333
2024	4	8	8	98.6	59	27.1	8.40624	3.757926	120	8	0	4.97	SCT	4	2000	861.16	992.3333
2024	4	8	9	100.4	59	25.67	8.40624	3.757926	170	8	0	4.97	SCT	4	2000	807.62	991.3333
2024	4	8	10	98.6	59	27.1	8.40624	3.757926	150	8	0	4.97	FEW	2	2000	702.42	991.3333

2024	4	8	11	98.6	60.8	28.9	7.35546	3.288185	140	7	0	4.97	SCT	4	2000	525.86	991.3333
2024	4	8	12	98.6	60.8	28.9	7.35546	3.288185	150	7	0	4.97	SCT	4	2000	291.73	991.3333
2024	4	8	13	96.8	62.6	32.54	8.40624	3.757926	120	8	0	4.97	SCT	4	2000	0	997
2024	4	8	14	86	71.6	62.25	4.20312	1.878963	230	4	0	3.11	SCT	4	2000	0	997
2024	4	8	15	87.8	69.8	55.29	4.20312	1.878963	230	4	0	3.11	SCT	4	2000	0	997
2024	4	8	16	89.6	69.8	52.23	2.10156	0.939481	60	2	0	3.11	SCT	4	2000	0	997
2024	4	8	17	89.6	69.8	52.23	2.10156	0.939481	60	2	0	3.11	FEW	2	2000	0	996
2024	4	8	18	91.4	69.8	49.36	2.10156	0.939481	60	2	0	3.11	FEW	2	2000	0	996
2024	4	8	19	93.2	69.8	46.67	4.20312	1.878963	50	4	0	3.11	FEW	2	2000	0	995
2024	4	8	20	93.2	68	43.88	4.20312	1.878963	200	4	0	3.11	FEW	2	2000	0	995
2024	4	8	21	95	66.2	39	2.10156	0.939481	60	2	0	3.11	FEW	2	2000	0	994.3333
2024	4	8	22	95	66.2	39	3.15234	1.409222	20	3	0	3.11	FEW	2	2000	0	994.3333
2024	4	8	23	93.2	66.2	41.23	3.15234	1.409222	60	3	0	3.11	FEW	2	2000	0	993.3333
2024	4	9	0	95	66.2	39	6.30468	2.818444	140	6	0	3.11	FEW	2	2000	0	992.3333
2024	4	9	1	96.8	64.4	34.66	3.15234	1.409222	230	3	0	3.11	FEW	2	2000	0	992.3333
2024	4	9	2	96.8	64.4	34.66	5.2539	2.348703	80	5	0	3.73	FEW	2	2000	30.94	991.3333
2024	4	9	3	98.6	62.6	30.8	4.20312	1.878963	140	4	0	4.35	FEW	2	2000	697.85	991.3333
2024	4	9	4	96.8	60.8	30.53	4.20312	1.878963	130	4	0	4.97	FEW	2	2000	848.94	991.3333
2024	4	9	5	95	62.6	34.39	8.40624	3.757926	120	8	0	4.97	FEW	2	2000	926.14	991.3333
2024	4	9	6	95	62.6	34.39	8.40624	3.757926	120	8	0	4.97	FEW	2	2000	916.73	997
2024	4	9	7	86	73.4	66.15	4.20312	1.878963	230	4	0	3.11	FEW	2	2000	897.95	997
2024	4	9	8	87.8	69.8	55.29	3.15234	1.409222	80	3	0	3.73	FEW	2	2000	861.16	997
2024	4	9	9	89.6	68	49.1	6.30468	2.818444	140	6	0	3.73	SCT	4	2000	807.62	997
2024	4	9	10	89.6	69.8	52.23	5.2539	2.348703	149	5	0	3.73	SCT	4	2000	702.42	996
2024	4	9	11	91.4	62.6	38.45	8.40624	3.757926	130	8	0	4.35	SCT	4	2000	525.86	996
2024	4	9	12	93.2	64.4	38.73	10.5078	4.697407	130	10	0	4.35	SCT	4	2000	291.73	995
2024	4	9	13	93.2	62.6	36.35	10.5078	4.697407	120	10	0	4.35	SCT	4	2000	0	995
2024	4	9	14	95	59	30.26	7.35546	3.288185	140	7	0	4.35	SCT	4	2000	0	994.3333
2024	4	9	15	96.8	59	28.63	7.35546	3.288185	140	7	0	4.97	SCT	4	2000	0	993.3333
2024	4	9	16	95	59	30.26	5.2539	2.348703	50	5	0	4.97	FEW	2	2000	0	993.3333
2024	4	9	17	95	60.8	32.27	6.30468	2.818444	110	6	0	4.97	FEW	2	2000	0	992.3333
2024	4	9	18	95	60.8	32.27	8.40624	3.757926	110	8	0	4.97	FEW	2	2000	0	992.3333

2024	4	9	19	93.2	66.2	41.23	4.20312	1.878963	160	4	0	4.97	SCT	4	2000	0	992.3333
2024	4	9	20	93.2	62.6	36.35	4.20312	1.878963	150	4	0	4.97	SCT	4	2000	0	992.3333
2024	4	9	21	86	66.2	51.72	10.5078	4.697407	140	10	0	3.11	SCT	4	2000	0	992.3333
2024	4	9	22	86	71.6	62.25	6.30468	2.818444	200	6	0	3.11	SCT	4	2000	0	992.3333
2024	4	9	23	86	71.6	62.25	4.20312	1.878963	120	4	0	3.11	SCT	4	2000	0	998
2024	4	10	0	82.4	71.6	69.9	3.15234	1.409222	40	3	0	3.11	SCT	4	2000	0	998
2024	4	10	1	86	71.6	62.25	3.15234	1.409222	280	3	0	3.11	SCT	4	2000	0	998
2024	4	10	2	87.8	69.8	55.29	3.15234	1.409222	330	3	0	3.11	SCT	4	2000	30.94	998
2024	4	10	3	89.6	68	49.1	3.15234	1.409222	327	3	0	3.11	SCT	4	2000	697.85	997
2024	4	10	4	89.6	66.2	46.14	3.15234	1.409222	280	3	0	3.11	SCT	4	2000	848.94	997
2024	4	10	5	89.6	64.4	43.34	3.15234	1.409222	160	3	0	3.11	SCT	4	2000	926.14	997
2024	4	10	6	91.4	64.4	40.96	6.30468	2.818444	110	6	0	3.73	SCT	4	2000	916.73	996
2024	4	10	7	93.2	62.6	36.35	5.2539	2.348703	130	5	0	3.73	SCT	4	2000	897.95	994.3333
2024	4	10	8	95	62.6	34.39	5.2539	2.348703	180	5	0	4.35	SCT	4	2000	861.16	993.3333
2024	4	10	9	96.8	60.8	30.53	4.20312	1.878963	130	4	0	4.35	SCT	4	2000	807.62	992.3333
2024	4	10	10	98.6	59	27.1	8.40624	3.757926	120	8	0	4.35	SCT	4	2000	702.42	992.3333
2024	4	10	11	96.8	57.2	26.84	8.40624	3.757926	120	8	0	4.97	SCT	4	2000	525.86	992.3333
2024	4	10	12	96.8	57.2	26.84	10.5078	4.697407	110	10	0	4.97	SCT	4	2000	291.73	992.3333
2024	4	10	13	96.8	59	28.63	10.5078	4.697407	100	10	0	4.97	SCT	4	2000	0	992.3333
2024	4	10	14	95	59	30.26	10.5078	4.697407	110	10	0	4.97	SCT	4	2000	0	998
2024	4	10	15	82.4	64.4	54.55	3.15234	1.409222	290	3	0	3.73	SCT	4	2000	0	998
2024	4	10	16	87.8	62.6	43.07	3.15234	1.409222	20	3	0	3.73	SCT	4	2000	0	998
2024	4	10	17	87.8	62.6	43.07	3.15234	1.409222	230	3	0	3.73	SCT	4	2000	0	998
2024	4	10	18	87.8	60.8	40.41	3.15234	1.409222	340	3	0	3.73	SCT	4	2000	0	998
2024	4	10	19	91.4	60.8	36.08	3.15234	1.409222	110	3	0	4.35	SCT	4	2000	0	997
2024	4	10	20	93.2	60.8	34.11	3.15234	1.409222	210	3	0	4.35	SCT	4	2000	0	997
2024	4	10	21	93.2	62.6	36.35	3.15234	1.409222	270	3	0	4.35	SCT	4	2000	0	996
2024	4	10	22	95	60.8	32.27	5.2539	2.348703	50	5	0	4.35	SCT	4	2000	0	995
2024	4	10	23	96.8	59	28.63	5.2539	2.348703	70	5	0	4.35	SCT	4	2000	0	995
2024	4	11	0	96.8	60.8	30.53	7.35546	3.288185	100	7	0	4.35	SCT	4	2000	0	994.3333
2024	4	11	1	96.8	60.8	30.53	7.35546	3.288185	120	7	0	4.35	SCT	4	2000	0	993.3333
2024	4	11	2	98.6	60.8	28.9	10.5078	4.697407	100	10	0	4.97	SCT	4	2000	30.94	992.3333

2024	4	11	3	96.8	60.8	30.53	10.5078	4.697407	130	10	0	4.97	SCT	4	2000	697.85	992.3333
2024	4	11	4	96.8	60.8	30.53	10.5078	4.697407	140	10	0	4.97	SCT	4	2000	848.94	992.3333
2024	4	11	5	96.8	60.8	30.53	10.5078	4.697407	120	10	0	4.97	SCT	4	2000	926.14	992.3333
2024	4	11	6	95	60.8	32.27	10.5078	4.697407	130	10	0	4.97	SCT	4	2000	916.73	993.3333
2024	4	11	7	95	62.6	34.39	10.5078	4.697407	120	10	0	4.97	SCT	4	2000	897.95	993.3333
2024	4	11	8	86	73.4	66.15	3.15234	1.409222	190	3	0	3.11	SCT	4	2000	861.16	994.3333
2024	4	11	9	89.6	73.4	59.01	2.10156	0.939481	60	2	0	3.11	SCT	4	2000	807.62	993.3333
2024	4	11	10	91.4	73.4	55.77	4.20312	1.878963	230	4	0	3.11	SCT	4	2000	702.42	993.3333
2024	4	11	11	93.2	73.4	52.73	4.20312	1.878963	240	4	0	3.11	SCT	4	2000	525.86	992.3333
2024	4	11	12	95	71.6	46.93	2.10156	0.939481	70	2	0	3.11	SCT	4	2000	291.73	992.3333
2024	4	11	13	95	71.6	46.93	7.35546	3.288185	170	7	0	3.11	SCT	4	2000	0	991.3333
2024	4	11	14	96.8	68	39.27	4.20312	1.878963	150	4	0	3.11	SCT	4	2000	0	991.3333
2024	4	11	15	98.6	68	37.17	6.30468	2.818444	170	6	0	3.11	SCT	4	2000	0	990.3333
2024	4	11	16	98.6	66.2	34.93	4.20312	1.878963	200	4	0	3.73	SCT	4	2000	0	989.3333
2024	4	11	17	100.4	64.4	31.07	3.15234	1.409222	70	3	0	3.73	SCT	4	2000	0	988.3333
2024	4	11	18	102.2	62.6	27.63	5.2539	2.348703	220	5	0	3.73	SCT	4	2000	0	988.3333
2024	4	11	19	100.4	64.4	31.07	7.35546	3.288185	10	7	0	3.73	SCT	4	2000	0	988.3333
2024	4	11	20	87.8	68	51.98	12.6094	5.636888	230	12	0	3.11	SCT	4	2000	0	988.3333
2024	4	11	21	87.8	73.4	62.47	7.35546	3.288185	180	7	0	3.73	SCT	4	2000	0	987.3333
2024	4	11	22	89.6	71.6	55.53	2.10156	0.939481	70	2	0	3.73	SCT	4	2000	0	987.3333
2024	4	11	23	89.6	75.2	62.68	2.10156	0.939481	70	2	0	3.73	SCT	4	2000	0	987.3333
2024	4	12	0	89.6	71.6	55.53	2.10156	0.939481	70	2	0	3.73	SCT	4	2000	0	994.3333
2024	4	12	1	86	77	74.61	4.20312	1.878963	200	4	0	3.11	SCT	4	2000	0	994.3333
2024	4	12	2	89.6	75.2	62.68	3.15234	1.409222	180	3	0	3.11	SCT	4	2000	30.94	993.3333
2024	4	12	3	91.4	77	62.9	3.15234	1.409222	210	3	0	3.11	SCT	4	2000	697.85	993.3333
2024	4	12	4	93.2	75.2	56.01	5.2539	2.348703	220	5	0	3.11	SCT	4	2000	848.94	992.3333
2024	4	12	5	93.2	75.2	56.01	3.15234	1.409222	230	3	0	3.11	SCT	4	2000	926.14	992.3333
2024	4	12	6	93.2	75.2	56.01	3.15234	1.409222	210	3	0	3.11	SCT	4	2000	916.73	992.3333
2024	4	12	7	95	71.6	46.93	2.10156	0.939481	70	2	0	3.11	SCT	4	2000	897.95	991.3333
2024	4	12	8	96.8	69.8	41.77	4.20312	1.878963	70	4	0	3.11	SCT	4	2000	861.16	990.3333
2024	4	12	9	96.8	68	39.27	3.15234	1.409222	90	3	0	3.11	SCT	4	2000	807.62	989.3333
2024	4	12	10	98.6	68	37.17	5.2539	2.348703	220	5	0	3.11	SCT	4	2000	702.42	989.3333

2024	4	12	11	98.6	68	37.17	4.20312	1.878963	240	4	0	3.73	SCT	4	2000	525.86	988.3333
2024	4	12	12	98.6	66.2	34.93	3.15234	1.409222	220	3	0	3.73	SCT	4	2000	291.73	989.3333
2024	4	12	13	95	75.2	52.98	13.6601	6.106629	30	13	0	3.11	SCT	4	2000	0	989.3333
2024	4	12	14	87.8	73.4	62.47	18.914	8.455332	360	18	0	2.49	SCT	4	2000	0	988.3333
2024	4	12	15	86	73.4	66.15	5.2539	2.348703	330	5	0	3.11	SCT	4	2000	0	988.3333
2024	4	12	16	87.8	77	70.45	4.20312	1.878963	20	4	0	3.73	SCT	4	2000	0	988.3333
2024	4	12	17	86	75.2	70.27	2.10156	0.939481	70	2	0	3.73	SCT	4	2000	0	988.3333
2024	4	12	18	87.8	77	70.45	2.10156	0.939481	70	2	0	3.73	SCT	4	2000	0	989.3333
2024	4	12	19	87.8	77	70.45	2.10156	0.939481	70	2	0	3.73	SCT	4	2000	0	994.3333
2024	4	12	20	86	75.2	70.27	5.2539	2.348703	120	5	0	3.11	SCT	4	2000	0	994.3333
2024	4	12	21	89.6	73.4	59.01	3.15234	1.409222	180	3	0	3.11	SCT	4	2000	0	994.3333
2024	4	12	22	91.4	73.4	55.77	2.10156	0.939481	70	2	0	3.11	SCT	4	2000	0	994.3333
2024	4	12	23	91.4	73.4	55.77	2.10156	0.939481	70	2	0	3.11	SCT	4	2000	0	993.3333
2024	4	13	0	93.2	71.6	49.62	4.20312	1.878963	150	4	0	3.11	SCT	4	2000	0	993.3333
2024	4	13	1	93.2	71.6	49.62	7.35546	3.288185	190	7	0	3.11	SCT	4	2000	0	992.3333
2024	4	13	2	95	69.8	44.14	2.10156	0.939481	70	2	0	3.11	SCT	4	2000	30.94	992.3333
2024	4	13	3	96.8	68	39.27	5.2539	2.348703	240	5	0	3.11	SCT	4	2000	697.85	990.3333
2024	4	13	4	96.8	66.2	36.9	4.20312	1.878963	170	4	0	3.73	SCT	4	2000	848.94	989.3333
2024	4	13	5	98.6	66.2	34.93	5.2539	2.348703	230	5	0	3.73	SCT	4	1800	926.14	989.3333
2024	4	13	6	100.4	62.6	29.17	2.10156	0.939481	70	2	0	3.73	SCT	4	1800	916.73	989.3333
2024	4	13	7	98.6	62.6	30.8	6.30468	2.818444	60	6	0	3.73	SCT	4	2000	897.95	989.3333
2024	4	13	8	98.6	62.6	30.8	6.30468	2.818444	120	6	0	3.73	SCT	4	2000	861.16	989.3333
2024	4	13	9	98.6	57.2	25.41	7.35546	3.288185	100	7	0	3.73	SCT	4	2000	807.62	989.3333
2024	4	13	10	98.6	55.4	23.81	6.30468	2.818444	100	6	0	3.73	SCT	4	2000	702.42	995
2024	4	13	11	86	71.6	62.25	4.20312	1.878963	210	4	0	3.11	SCT	4	2000	525.86	995
2024	4	13	12	89.6	71.6	55.53	4.20312	1.878963	180	4	0	3.11	SCT	4	2000	291.73	995
2024	4	13	13	91.4	68	46.41	4.20312	1.878963	160	4	0	3.73	SCT	4	2000	0	995
2024	4	13	14	91.4	68	46.41	3.15234	1.409222	160	3	0	3.73	SCT	4	2000	0	994.3333
2024	4	13	15	93.2	66.2	41.23	3.15234	1.409222	270	3	0	3.73	SCT	4	2000	0	994.3333
2024	4	13	16	95	66.2	39	3.15234	1.409222	90	3	0	3.73	SCT	4	2000	0	993.3333
2024	4	13	17	95	66.2	39	3.15234	1.409222	160	3	0	4.35	SCT	4	2000	0	993.3333
2024	4	13	18	96.8	64.4	34.66	5.2539	2.348703	210	5	0	4.35	SCT	4	2000	0	992.3333

2024	4	13	19	98.6	66.2	34.93	4.20312	1.878963	220	4	0	4.35	SCT	4	2000	0	990.3333
2024	4	13	20	102.2	57.2	22.79	5.2539	2.348703	70	5	0	4.97	SCT	4	2000	0	991.3333
2024	4	13	21	100.4	62.6	29.17	6.30468	2.818444	160	6	0	4.97	SCT	4	2000	0	989.3333
2024	4	13	22	102.2	57.2	22.79	6.30468	2.818444	180	6	0	4.97	SCT	4	2000	0	989.3333
2024	4	13	23	104	53.6	18.95	3.15234	1.409222	110	3	0	4.97	SCT	4	2000	0	989.3333
2024	4	14	0	102.2	55.4	21.36	7.35546	3.288185	90	7	0	4.97	SCT	4	2000	0	989.3333
2024	4	14	1	102.2	55.4	21.36	6.30468	2.818444	130	6	0	4.97	SCT	4	2000	0	989.3333
2024	4	14	2	100.4	55.4	22.54	7.35546	3.288185	100	7	0	4.97	SCT	4	2000	30.94	994.3333
2024	4	14	3	87.8	75.2	66.35	3.15234	1.409222	110	3	0	3.11	SCT	4	1800	697.85	994.3333
2024	4	14	4	89.6	75.2	62.68	6.30468	2.818444	200	6	0	3.11	SCT	4	1800	848.94	994.3333
2024	4	14	5	91.4	68	46.41	5.2539	2.348703	130	5	0	3.73	SCT	4	1800	926.14	993.3333
2024	4	14	6	93.2	68	43.88	6.30468	2.818444	160	6	0	3.73	SCT	4	1800	916.73	993.3333
2024	4	14	7	95	66.2	39	5.2539	2.348703	200	5	0	3.73	SCT	4	1800	897.95	992.3333
2024	4	14	8	96.8	62.6	32.54	5.2539	2.348703	240	5	0	4.35	SCT	4	1800	861.16	992.3333
2024	4	14	9	96.8	59	28.63	3.15234	1.409222	120	3	0	4.35	SCT	4	1800	807.62	991.3333
2024	4	14	10	98.6	53.6	22.29	3.15234	1.409222	170	3	0	4.35	SCT	4	2000	702.42	990.3333
2024	4	14	11	100.4	48.2	17.28	4.20312	1.878963	220	4	0	4.97	SCT	4	2000	525.86	990.3333
2024	4	14	12	102.2	42.8	13.34	5.2539	2.348703	220	5	0	4.97	SCT	4	2000	291.73	989.3333
2024	4	14	13	104	42.8	12.64	8.40624	3.757926	160	8	0	4.97	SCT	4	2000	0	988.3333
2024	4	14	14	102.2	42.8	13.34	8.40624	3.757926	140	8	0	4.97	SCT	4	2000	0	988.3333
2024	4	14	15	102.2	46.4	15.3	10.5078	4.697407	120	10	0	4.97	SCT	4	2000	0	988.3333
2024	4	14	16	100.4	46.4	16.15	10.5078	4.697407	120	10	0	4.97	SCT	4	2000	0	994.3333
2024	4	14	17	86	68	55.04	4.20312	1.878963	230	4	0	3.73	SCT	4	2000	0	994.3333
2024	4	14	18	89.6	66.2	46.14	3.15234	1.409222	100	3	0	3.73	SCT	4	2000	0	994.3333
2024	4	14	19	89.6	64.4	43.34	4.20312	1.878963	130	4	0	4.35	SCT	4	2000	0	994.3333
2024	4	14	20	91.4	66.2	43.61	4.20312	1.878963	260	4	0	4.35	SCT	4	2000	0	993.3333
2024	4	14	21	93.2	60.8	34.11	5.2539	2.348703	220	5	0	4.35	SCT	4	2000	0	993.3333
2024	4	14	22	95	59	30.26	4.20312	1.878963	240	4	0	4.35	SCT	4	2000	0	992.3333
2024	4	14	23	95	57.2	28.37	4.20312	1.878963	170	4	0	4.35	SCT	4	2000	0	992.3333
2024	4	15	0	96.8	57.2	26.84	6.30468	2.818444	160	6	0	4.35	SCT	4	2000	0	991.3333
2024	4	15	1	98.6	55.4	23.81	10.5078	4.697407	160	10	0	4.35	SCT	4	2000	0	991.3333
2024	4	15	2	100.4	53.6	21.11	5.2539	2.348703	140	5	0	4.97	SCT	4	1800	30.94	989.3333

2024	4	15	3	100.4	53.6	21.11	7.35546	3.288185	90	7	0	4.97	SCT	4	2000	697.85	989.3333
2024	4	15	4	102.2	48.2	16.37	8.40624	3.757926	110	8	0	4.97	SCT	4	2000	848.94	989.3333
2024	4	15	5	102.2	48.2	16.37	10.5078	4.697407	110	10	0	4.97	SCT	4	2000	926.14	988.3333
2024	4	15	6	100.4	50	18.48	10.5078	4.697407	110	10	0	4.97	SCT	4	2000	916.73	988.3333
2024	4	15	7	100.4	50	18.48	10.5078	4.697407	100	10	0	4.97	SCT	4	2000	897.95	989.3333
2024	4	15	8	98.6	51.8	20.87	10.5078	4.697407	100	10	0	4.97	SCT	4	2000	861.16	994.3333
2024	4	15	9	87.8	62.6	43.07	3.15234	1.409222	260	3	0	3.73	SCT	4	2000	807.62	994.3333
2024	4	15	10	91.4	64.4	40.96	3.15234	1.409222	350	3	0	3.73	SCT	4	2000	702.42	993.3333
2024	4	15	11	93.2	64.4	38.73	3.15234	1.409222	350	3	0	3.73	SCT	4	2000	525.86	993.3333
2024	4	15	12	93.2	66.2	41.23	4.20312	1.878963	140	4	0	3.73	SCT	4	2000	291.73	993.3333
2024	4	15	13	95	64.4	36.63	5.2539	2.348703	160	5	0	3.73	SCT	4	2000	0	992.3333
2024	4	15	14	96.8	64.4	34.66	5.2539	2.348703	140	5	0	3.73	SCT	4	2000	0	992.3333
2024	4	15	15	98.6	64.4	32.81	4.20312	1.878963	220	4	0	4.35	SCT	4	2000	0	991.3333
2024	4	15	16	98.6	60.8	28.9	4.20312	1.878963	270	4	0	4.35	SCT	4	2000	0	990.3333
2024	4	15	17	100.4	60.8	27.37	5.2539	2.348703	280	5	0	4.35	SCT	4	2000	0	989.3333
2024	4	15	18	102.2	55.4	21.36	7.35546	3.288185	100	7	0	4.35	SCT	4	2000	0	989.3333
2024	4	15	19	102.2	53.6	20	8.40624	3.757926	110	8	0	4.97	SCT	4	2000	0	989.3333
2024	4	15	20	100.4	55.4	22.54	8.40624	3.757926	140	8	0	4.97	SCT	4	2000	0	989.3333
2024	4	15	21	100.4	53.6	21.11	10.5078	4.697407	130	10	0	4.97	SCT	4	2000	0	988.3333
2024	4	15	22	100.4	57.2	24.06	10.5078	4.697407	110	10	0	4.97	SCT	4	2000	0	989.3333
2024	4	15	23	100.4	57.2	24.06	10.5078	4.697407	120	10	0	4.97	SCT	4	2000	0	989.3333
2024	4	16	0	98.6	57.2	25.41	10.5078	4.697407	100	10	0	4.97	SCT	4	2000	0	994.3333
2024	4	16	1	86	73.4	66.15	4.20312	1.878963	230	4	0	3.11	SCT	4	2000	0	994.3333
2024	4	16	2	89.6	69.8	52.23	3.15234	1.409222	290	3	0	3.11	SCT	4	2000	30.94	994.3333
2024	4	16	3	91.4	69.8	49.36	5.2539	2.348703	190	5	0	3.11	SCT	4	2000	697.85	993.3333
2024	4	16	4	91.4	69.8	49.36	4.20312	1.878963	210	4	0	3.11	SCT	4	2000	848.94	993.3333
2024	4	16	5	93.2	69.8	46.67	3.15234	1.409222	140	3	0	3.11	SCT	4	2000	926.14	993.3333
2024	4	16	6	95	66.2	39	5.2539	2.348703	170	5	0	3.11	SCT	4	2000	916.73	992.3333
2024	4	16	7	95	66.2	39	5.2539	2.348703	160	5	0	3.11	SCT	4	2000	897.95	992.3333
2024	4	16	8	98.6	59	27.1	7.35546	3.288185	150	7	0	3.73	SCT	4	2000	861.16	991.3333
2024	4	16	9	100.4	50	18.48	10.5078	4.697407	130	10	0	3.73	SCT	4	2000	807.62	990.3333
2024	4	16	10	102.2	51.8	18.72	13.6601	6.106629	130	13	0	4.35	SCT	4	2000	702.42	990.3333

2024	4	16	11	102.2	48.2	16.37	14.7109	6.57637	130	14	0	4.35	SCT	4	2000	525.86	990.3333
2024	4	16	12	102.2	48.2	16.37	13.6601	6.106629	110	13	0	4.35	SCT	4	2000	291.73	989.3333
2024	4	16	13	102.2	51.8	18.72	9.45702	4.227666	130	9	0	4.35	SCT	4	2000	0	988.3333
2024	4	16	14	102.2	53.6	20	10.5078	4.697407	100	10	0	4.97	SCT	4	2000	0	988.3333
2024	4	16	15	100.4	53.6	21.11	10.5078	4.697407	120	10	0	4.97	SCT	4	2000	0	989.3333
2024	4	16	16	100.4	51.8	19.76	12.6094	5.636888	130	12	0	4.97	SCT	4	2000	0	989.3333
2024	4	16	17	98.6	50	19.52	10.5078	4.697407	100	10	0	4.97	SCT	4	2000	0	994.3333
2024	4	16	18	84.2	71.6	65.95	3.15234	1.409222	210	3	0	3.11	SCT	4	2000	0	994.3333
2024	4	16	19	87.8	71.6	58.78	3.15234	1.409222	160	3	0	3.11	SCT	4	2000	0	994.3333
2024	4	16	20	93.2	69.8	46.67	2.10156	0.939481	70	2	0	3.11	SCT	4	2000	0	993.3333
2024	4	16	21	91.4	68	46.41	3.15234	1.409222	130	3	0	3.11	SCT	4	2000	0	993.3333
2024	4	16	22	95	66.2	39	2.10156	0.939481	70	2	0	3.11	SCT	4	2000	0	992.3333
2024	4	16	23	96.8	62.6	32.54	4.20312	1.878963	170	4	0	3.11	SCT	4	2000	0	992.3333
2024	4	17	0	96.8	62.6	32.54	3.15234	1.409222	210	3	0	3.11	SCT	4	2000	0	992.3333
2024	4	17	1	100.4	57.2	24.06	5.2539	2.348703	180	5	0	3.73	SCT	4	2000	0	991.3333
2024	4	17	2	100.4	53.6	21.11	4.20312	1.878963	200	4	0	4.35	SCT	4	2000	30.94	990.3333
2024	4	17	3	100.4	53.6	21.11	2.10156	0.939481	70	2	0	4.97	SCT	4	1800	697.85	990.3333
2024	4	17	4	102.2	51.8	18.72	2.10156	0.939481	70	2	0	4.97	SCT	4	1800	848.94	989.3333
2024	4	17	5	102.2	51.8	18.72	8.40624	3.757926	120	8	0	4.97	SCT	4	1800	926.14	989.3333
2024	4	17	6	102.2	51.8	18.72	10.5078	4.697407	100	10	0	4.97	SCT	4	1800	916.73	989.3333
2024	4	17	7	102.2	48.2	16.37	10.5078	4.697407	110	10	0	4.97	FEW	2	1000	897.95	989.3333
2024	4	17	8	100.4	51.8	19.76	8.40624	3.757926	120	8	0	4.97	FEW	2	1000	861.16	989.3333
2024	4	17	9	100.4	51.8	19.76	10.5078	4.697407	120	10	0	4.97	FEW	2	1000	807.62	994.3333
2024	4	17	10	86	68	55.04	2.10156	0.939481	70	2	0	3.11	FEW	2	1000	702.42	994.3333
2024	4	17	11	89.6	64.4	43.34	4.20312	1.878963	150	4	0	3.11	FEW	2	1000	525.86	994.3333
2024	4	17	12	89.6	59	35.81	4.20312	1.878963	200	4	0	3.73	SCT	4	2000	291.73	994.3333
2024	4	17	13	91.4	59	33.84	6.30468	2.818444	200	6	0	3.73	SCT	4	2000	0	994.3333
2024	4	17	14	91.4	60.8	36.08	5.2539	2.348703	210	5	0	3.73	SCT	4	2000	0	993.3333
2024	4	17	15	95	62.6	34.39	5.2539	2.348703	200	5	0	3.73	SCT	4	2000	0	993.3333
2024	4	17	16	96.8	57.2	26.84	7.35546	3.288185	120	7	0	3.73	FEW	2	1500	0	992.3333
2024	4	17	17	96.8	55.4	25.15	8.40624	3.757926	180	8	0	3.73	FEW	2	1500	0	991.3333
2024	4	17	18	100.4	55.4	22.54	4.20312	1.878963	140	4	0	3.73	FEW	2	1500	0	990.3333

2024	4	17	19	100.4	53.6	21.11	6.30468	2.818444	100	6	0	3.73	FEW	2	1500	0	989.3333
2024	4	17	20	100.4	55.4	22.54	6.30468	2.818444	180	6	0	3.73	SCT	4	2000	0	989.3333
2024	4	17	21	102.2	55.4	21.36	7.35546	3.288185	210	7	0	3.73	SCT	4	2000	0	989.3333
2024	4	17	22	100.4	55.4	22.54	4.20312	1.878963	160	4	0	3.73	SCT	4	2000	0	989.3333
2024	4	17	23	100.4	55.4	22.54	4.20312	1.878963	180	4	0	3.73	SCT	4	2000	0	989.3333
2024	4	18	0	100.4	57.2	24.06	6.30468	2.818444	130	6	0	3.73	SCT	4	2000	0	996
2024	4	18	1	86	73.4	66.15	5.2539	2.348703	130	5	0	3.73	FEW	2	1500	0	996
2024	4	18	2	89.6	71.6	55.53	7.35546	3.288185	180	7	0	4.35	FEW	2	1500	30.94	996
2024	4	18	3	89.6	69.8	52.23	5.2539	2.348703	190	5	0	4.35	FEW	2	1500	697.85	996
2024	4	18	4	91.4	66.2	43.61	8.40624	3.757926	130	8	0	4.35	FEW	2	1500	848.94	996
2024	4	18	5	95	60.8	32.27	5.2539	2.348703	150	5	0	4.35	FEW	2	1500	926.14	995
2024	4	18	6	95	64.4	36.63	3.15234	1.409222	50	3	0	4.35	FEW	2	1500	916.73	995
2024	4	18	7	96.8	66.2	36.9	5.2539	2.348703	210	5	0	4.35	SCT	4	2000	897.95	994.3333
2024	4	18	8	96.8	62.6	32.54	5.2539	2.348703	220	5	0	4.97	SCT	4	2000	861.16	993.3333
2024	4	18	9	98.6	57.2	25.41	5.2539	2.348703	110	5	0	4.97	SCT	4	2000	807.62	992.3333
2024	4	18	10	100.4	53.6	21.11	4.20312	1.878963	190	4	0	4.97	SCT	4	2000	702.42	992.3333
2024	4	18	11	100.4	53.6	21.11	4.20312	1.878963	120	4	0	4.97	SCT	4	2000	525.86	991.3333
2024	4	18	12	102.2	51.8	18.72	4.20312	1.878963	110	4	0	4.97	SCT	4	2000	291.73	990.3333
2024	4	18	13	102.2	53.6	20	5.2539	2.348703	150	5	0	4.97	SCT	4	2000	0	990.3333
2024	4	18	14	102.2	53.6	20	4.20312	1.878963	160	4	0	4.97	SCT	4	2000	0	990.3333
2024	4	18	15	102.2	51.8	18.72	5.2539	2.348703	170	5	0	4.97	SCT	4	2000	0	989.3333
2024	4	18	16	102.2	48.2	16.37	4.20312	1.878963	180	4	0	4.97	SCT	4	2000	0	989.3333
2024	4	18	17	102.2	50	17.51	4.20312	1.878963	140	4	0	4.97	SCT	4	2000	0	990.3333
2024	4	18	18	102.2	50	17.51	4.20312	1.878963	130	4	0	4.97	SCT	4	2000	0	995
2024	4	18	19	87.8	75.2	66.35	5.2539	2.348703	140	5	0	3.73	SCT	4	2000	0	995
2024	4	18	20	89.6	75.2	62.68	4.20312	1.878963	280	4	0	3.73	SCT	4	2000	0	994.3333
2024	4	18	21	89.6	73.4	59.01	4.20312	1.878963	210	4	0	4.35	SCT	4	2000	0	994.3333
2024	4	18	22	91.4	71.6	52.48	4.20312	1.878963	200	4	0	4.35	SCT	4	2000	0	994.3333
2024	4	18	23	93.2	71.6	49.62	6.30468	2.818444	220	6	0	4.35	SCT	4	2000	0	993.3333
2024	4	19	0	95	71.6	46.93	5.2539	2.348703	210	5	0	4.97	SCT	4	2000	0	992.3333
2024	4	19	1	96.8	69.8	41.77	7.35546	3.288185	170	7	0	4.97	SCT	4	2000	0	992.3333
2024	4	19	2	96.8	68	39.27	8.40624	3.757926	210	8	0	4.97	SCT	4	2000	30.94	991.3333

2024	4	19	3	98.6	66.2	34.93	7.35546	3.288185	220	7	0	4.97	SCT	4	2000	697.85	990.3333
2024	4	19	4	98.6	66.2	34.93	5.2539	2.348703	130	5	0	4.97	SCT	4	2000	848.94	989.3333
2024	4	19	5	98.6	64.4	32.81	5.2539	2.348703	210	5	0	4.97	SCT	4	2000	926.14	989.3333
2024	4	19	6	100.4	64.4	31.07	4.20312	1.878963	120	4	0	4.97	SCT	4	2000	916.73	988.3333
2024	4	19	7	100.4	60.8	27.37	4.20312	1.878963	200	4	0	4.97	SCT	4	2000	897.95	988.3333
2024	4	19	8	100.4	60.8	27.37	5.2539	2.348703	180	5	0	4.97	FEW	2	2000	861.16	994.3333
2024	4	19	9	95	66.2	39	3.15234	1.409222	90	3	0	3.73	SCT	4	2000	807.62	993.3333
2024	4	19	10	95	66.2	39	3.15234	1.409222	160	3	0	4.35	SCT	4	2000	702.42	993.3333
2024	4	19	11	96.8	64.4	34.66	5.2539	2.348703	210	5	0	4.35	SCT	4	2000	525.86	992.3333
2024	4	19	12	98.6	66.2	34.93	4.20312	1.878963	220	4	0	4.35	SCT	4	2000	291.73	990.3333
2024	4	19	13	102.2	57.2	22.79	5.2539	2.348703	70	5	0	4.97	SCT	4	2000	0	991.3333
2024	4	19	14	100.4	62.6	29.17	6.30468	2.818444	160	6	0	4.97	SCT	4	2000	0	989.3333
2024	4	19	15	102.2	57.2	22.79	6.30468	2.818444	180	6	0	4.97	FEW	2	2000	0	989.3333
2024	4	19	16	104	53.6	18.95	3.15234	1.409222	110	3	0	4.97	FEW	2	2000	0	989.3333
2024	4	19	17	102.2	55.4	21.36	7.35546	3.288185	90	7	0	4.97	FEW	2	2000	0	989.3333
2024	4	19	18	102.2	55.4	21.36	6.30468	2.818444	130	6	0	4.97	FEW	2	2000	0	989.3333
2024	4	19	19	100.4	55.4	22.54	7.35546	3.288185	100	7	0	4.97	FEW	2	2000	0	994.3333
2024	4	19	20	87.8	75.2	66.35	3.15234	1.409222	110	3	0	3.11	FEW	2	2000	0	994.3333
2024	4	19	21	89.6	75.2	62.68	6.30468	2.818444	200	6	0	3.11	FEW	2	2000	0	994.3333
2024	4	19	22	91.4	68	46.41	5.2539	2.348703	130	5	0	3.73	FEW	2	2000	0	993.3333
2024	4	19	23	93.2	68	43.88	6.30468	2.818444	160	6	0	3.73	FEW	2	2000	0	993.3333
2024	4	20	0	95	66.2	39	5.2539	2.348703	200	5	0	3.73	FEW	2	2000	0	992.3333
2024	4	20	1	96.8	62.6	32.54	5.2539	2.348703	240	5	0	4.35	FEW	2	2000	0	992.3333
2024	4	20	2	96.8	59	28.63	3.15234	1.409222	120	3	0	4.35	FEW	2	2000	30.94	991.3333
2024	4	20	3	98.6	53.6	22.29	3.15234	1.409222	170	3	0	4.35	FEW	2	2000	697.85	990.3333
2024	4	20	4	100.4	48.2	17.28	4.20312	1.878963	220	4	0	4.97	FEW	2	2000	848.94	990.3333
2024	4	20	5	102.2	42.8	13.34	5.2539	2.348703	220	5	0	4.97	FEW	2	2000	926.14	989.3333
2024	4	20	6	104	42.8	12.64	8.40624	3.757926	160	8	0	4.97	FEW	2	2000	916.73	988.3333
2024	4	20	7	102.2	42.8	13.34	8.40624	3.757926	140	8	0	4.97	SCT	4	2000	897.95	988.3333
2024	4	20	8	102.2	46.4	15.3	10.5078	4.697407	120	10	0	4.97	SCT	4	2000	861.16	988.3333
2024	4	20	9	100.4	46.4	16.15	10.5078	4.697407	120	10	0	4.97	SCT	4	2000	807.62	994.3333
2024	4	20	10	86	68	55.04	4.20312	1.878963	230	4	0	3.73	SCT	4	2000	702.42	994.3333

2024	4	20	11	89.6	66.2	46.14	3.15234	1.409222	100	3	0	3.73	SCT	4	2000	525.86	994.3333
2024	4	20	12	89.6	64.4	43.34	4.20312	1.878963	130	4	0	4.35	SCT	4	2000	291.73	994.3333
2024	4	20	13	91.4	66.2	43.61	4.20312	1.878963	260	4	0	4.35	SCT	4	2000	0	993.3333
2024	4	20	14	93.2	60.8	34.11	5.2539	2.348703	220	5	0	4.35	FEW	2	2000	0	993.3333
2024	4	20	15	95	59	30.26	4.20312	1.878963	240	4	0	4.35	FEW	2	2000	0	992.3333
2024	4	20	16	95	57.2	28.37	4.20312	1.878963	170	4	0	4.35	FEW	2	2000	0	992.3333
2024	4	20	17	96.8	57.2	26.84	6.30468	2.818444	160	6	0	4.35	SCT	4	2000	0	991.3333
2024	4	20	18	98.6	55.4	23.81	10.5078	4.697407	160	10	0	4.35	SCT	4	2000	0	991.3333
2024	4	20	19	100.4	53.6	21.11	5.2539	2.348703	140	5	0	4.97	SCT	4	2000	0	989.3333
2024	4	20	20	100.4	53.6	21.11	7.35546	3.288185	90	7	0	4.97	SCT	4	2000	0	989.3333
2024	4	20	21	102.2	48.2	16.37	8.40624	3.757926	110	8	0	4.97	SCT	4	2000	0	989.3333
2024	4	20	22	102.2	48.2	16.37	10.5078	4.697407	110	10	0	4.97	SCT	4	2000	0	988.3333
2024	4	20	23	100.4	50	18.48	10.5078	4.697407	110	10	0	4.97	SCT	4	2000	0	988.3333
2024	4	21	0	100.4	50	18.48	10.5078	4.697407	100	10	0	4.97	SCT	4	2000	0	989.3333
2024	4	21	1	98.6	51.8	20.87	10.5078	4.697407	100	10	0	4.97	SCT	4	2000	0	994.3333
2024	4	21	2	87.8	62.6	43.07	3.15234	1.409222	260	3	0	3.73	SCT	4	2000	30.94	994.3333
2024	4	21	3	91.4	64.4	40.96	3.15234	1.409222	350	3	0	3.73	SCT	4	2000	697.85	993.3333
2024	4	21	4	93.2	64.4	38.73	3.15234	1.409222	350	3	0	3.73	SCT	4	2000	848.94	993.3333
2024	4	21	5	93.2	66.2	41.23	4.20312	1.878963	140	4	0	3.73	SCT	4	2000	926.14	993.3333
2024	4	21	6	95	64.4	36.63	5.2539	2.348703	160	5	0	3.73	SCT	4	2000	916.73	992.3333
2024	4	21	7	96.8	64.4	34.66	5.2539	2.348703	140	5	0	3.73	SCT	4	2000	897.95	992.3333
2024	4	21	8	98.6	64.4	32.81	4.20312	1.878963	220	4	0	4.35	SCT	4	2000	861.16	991.3333
2024	4	21	9	98.6	60.8	28.9	4.20312	1.878963	270	4	0	4.35	SCT	4	2000	807.62	990.3333
2024	4	21	10	100.4	60.8	27.37	5.2539	2.348703	280	5	0	4.35	SCT	4	2000	702.42	989.3333
2024	4	21	11	102.2	55.4	21.36	7.35546	3.288185	100	7	0	4.35	SCT	4	2000	525.86	989.3333
2024	4	21	12	102.2	53.6	20	8.40624	3.757926	110	8	0	4.97	SCT	4	2000	291.73	989.3333
2024	4	21	13	100.4	55.4	22.54	8.40624	3.757926	140	8	0	4.97	SCT	4	2000	0	989.3333
2024	4	21	14	100.4	53.6	21.11	10.5078	4.697407	130	10	0	4.97	SCT	4	2000	0	988.3333
2024	4	21	15	100.4	57.2	24.06	10.5078	4.697407	110	10	0	4.97	SCT	4	2000	0	989.3333
2024	4	21	16	100.4	57.2	24.06	10.5078	4.697407	120	10	0	4.97	SCT	4	2000	0	989.3333
2024	4	21	17	98.6	57.2	25.41	10.5078	4.697407	100	10	0	4.97	SCT	4	2000	0	994.3333
2024	4	21	18	86	73.4	66.15	4.20312	1.878963	230	4	0	3.11	SCT	4	2000	0	994.3333

2024	4	21	19	89.6	69.8	52.23	3.15234	1.409222	290	3	0	3.11	SCT	4	2000	0	994.3333
2024	4	21	20	91.4	69.8	49.36	5.2539	2.348703	190	5	0	3.11	SCT	4	2000	0	993.3333
2024	4	21	21	91.4	69.8	49.36	4.20312	1.878963	210	4	0	3.11	SCT	4	2000	0	993.3333
2024	4	21	22	93.2	69.8	46.67	3.15234	1.409222	140	3	0	3.11	SCT	4	2000	0	993.3333
2024	4	21	23	95	66.2	39	5.2539	2.348703	170	5	0	3.11	SCT	4	2000	0	992.3333
2024	4	22	0	95	66.2	39	5.2539	2.348703	160	5	0	3.11	SCT	4	2000	0	992.3333
2024	4	22	1	98.6	59	27.1	7.35546	3.288185	150	7	0	3.73	SCT	4	2000	0	991.3333
2024	4	22	2	100.4	50	18.48	10.5078	4.697407	130	10	0	3.73	SCT	4	2000	30.94	990.3333
2024	4	22	3	102.2	51.8	18.72	13.6601	6.106629	130	13	0	4.35	SCT	4	2000	697.85	990.3333
2024	4	22	4	102.2	48.2	16.37	14.7109	6.57637	130	14	0	4.35	SCT	4	2000	848.94	990.3333
2024	4	22	5	102.2	48.2	16.37	13.6601	6.106629	110	13	0	4.35	SCT	4	2000	926.14	989.3333
2024	4	22	6	102.2	51.8	18.72	9.45702	4.227666	130	9	0	4.35	SCT	4	2000	916.73	988.3333
2024	4	22	7	102.2	53.6	20	10.5078	4.697407	100	10	0	4.97	SCT	4	2000	897.95	988.3333
2024	4	22	8	100.4	53.6	21.11	10.5078	4.697407	120	10	0	4.97	SCT	4	2000	861.16	989.3333
2024	4	22	9	100.4	51.8	19.76	12.6094	5.636888	130	12	0	4.97	SCT	4	2000	807.62	989.3333
2024	4	22	10	98.6	50	19.52	10.5078	4.697407	100	10	0	4.97	SCT	4	2000	702.42	994.3333
2024	4	22	11	84.2	71.6	65.95	3.15234	1.409222	210	3	0	3.11	SCT	4	2000	525.86	994.3333
2024	4	22	12	87.8	71.6	58.78	3.15234	1.409222	160	3	0	3.11	SCT	4	2000	291.73	994.3333
2024	4	22	13	93.2	69.8	46.67	2.10156	0.939481	70	2	0	3.11	SCT	4	2000	0	993.3333
2024	4	22	14	91.4	68	46.41	3.15234	1.409222	130	3	0	3.11	SCT	4	2000	0	993.3333
2024	4	22	15	95	66.2	39	2.10156	0.939481	70	2	0	3.11	SCT	4	2000	0	992.3333
2024	4	22	16	96.8	62.6	32.54	4.20312	1.878963	170	4	0	3.11	SCT	4	2000	0	992.3333
2024	4	22	17	96.8	62.6	32.54	3.15234	1.409222	210	3	0	3.11	SCT	4	2000	0	992.3333
2024	4	22	18	100.4	57.2	24.06	5.2539	2.348703	180	5	0	3.73	SCT	4	2000	0	991.3333
2024	4	22	19	100.4	53.6	21.11	4.20312	1.878963	200	4	0	4.35	SCT	4	2000	0	990.3333
2024	4	22	20	100.4	53.6	21.11	2.10156	0.939481	80	2	0	4.97	SCT	4	2000	0	990.3333
2024	4	22	21	102.2	51.8	18.72	2.10156	0.939481	80	2	0	4.97	SCT	4	2000	0	989.3333
2024	4	22	22	102.2	51.8	18.72	8.40624	3.757926	120	8	0	4.97	SCT	4	2000	0	989.3333
2024	4	22	23	102.2	51.8	18.72	10.5078	4.697407	100	10	0	4.97	SCT	4	2000	0	989.3333
2024	4	23	0	102.2	48.2	16.37	10.5078	4.697407	110	10	0	4.97	SCT	4	2000	0	989.3333
2024	4	23	1	100.4	51.8	19.76	8.40624	3.757926	120	8	0	4.97	SCT	4	2000	0	989.3333
2024	4	23	2	100.4	51.8	19.76	10.5078	4.697407	120	10	0	4.97	SCT	4	2000	30.94	994.3333

2024	4	23	3	86	68	55.04	2.10156	0.939481	80	2	0	3.11	SCT	4	2000	697.85	994.3333
2024	4	23	4	89.6	64.4	43.34	4.20312	1.878963	150	4	0	3.11	SCT	4	2000	848.94	994.3333
2024	4	23	5	89.6	59	35.81	4.20312	1.878963	200	4	0	3.73	SCT	4	2000	926.14	994.3333
2024	4	23	6	91.4	59	33.84	6.30468	2.818444	200	6	0	3.73	SCT	4	2000	916.73	994.3333
2024	4	23	7	91.4	60.8	36.08	5.2539	2.348703	210	5	0	3.73	SCT	4	2000	897.95	993.3333
2024	4	23	8	95	62.6	34.39	5.2539	2.348703	200	5	0	3.73	SCT	4	2000	861.16	993.3333
2024	4	23	9	96.8	57.2	26.84	7.35546	3.288185	120	7	0	3.73	SCT	4	2000	807.62	992.3333
2024	4	23	10	96.8	55.4	25.15	8.40624	3.757926	180	8	0	3.73	SCT	4	2000	702.42	991.3333
2024	4	23	11	100.4	55.4	22.54	4.20312	1.878963	140	4	0	3.73	SCT	4	2000	525.86	990.3333
2024	4	23	12	100.4	53.6	21.11	6.30468	2.818444	100	6	0	3.73	SCT	4	2000	291.73	989.3333
2024	4	23	13	100.4	55.4	22.54	6.30468	2.818444	180	6	0	3.73	SCT	4	2000	0	989.3333
2024	4	23	14	102.2	55.4	21.36	7.35546	3.288185	210	7	0	3.73	SCT	4	2000	0	989.3333
2024	4	23	15	100.4	55.4	22.54	4.20312	1.878963	160	4	0	3.73	SCT	4	2000	0	989.3333
2024	4	23	16	100.4	55.4	22.54	4.20312	1.878963	180	4	0	3.73	SCT	4	2000	0	989.3333
2024	4	23	17	100.4	57.2	24.06	6.30468	2.818444	130	6	0	3.73	SCT	4	2000	0	996
2024	4	23	18	86	73.4	66.15	5.2539	2.348703	130	5	0	3.73	SCT	4	2000	0	996
2024	4	23	19	89.6	71.6	55.53	7.35546	3.288185	180	7	0	4.35	SCT	4	2000	0	996
2024	4	23	20	89.6	69.8	52.23	5.2539	2.348703	190	5	0	4.35	SCT	4	2000	0	996
2024	4	23	21	91.4	66.2	43.61	8.40624	3.757926	130	8	0	4.35	SCT	4	2000	0	996
2024	4	23	22	95	60.8	32.27	5.2539	2.348703	150	5	0	4.35	SCT	4	2000	0	995
2024	4	23	23	95	64.4	36.63	3.15234	1.409222	50	3	0	4.35	SCT	4	2000	0	995
2024	4	24	0	96.8	66.2	36.9	5.2539	2.348703	210	5	0	4.35	SCT	4	2000	0	994.3333
2024	4	24	1	96.8	62.6	32.54	5.2539	2.348703	220	5	0	4.97	SCT	4	2000	0	993.3333
2024	4	24	2	98.6	57.2	25.41	5.2539	2.348703	110	5	0	4.97	SCT	4	2000	30.94	992.3333
2024	4	24	3	100.4	53.6	21.11	4.20312	1.878963	190	4	0	4.97	SCT	4	1800	697.85	992.3333
2024	4	24	4	100.4	53.6	21.11	4.20312	1.878963	120	4	0	4.97	SCT	4	1800	848.94	991.3333
2024	4	24	5	102.2	51.8	18.72	4.20312	1.878963	110	4	0	4.97	SCT	4	2000	926.14	990.3333
2024	4	24	6	102.2	53.6	20	5.2539	2.348703	150	5	0	4.97	SCT	4	2000	916.73	990.3333
2024	4	24	7	102.2	53.6	20	4.20312	1.878963	160	4	0	4.97	SCT	4	2000	897.95	990.3333
2024	4	24	8	102.2	51.8	18.72	5.2539	2.348703	170	5	0	4.97	SCT	4	2000	861.16	989.3333
2024	4	24	9	102.2	48.2	16.37	4.20312	1.878963	180	4	0	4.97	SCT	4	2000	807.62	989.3333
2024	4	24	10	102.2	50	17.51	4.20312	1.878963	140	4	0	4.97	SCT	4	2000	702.42	990.3333

2024	4	24	11	102.2	50	17.51	4.20312	1.878963	130	4	0	4.97	SCT	4	2000	525.86	995
2024	4	24	12	87.8	75.2	66.35	5.2539	2.348703	140	5	0	3.73	SCT	4	2000	291.73	995
2024	4	24	13	89.6	75.2	62.68	4.20312	1.878963	280	4	0	3.73	SCT	4	2000	0	994.3333
2024	4	24	14	89.6	73.4	59.01	4.20312	1.878963	210	4	0	4.35	SCT	4	2000	0	994.3333
2024	4	24	15	91.4	71.6	52.48	4.20312	1.878963	200	4	0	4.35	SCT	4	2000	0	994.3333
2024	4	24	16	93.2	71.6	49.62	6.30468	2.818444	220	6	0	4.35	SCT	4	2000	0	993.3333
2024	4	24	17	95	71.6	46.93	5.2539	2.348703	210	5	0	4.97	SCT	4	2000	0	992.3333
2024	4	24	18	96.8	69.8	41.77	7.35546	3.288185	170	7	0	4.97	SCT	4	2000	0	992.3333
2024	4	24	19	96.8	68	39.27	8.40624	3.757926	210	8	0	4.97	SCT	4	2000	0	991.3333
2024	4	24	20	98.6	66.2	34.93	7.35546	3.288185	220	7	0	4.97	SCT	4	2000	0	990.3333
2024	4	24	21	98.6	66.2	34.93	5.2539	2.348703	130	5	0	4.97	SCT	4	2000	0	989.3333
2024	4	24	22	98.6	64.4	32.81	5.2539	2.348703	210	5	0	4.97	SCT	4	2000	0	989.3333
2024	4	24	23	100.4	64.4	31.07	4.20312	1.878963	120	4	0	4.97	SCT	4	2000	0	988.3333
2024	4	25	0	100.4	60.8	27.37	4.20312	1.878963	200	4	0	4.97	SCT	4	2000	0	988.3333
2024	4	25	1	100.4	60.8	27.37	5.2539	2.348703	180	5	0	4.97	SCT	4	1800	0	994.3333
2024	4	25	2	95	66.2	39	3.15234	1.409222	90	3	0	3.73	SCT	4	1800	30.94	993.3333
2024	4	25	3	95	66.2	39	3.15234	1.409222	160	3	0	4.35	SCT	4	1800	697.85	993.3333
2024	4	25	4	96.8	64.4	34.66	5.2539	2.348703	210	5	0	4.35	SCT	4	1800	848.94	992.3333
2024	4	25	5	98.6	66.2	34.93	4.20312	1.878963	220	4	0	4.35	SCT	4	1800	926.14	990.3333
2024	4	25	6	102.2	57.2	22.79	5.2539	2.348703	70	5	0	4.97	SCT	4	1800	916.73	991.3333
2024	4	25	7	100.4	62.6	29.17	6.30468	2.818444	160	6	0	4.97	SCT	4	1800	897.95	989.3333
2024	4	25	8	102.2	57.2	22.79	6.30468	2.818444	180	6	0	4.97	SCT	4	2000	861.16	989.3333
2024	4	25	9	104	53.6	18.95	3.15234	1.409222	110	3	0	4.97	SCT	4	2000	807.62	989.3333
2024	4	25	10	102.2	55.4	21.36	7.35546	3.288185	90	7	0	4.97	SCT	4	2000	702.42	989.3333
2024	4	25	11	102.2	55.4	21.36	6.30468	2.818444	130	6	0	4.97	SCT	4	2000	525.86	989.3333
2024	4	25	12	100.4	55.4	22.54	7.35546	3.288185	100	7	0	4.97	SCT	4	2000	291.73	994.3333
2024	4	25	13	87.8	75.2	66.35	3.15234	1.409222	110	3	0	3.11	SCT	4	2000	0	994.3333
2024	4	25	14	89.6	75.2	62.68	6.30468	2.818444	200	6	0	3.11	SCT	4	2000	0	994.3333
2024	4	25	15	91.4	68	46.41	5.2539	2.348703	130	5	0	3.73	SCT	4	2000	0	993.3333
2024	4	25	16	93.2	68	43.88	6.30468	2.818444	160	6	0	3.73	SCT	4	2000	0	993.3333
2024	4	25	17	95	66.2	39	5.2539	2.348703	200	5	0	3.73	SCT	4	2000	0	992.3333
2024	4	25	18	96.8	62.6	32.54	5.2539	2.348703	240	5	0	4.35	SCT	4	2000	0	992.3333

2024	4	25	19	96.8	59	28.63	3.15234	1.409222	120	3	0	4.35	SCT	4	2000	0	991.3333
2024	4	25	20	98.6	53.6	22.29	3.15234	1.409222	170	3	0	4.35	SCT	4	2000	0	990.3333
2024	4	25	21	100.4	48.2	17.28	4.20312	1.878963	220	4	0	4.97	SCT	4	2000	0	990.3333
2024	4	25	22	102.2	42.8	13.34	5.2539	2.348703	220	5	0	4.97	SCT	4	2000	0	989.3333
2024	4	25	23	104	42.8	12.64	8.40624	3.757926	160	8	0	4.97	SCT	4	2000	0	988.3333
2024	4	26	0	102.2	42.8	13.34	8.40624	3.757926	140	8	0	4.97	SCT	4	1800	0	988.3333
2024	4	26	1	102.2	46.4	15.3	10.5078	4.697407	120	10	0	4.97	SCT	4	2000	0	988.3333
2024	4	26	2	100.4	46.4	16.15	10.5078	4.697407	120	10	0	4.97	SCT	4	2000	30.94	994.3333
2024	4	26	3	86	68	55.04	4.20312	1.878963	230	4	0	3.73	SCT	4	2000	697.85	994.3333
2024	4	26	4	89.6	66.2	46.14	3.15234	1.409222	100	3	0	3.73	SCT	4	2000	848.94	994.3333
2024	4	26	5	89.6	64.4	43.34	4.20312	1.878963	130	4	0	4.35	SCT	4	2000	926.14	994.3333
2024	4	26	6	91.4	66.2	43.61	4.20312	1.878963	260	4	0	4.35	SCT	4	2000	916.73	993.3333
2024	4	26	7	93.2	60.8	34.11	5.2539	2.348703	220	5	0	4.35	SCT	4	2000	897.95	993.3333
2024	4	26	8	95	59	30.26	4.20312	1.878963	240	4	0	4.35	SCT	4	2000	861.16	992.3333
2024	4	26	9	95	57.2	28.37	4.20312	1.878963	170	4	0	4.35	SCT	4	2000	807.62	992.3333
2024	4	26	10	96.8	57.2	26.84	6.30468	2.818444	160	6	0	4.35	SCT	4	2000	702.42	991.3333
2024	4	26	11	98.6	55.4	23.81	10.5078	4.697407	160	10	0	4.35	SCT	4	2000	525.86	991.3333
2024	4	26	12	100.4	53.6	21.11	5.2539	2.348703	140	5	0	4.97	SCT	4	2000	291.73	989.3333
2024	4	26	13	100.4	53.6	21.11	7.35546	3.288185	90	7	0	4.97	SCT	4	2000	0	989.3333
2024	4	26	14	102.2	48.2	16.37	8.40624	3.757926	110	8	0	4.97	SCT	4	2000	0	989.3333
2024	4	26	15	102.2	48.2	16.37	10.5078	4.697407	110	10	0	4.97	SCT	4	2000	0	988.3333
2024	4	26	16	100.4	50	18.48	10.5078	4.697407	110	10	0	4.97	SCT	4	2000	0	988.3333
2024	4	26	17	100.4	50	18.48	10.5078	4.697407	100	10	0	4.97	SCT	4	2000	0	989.3333
2024	4	26	18	98.6	51.8	20.87	10.5078	4.697407	100	10	0	4.97	SCT	4	2000	0	994.3333
2024	4	26	19	87.8	62.6	43.07	3.15234	1.409222	260	3	0	3.73	SCT	4	2000	0	994.3333
2024	4	26	20	91.4	64.4	40.96	3.15234	1.409222	350	3	0	3.73	SCT	4	2000	0	993.3333
2024	4	26	21	93.2	64.4	38.73	3.15234	1.409222	350	3	0	3.73	SCT	4	2000	0	993.3333
2024	4	26	22	93.2	66.2	41.23	4.20312	1.878963	140	4	0	3.73	SCT	4	2000	0	993.3333
2024	4	26	23	95	64.4	36.63	5.2539	2.348703	160	5	0	3.73	SCT	4	2000	0	992.3333
2024	4	27	0	96.8	64.4	34.66	5.2539	2.348703	140	5	0	3.73	SCT	4	2000	0	992.3333
2024	4	27	1	98.6	64.4	32.81	4.20312	1.878963	220	4	0	4.35	SCT	4	2000	0	991.3333
2024	4	27	2	98.6	60.8	28.9	4.20312	1.878963	270	4	0	4.35	SCT	4	2000	30.94	990.3333

2024	4	27	3	100.4	60.8	27.37	5.2539	2.348703	280	5	0	4.35	SCT	4	2000	697.85	989.3333
2024	4	27	4	102.2	55.4	21.36	7.35546	3.288185	100	7	0	4.35	SCT	4	2000	848.94	989.3333
2024	4	27	5	102.2	53.6	20	8.40624	3.757926	110	8	0	4.97	SCT	4	2000	926.14	989.3333
2024	4	27	6	100.4	55.4	22.54	8.40624	3.757926	140	8	0	4.97	SCT	4	2000	916.73	989.3333
2024	4	27	7	100.4	53.6	21.11	10.5078	4.697407	130	10	0	4.97	SCT	4	2000	897.95	988.3333
2024	4	27	8	100.4	57.2	24.06	10.5078	4.697407	110	10	0	4.97	SCT	4	2000	861.16	989.3333
2024	4	27	9	100.4	57.2	24.06	10.5078	4.697407	120	10	0	4.97	SCT	4	2000	807.62	989.3333
2024	4	27	10	98.6	57.2	25.41	10.5078	4.697407	100	10	0	4.97	SCT	4	2000	702.42	994.3333
2024	4	27	11	86	73.4	66.15	4.20312	1.878963	230	4	0	3.11	SCT	4	2000	525.86	994.3333
2024	4	27	12	89.6	69.8	52.23	3.15234	1.409222	290	3	0	3.11	SCT	4	2000	291.73	994.3333
2024	4	27	13	91.4	69.8	49.36	5.2539	2.348703	190	5	0	3.11	SCT	4	2000	0	993.3333
2024	4	27	14	91.4	69.8	49.36	4.20312	1.878963	210	4	0	3.11	SCT	4	2000	0	993.3333
2024	4	27	15	93.2	69.8	46.67	3.15234	1.409222	140	3	0	3.11	SCT	4	2000	0	993.3333
2024	4	27	16	95	66.2	39	5.2539	2.348703	170	5	0	3.11	SCT	4	2000	0	992.3333
2024	4	27	17	95	66.2	39	5.2539	2.348703	160	5	0	3.11	SCT	4	2000	0	992.3333
2024	4	27	18	98.6	59	27.1	7.35546	3.288185	150	7	0	3.73	SCT	4	2000	0	991.3333
2024	4	27	19	100.4	50	18.48	10.5078	4.697407	130	10	0	3.73	SCT	4	2000	0	990.3333
2024	4	27	20	102.2	51.8	18.72	13.6601	6.106629	130	13	0	4.35	SCT	4	2000	0	990.3333
2024	4	27	21	102.2	48.2	16.37	14.7109	6.57637	130	14	0	4.35	SCT	4	2000	0	990.3333
2024	4	27	22	102.2	48.2	16.37	13.6601	6.106629	110	13	0	4.35	SCT	4	2000	0	989.3333
2024	4	27	23	102.2	51.8	18.72	9.45702	4.227666	130	9	0	4.35	SCT	4	2000	0	988.3333
2024	4	28	0	102.2	53.6	20	10.5078	4.697407	100	10	0	4.97	SCT	4	2000	0	988.3333
2024	4	28	1	100.4	53.6	21.11	10.5078	4.697407	120	10	0	4.97	SCT	4	1800	0	989.3333
2024	4	28	2	100.4	51.8	19.76	12.6094	5.636888	130	12	0	4.97	SCT	4	1800	30.94	989.3333
2024	4	28	3	98.6	50	19.52	10.5078	4.697407	100	10	0	4.97	SCT	4	1800	697.85	994.3333
2024	4	28	4	84.2	71.6	65.95	3.15234	1.409222	210	3	0	3.11	SCT	4	1800	848.94	994.3333
2024	4	28	5	87.8	71.6	58.78	3.15234	1.409222	160	3	0	3.11	FEW	2	1000	926.14	994.3333
2024	4	28	6	93.2	69.8	46.67	2.10156	0.939481	80	2	0	3.11	FEW	2	1000	916.73	993.3333
2024	4	28	7	91.4	68	46.41	3.15234	1.409222	130	3	0	3.11	FEW	2	1000	897.95	993.3333
2024	4	28	8	95	66.2	39	2.10156	0.939481	80	2	0	3.11	FEW	2	1000	861.16	992.3333
2024	4	28	9	96.8	62.6	32.54	4.20312	1.878963	170	4	0	3.11	FEW	2	1000	807.62	992.3333
2024	4	28	10	96.8	62.6	32.54	3.15234	1.409222	210	3	0	3.11	SCT	4	2000	702.42	992.3333

2024	4	28	11	100.4	57.2	24.06	5.2539	2.348703	180	5	0	3.73	SCT	4	2000	525.86	991.3333
2024	4	28	12	100.4	53.6	21.11	4.20312	1.878963	200	4	0	4.35	SCT	4	2000	291.73	990.3333
2024	4	28	13	100.4	53.6	21.11	2.10156	0.939481	80	2	0	4.97	SCT	4	2000	0	990.3333
2024	4	28	14	102.2	51.8	18.72	2.10156	0.939481	80	2	0	4.97	FEW	2	1500	0	989.3333
2024	4	28	15	102.2	51.8	18.72	8.40624	3.757926	120	8	0	4.97	FEW	2	1500	0	989.3333
2024	4	28	16	102.2	51.8	18.72	10.5078	4.697407	100	10	0	4.97	FEW	2	1500	0	989.3333
2024	4	28	17	102.2	48.2	16.37	10.5078	4.697407	110	10	0	4.97	FEW	2	1500	0	989.3333
2024	4	28	18	100.4	51.8	19.76	8.40624	3.757926	120	8	0	4.97	SCT	4	2000	0	989.3333
2024	4	28	19	100.4	51.8	19.76	10.5078	4.697407	120	10	0	4.97	SCT	4	2000	0	994.3333
2024	4	28	20	86	68	55.04	2.10156	0.939481	80	2	0	3.11	SCT	4	2000	0	994.3333
2024	4	28	21	89.6	64.4	43.34	4.20312	1.878963	150	4	0	3.11	SCT	4	2000	0	994.3333
2024	4	28	22	89.6	59	35.81	4.20312	1.878963	200	4	0	3.73	SCT	4	2000	0	994.3333
2024	4	28	23	91.4	59	33.84	6.30468	2.818444	200	6	0	3.73	FEW	2	1500	0	994.3333
2024	4	29	0	91.4	60.8	36.08	5.2539	2.348703	210	5	0	3.73	FEW	2	1500	0	993.3333
2024	4	29	1	95	62.6	34.39	5.2539	2.348703	200	5	0	3.73	FEW	2	1500	0	993.3333
2024	4	29	2	96.8	57.2	26.84	7.35546	3.288185	120	7	0	3.73	FEW	2	1500	30.94	992.3333
2024	4	29	3	96.8	55.4	25.15	8.40624	3.757926	180	8	0	3.73	FEW	2	1500	697.85	991.3333
2024	4	29	4	100.4	55.4	22.54	4.20312	1.878963	140	4	0	3.73	FEW	2	1500	848.94	990.3333
2024	4	29	5	100.4	53.6	21.11	6.30468	2.818444	100	6	0	3.73	SCT	4	2000	926.14	989.3333
2024	4	29	6	100.4	55.4	22.54	6.30468	2.818444	180	6	0	3.73	SCT	4	2000	916.73	989.3333
2024	4	29	7	102.2	55.4	21.36	7.35546	3.288185	210	7	0	3.73	SCT	4	2000	897.95	989.3333
2024	4	29	8	100.4	55.4	22.54	4.20312	1.878963	160	4	0	3.73	SCT	4	2000	861.16	989.3333
2024	4	29	9	100.4	55.4	22.54	4.20312	1.878963	180	4	0	3.73	SCT	4	2000	807.62	989.3333
2024	4	29	10	100.4	57.2	24.06	6.30468	2.818444	130	6	0	3.73	SCT	4	2000	702.42	996
2024	4	29	11	86	73.4	66.15	5.2539	2.348703	130	5	0	3.73	SCT	4	2000	525.86	996
2024	4	29	12	89.6	71.6	55.53	7.35546	3.288185	180	7	0	4.35	SCT	4	2000	291.73	996
2024	4	29	13	89.6	69.8	52.23	5.2539	2.348703	190	5	0	4.35	SCT	4	2000	0	996
2024	4	29	14	91.4	66.2	43.61	8.40624	3.757926	130	8	0	4.35	SCT	4	2000	0	996
2024	4	29	15	95	60.8	32.27	5.2539	2.348703	150	5	0	4.35	SCT	4	2000	0	995
2024	4	29	16	95	64.4	36.63	3.15234	1.409222	50	3	0	4.35	SCT	4	2000	0	995
2024	4	29	17	96.8	66.2	36.9	5.2539	2.348703	210	5	0	4.35	SCT	4	2000	0	994.3333
2024	4	29	18	96.8	62.6	32.54	5.2539	2.348703	220	5	0	4.97	SCT	4	2000	0	993.3333

2024	4	29	19	98.6	57.2	25.41	5.2539	2.348703	110	5	0	4.97	SCT	4	2000	0	992.3333
2024	4	29	20	100.4	53.6	21.11	4.20312	1.878963	190	4	0	4.97	SCT	4	2000	0	992.3333
2024	4	29	21	100.4	53.6	21.11	4.20312	1.878963	120	4	0	4.97	SCT	4	2000	0	991.3333
2024	4	29	22	102.2	51.8	18.72	4.20312	1.878963	110	4	0	4.97	SCT	4	2000	0	990.3333
2024	4	29	23	102.2	53.6	20	5.2539	2.348703	150	5	0	4.97	SCT	4	2000	0	990.3333
2024	4	30	0	102.2	53.6	20	4.20312	1.878963	160	4	0	4.97	SCT	4	2000	0	990.3333
2024	4	30	1	102.2	51.8	18.72	5.2539	2.348703	170	5	0	4.97	SCT	4	2000	0	989.3333
2024	4	30	2	102.2	48.2	16.37	4.20312	1.878963	180	4	0	4.97	SCT	4	2000	30.94	989.3333
2024	4	30	3	102.2	50	17.51	4.20312	1.878963	140	4	0	4.97	SCT	4	2000	697.85	990.3333
2024	4	30	4	102.2	50	17.51	4.20312	1.878963	130	4	0	4.97	SCT	4	2000	848.94	995
2024	4	30	5	87.8	75.2	66.35	5.2539	2.348703	140	5	0	3.73	SCT	4	2000	926.14	995
2024	4	30	6	89.6	75.2	62.68	4.20312	1.878963	280	4	0	3.73	FEW	4	2000	916.73	994.3333
2024	4	30	7	89.6	73.4	59.01	4.20312	1.878963	210	4	0	4.35	SCT	4	2000	897.95	994.3333
2024	4	30	8	91.4	71.6	52.48	4.20312	1.878963	200	4	0	4.35	SCT	4	2000	861.16	994.3333
2024	4	30	9	93.2	71.6	49.62	6.30468	2.818444	220	6	0	4.35	SCT	4	2000	807.62	993.3333
2024	4	30	10	95	71.6	46.93	5.2539	2.348703	210	5	0	4.97	SCT	4	2000	702.42	992.3333
2024	4	30	11	96.8	69.8	41.77	7.35546	3.288185	170	7	0	4.97	SCT	4	2000	525.86	992.3333
2024	4	30	12	96.8	68	39.27	8.40624	3.757926	210	8	0	4.97	SCT	4	2000	291.73	991.3333
2024	4	30	13	98.6	66.2	34.93	7.35546	3.288185	220	7	0	4.97	FEW	2	2000	0	990.3333
2024	4	30	14	98.6	66.2	34.93	5.2539	2.348703	130	5	0	4.97	FEW	2	2000	0	989.3333
2024	4	30	15	98.6	64.4	32.81	5.2539	2.348703	210	5	0	4.97	FEW	2	2000	0	989.3333
2024	4	30	16	100.4	64.4	31.07	4.20312	1.878963	120	4	0	4.97	FEW	2	2000	0	988.3333
2024	4	30	17	100.4	60.8	27.37	4.20312	1.878963	200	4	0	4.97	FEW	2	2000	0	988.3333
2024	4	30	18	100.4	60.8	27.37	5.2539	2.348703	180	5	0	4.97	FEW	2	2000	0	990.3333
2024	4	30	19	98.6	66.2	34.93	5.2539	2.348703	130	5	0	4.97	FEW	2	2000	0	989.3333
2024	4	30	20	98.6	64.4	32.81	5.2539	2.348703	210	5	0	4.97	FEW	2	2000	0	989.3333
2024	4	30	21	100.4	64.4	31.07	4.20312	1.878963	120	4	0	4.97	FEW	2	2000	0	988.3333
2024	4	30	22	100.4	60.8	27.37	4.20312	1.878963	200	4	0	4.97	FEW	2	2000	0	988.3333
2024	4	30	23	100.4	60.8	27.37	5.2539	2.348703	180	5	0	4.97	FEW	2	2000	0	993.3333
2024	5	1	0	87.8	75.2	66.35	2.10156	0.939481	40	2	0	3.11	FEW	2	2000	0	992.3333
2024	5	1	1	91.4	75.2	59.24	2.10156	0.939481	40	2	0	3.11	FEW	2	2000	0	992.3333
2024	5	1	2	91.4	75.2	59.24	4.20312	1.878963	340	4	0	3.11	FEW	2	2000	3.84	992.3333

2024	5	1	3	91.4	75.2	59.24	5.2539	2.348703	220	5	0	3.11	FEW	2	2000	37.72	992.3333
2024	5	1	4	93.2	73.4	52.73	3.15234	1.409222	240	3	0	3.11	FEW	2	2000	641.41	991.3333
2024	5	1	5	95	73.4	49.87	5.2539	2.348703	260	5	0	3.11	SCT	4	2000	777.58	991.3333
2024	5	1	6	95	71.6	46.93	4.20312	1.878963	200	4	0	2.49	SCT	4	2000	854.51	990.3333
2024	5	1	7	96.8	68	39.27	5.2539	2.348703	210	5	0	3.73	SCT	4	2000	891.46	989.3333
2024	5	1	8	98.6	68	37.17	6.30468	2.818444	100	6	0	3.73	SCT	4	2000	885.01	989.3333
2024	5	1	9	98.6	68	37.17	4.20312	1.878963	180	4	0	3.73	SCT	4	2000	855.86	988.3333
2024	5	1	10	102.2	66.2	31.34	5.2539	2.348703	50	5	0	3.73	SCT	4	2000	808.99	987.3333
2024	5	1	11	102.2	64.4	29.43	5.2539	2.348703	180	5	0	3.73	SCT	4	2000	737.26	986.3333
2024	5	1	12	102.2	64.4	29.43	3.15234	1.409222	210	3	0	3.73	FEW	2	2000	619.79	986.3333
2024	5	1	13	102.2	64.4	29.43	5.2539	2.348703	90	5	0	3.73	FEW	2	2000	432.59	986.3333
2024	5	1	14	102.2	62.6	27.63	4.20312	1.878963	170	4	0	3.73	FEW	2	2000	225.6	986.3333
2024	5	1	15	102.2	62.6	27.63	3.15234	1.409222	140	3	0	3.73	SCT	4	2000	0	986.3333
2024	5	1	16	104	64.4	27.89	4.20312	1.878963	160	4	0	3.73	SCT	4	2000	0	992.3333
2024	5	1	17	86	77	74.61	3.15234	1.409222	220	3	0	3.11	SCT	4	2000	0	993.3333
2024	5	1	18	89.6	77	66.55	4.20312	1.878963	170	4	0	3.11	SCT	4	2000	0	992.3333
2024	5	1	19	91.4	75.2	59.24	6.30468	2.818444	190	6	0	3.11	SCT	4	2000	0	992.3333
2024	5	1	20	95	73.4	49.87	4.20312	1.878963	220	4	0	3.11	SCT	4	2000	0	991.3333
2024	5	1	21	96.8	73.4	47.19	4.20312	1.878963	160	4	0	3.11	SCT	4	2000	0	991.3333
2024	5	1	22	96.8	71.6	44.41	6.30468	2.818444	170	6	0	3.11	SCT	4	2000	0	990.3333
2024	5	1	23	100.4	71.6	39.81	4.20312	1.878963	290	4	0	3.11	SCT	4	2000	0	989.3333
2024	5	2	0	100.4	71.6	39.81	5.2539	2.348703	170	5	0	3.11	SCT	4	2000	0	989.3333
2024	5	2	1	100.4	69.8	37.44	6.30468	2.818444	180	6	0	3.73	SCT	4	2000	0	988.3333
2024	5	2	2	102.2	68	33.35	4.20312	1.878963	140	4	0	3.73	SCT	4	2000	0	987.3333
2024	5	2	3	104	64.4	27.89	5.2539	2.348703	210	5	0	3.73	SCT	4	2000	0	987.3333
2024	5	2	4	102.2	66.2	31.34	6.30468	2.818444	180	6	0	3.73	SCT	4	2000	3.84	987.3333
2024	5	2	5	100.4	64.4	31.07	7.35546	3.288185	70	7	0	3.73	SCT	4	2000	37.72	987.3333
2024	5	2	6	98.6	53.6	22.29	4.20312	1.878963	100	4	0	3.73	SCT	4	2000	641.41	986.3333
2024	5	2	7	98.6	64.4	32.81	5.2539	2.348703	120	5	0	3.73	SCT	4	2000	777.58	987.3333
2024	5	2	8	100.4	64.4	31.07	6.30468	2.818444	120	6	0	3.73	SCT	4	2000	854.51	987.3333
2024	5	2	9	100.4	62.6	29.17	5.2539	2.348703	120	5	0	3.73	SCT	4	2000	891.46	988.3333
2024	5	2	10	100.4	64.4	31.07	5.2539	2.348703	170	5	0	3.73	SCT	4	2000	885.01	993.3333

2024	5	2	11	87.8	73.4	62.47	6.30468	2.818444	180	6	0	3.11	SCT	4	2000	855.86	994.3333
2024	5	2	12	89.6	75.2	62.68	6.30468	2.818444	210	6	0	3.11	SCT	4	2000	808.99	994.3333
2024	5	2	13	91.4	75.2	59.24	6.30468	2.818444	190	6	0	3.11	SCT	4	2000	737.26	993.3333
2024	5	2	14	91.4	75.2	59.24	5.2539	2.348703	190	5	0	3.11	SCT	4	2000	619.79	993.3333
2024	5	2	15	93.2	75.2	56.01	4.20312	1.878963	210	4	0	3.11	SCT	4	2000	432.59	993.3333
2024	5	2	16	95	73.4	49.87	4.20312	1.878963	190	4	0	3.11	SCT	4	2000	225.6	992.3333
2024	5	2	17	95	73.4	49.87	4.20312	1.878963	160	4	0	3.11	SCT	4	2000	0	991.3333
2024	5	2	18	96.8	71.6	44.41	4.20312	1.878963	140	4	0	3.11	SCT	4	2000	0	991.3333
2024	5	2	19	98.6	69.8	39.54	7.35546	3.288185	170	7	0	3.73	SCT	4	2000	0	990.3333
2024	5	2	20	100.4	69.8	37.44	6.30468	2.818444	180	6	0	3.73	SCT	4	2000	0	989.3333
2024	5	2	21	100.4	68	35.2	5.2539	2.348703	160	5	0	3.73	SCT	4	2000	0	989.3333
2024	5	2	22	100.4	66.2	33.08	4.20312	1.878963	220	4	0	3.73	SCT	4	2000	0	988.3333
2024	5	2	23	100.4	62.6	29.17	4.20312	1.878963	170	4	0	4.35	SCT	4	2000	0	988.3333
2024	5	3	0	102.2	50	17.51	5.2539	2.348703	160	5	0	4.35	SCT	4	2000	0	988.3333
2024	5	3	1	102.2	57.2	22.79	6.30468	2.818444	180	6	0	4.35	SCT	4	2000	0	989.3333
2024	5	3	2	100.4	60.8	27.37	4.20312	1.878963	240	4	0	4.35	SCT	4	2000	0	990.3333
2024	5	3	3	87.8	68	51.98	12.6094	5.636888	20	12	0	3.73	SCT	4	2000	0	995
2024	5	3	4	86	77	74.61	4.20312	1.878963	230	4	0	3.11	SCT	4	2000	0	995
2024	5	3	5	91.4	77	62.9	4.20312	1.878963	190	4	0	3.11	SCT	4	2000	0	994.3333
2024	5	3	6	93.2	75.2	56.01	3.15234	1.409222	160	3	0	3.11	SCT	4	2000	3.84	993.3333
2024	5	3	7	95	73.4	49.87	5.2539	2.348703	180	5	0	3.11	SCT	4	2000	37.72	993.3333
2024	5	3	8	96.8	73.4	47.19	8.40624	3.757926	160	8	0	3.11	SCT	4	2000	641.41	992.3333
2024	5	3	9	96.8	73.4	47.19	5.2539	2.348703	150	5	0	3.11	SCT	4	2000	777.58	991.3333
2024	5	3	10	100.4	71.6	39.81	4.20312	1.878963	200	4	0	3.11	SCT	4	2000	854.51	991.3333
2024	5	3	11	100.4	69.8	37.44	5.2539	2.348703	240	5	0	3.73	SCT	4	2000	891.46	990.3333
2024	5	3	12	100.4	69.8	37.44	4.20312	1.878963	180	4	0	3.73	SCT	4	2000	885.01	990.3333
2024	5	3	13	100.4	68	35.2	6.30468	2.818444	80	6	0	3.73	SCT	4	2000	855.86	989.3333
2024	5	3	14	100.4	73.4	42.3	10.5078	4.697407	80	10	0	3.73	SCT	4	2000	808.99	989.3333
2024	5	3	15	98.6	71.6	42.04	8.40624	3.757926	100	8	0	3.73	SCT	4	2000	737.26	988.3333
2024	5	3	16	98.6	71.6	42.04	8.40624	3.757926	100	8	0	3.73	SCT	4	2000	619.79	988.3333
2024	5	3	17	98.6	69.8	39.54	6.30468	2.818444	130	6	0	3.73	SCT	4	2000	432.59	989.3333
2024	5	3	18	96.8	68	39.27	6.30468	2.818444	140	6	0	3.73	SCT	4	2000	225.6	989.3333

2024	5	3	19	96.8	68	39.27	5.2539	2.348703	200	5	0	3.73	SCT	4	2000	0	990.3333
2024	5	3	20	91.4	69.8	49.36	5.2539	2.348703	280	5	0	3.73	SCT	4	2000	0	993.3333
2024	5	3	21	86	71.6	62.25	4.20312	1.878963	200	4	0	3.11	SCT	4	2000	0	993.3333
2024	5	3	22	89.6	71.6	55.53	4.20312	1.878963	250	4	0	3.11	SCT	4	2000	0	993.3333
2024	5	3	23	91.4	68	46.41	6.30468	2.818444	220	6	0	3.11	SCT	4	2000	0	992.3333
2024	5	4	0	93.2	68	43.88	5.2539	2.348703	180	5	0	3.11	SCT	4	2000	0	992.3333
2024	5	4	1	93.2	64.4	38.73	8.40624	3.757926	170	8	0	3.11	SCT	4	2000	0	992.3333
2024	5	4	2	95	68	41.5	5.2539	2.348703	220	5	0	3.11	SCT	4	2000	0	991.3333
2024	5	4	3	95	66.2	39	4.20312	1.878963	260	4	0	3.73	SCT	4	2000	0	991.3333
2024	5	4	4	96.8	66.2	36.9	4.20312	1.878963	200	4	0	3.73	SCT	4	2000	0	990.3333
2024	5	4	5	98.6	66.2	34.93	6.30468	2.818444	220	6	0	3.73	SCT	4	2000	0	988.3333
2024	5	4	6	100.4	66.2	33.08	4.20312	1.878963	140	4	0	3.73	SCT	4	2000	0	988.3333
2024	5	4	7	100.4	64.4	31.07	4.20312	1.878963	130	4	0	3.73	SCT	4	2000	0	987.3333
2024	5	4	8	102.2	64.4	29.43	5.2539	2.348703	150	5	0	3.73	SCT	4	2000	3.84	987.3333
2024	5	4	9	102.2	62.6	27.63	4.20312	1.878963	120	4	0	3.73	SCT	4	2000	37.72	987.3333
2024	5	4	10	102.2	62.6	27.63	4.20312	1.878963	150	4	0	3.73	SCT	4	2000	641.41	987.3333
2024	5	4	11	102.2	62.6	27.63	5.2539	2.348703	170	5	0	3.73	SCT	4	2000	777.58	994.3333
2024	5	4	12	86	69.8	58.55	4.20312	1.878963	230	4	0	3.73	SCT	4	2000	854.51	994.3333
2024	5	4	13	89.6	68	49.1	4.20312	1.878963	340	4	0	3.73	SCT	4	2000	891.46	994.3333
2024	5	4	14	91.4	69.8	49.36	3.15234	1.409222	300	3	0	3.73	SCT	4	2000	885.01	993.3333
2024	5	4	15	91.4	68	46.41	5.2539	2.348703	210	5	0	3.73	SCT	4	2000	855.86	993.3333
2024	5	4	16	93.2	69.8	46.67	4.20312	1.878963	230	4	0	3.73	SCT	4	2000	808.99	992.3333
2024	5	4	17	93.2	68	43.88	4.20312	1.878963	230	4	0	3.73	SCT	4	2000	737.26	992.3333
2024	5	4	18	95	69.8	44.14	4.20312	1.878963	240	4	0	3.73	SCT	4	2000	619.79	991.3333
2024	5	4	19	96.8	68	39.27	8.40624	3.757926	180	8	0	3.73	SCT	4	2000	432.59	990.3333
2024	5	4	20	98.6	68	37.17	7.35546	3.288185	170	7	0	4.35	SCT	4	2000	225.6	990.3333
2024	5	4	21	100.4	66.2	33.08	6.30468	2.818444	200	6	0	4.35	SCT	4	2000	0	989.3333
2024	5	4	22	100.4	66.2	33.08	5.2539	2.348703	180	5	0	4.35	SCT	4	2000	0	988.3333
2024	5	4	23	102.2	62.6	27.63	7.35546	3.288185	210	7	0	4.35	SCT	4	2000	0	988.3333
2024	5	5	0	102.2	64.4	29.43	8.40624	3.757926	190	8	0	4.35	SCT	4	2000	0	988.3333
2024	5	5	1	102.2	62.6	27.63	9.45702	4.227666	190	9	0	4.35	SCT	4	1800	0	988.3333
2024	5	5	2	102.2	62.6	27.63	8.40624	3.757926	200	8	0	4.35	SCT	4	1800	0	995

2024	5	5	3	80.6	71.6	74.11	3.15234	1.409222	220	3	0	3.73	SCT	4	2000	0	996
2024	5	5	4	82.4	71.6	69.9	3.15234	1.409222	80	3	0	3.73	SCT	4	2000	0	995
2024	5	5	5	87.8	66.2	48.84	3.15234	1.409222	60	3	0	4.35	SCT	4	2000	0	995
2024	5	5	6	89.6	68	49.1	3.15234	1.409222	240	3	0	4.35	SCT	4	2000	0	995
2024	5	5	7	89.6	69.8	52.23	3.15234	1.409222	290	3	0	4.35	SCT	4	2000	0	994.3333
2024	5	5	8	89.6	68	49.1	4.20312	1.878963	150	4	0	4.35	SCT	4	2000	0	993.3333
2024	5	5	9	91.4	68	46.41	4.20312	1.878963	180	4	0	4.35	SCT	4	2000	0	993.3333
2024	5	5	10	93.2	68	43.88	4.20312	1.878963	170	4	0	4.35	SCT	4	2000	3.84	993.3333
2024	5	5	11	95	68	41.5	5.2539	2.348703	200	5	0	4.35	SCT	4	2000	37.72	992.3333
2024	5	5	12	95	68	41.5	4.20312	1.878963	220	4	0	4.35	SCT	4	2000	641.41	992.3333
2024	5	5	13	95	64.4	36.63	6.30468	2.818444	200	6	0	4.35	SCT	4	2000	777.58	991.3333
2024	5	5	14	96.8	66.2	36.9	4.20312	1.878963	220	4	0	4.35	SCT	4	2000	854.51	991.3333
2024	5	5	15	96.8	66.2	36.9	4.20312	1.878963	260	4	0	4.35	SCT	4	2000	891.46	990.3333
2024	5	5	16	96.8	68	39.27	4.20312	1.878963	230	4	0	4.35	SCT	4	2000	885.01	990.3333
2024	5	5	17	96.8	66.2	36.9	4.20312	1.878963	210	4	0	4.35	SCT	4	2000	855.86	997
2024	5	5	18	78.8	71.6	78.62	8.40624	3.757926	10	8	0	3.11	SCT	4	2000	808.99	996
2024	5	5	19	82.4	71.6	69.9	5.2539	2.348703	330	5	0	3.73	SCT	4	2000	737.26	996
2024	5	5	20	84.2	69.8	62.03	5.2539	2.348703	320	5	0	3.73	SCT	4	2000	619.79	996
2024	5	5	21	87.8	68	51.98	4.20312	1.878963	350	4	0	4.35	SCT	4	2000	432.59	995
2024	5	5	22	87.8	68	51.98	4.20312	1.878963	350	4	0	4.35	SCT	4	2000	225.6	995
2024	5	5	23	87.8	71.6	58.78	4.20312	1.878963	340	4	0	4.35	SCT	4	1800	0	994.3333
2024	5	6	0	87.8	73.4	62.47	4.20312	1.878963	270	4	0	4.35	SCT	4	1800	0	994.3333
2024	5	6	1	87.8	71.6	58.78	4.20312	1.878963	280	4	0	4.35	SCT	4	1800	3.84	993.3333
2024	5	6	2	89.6	71.6	55.53	4.20312	1.878963	340	4	0	4.35	SCT	4	1800	37.72	992.3333
2024	5	6	3	91.4	68	46.41	3.15234	1.409222	30	3	0	4.35	SCT	4	1800	641.41	992.3333
2024	5	6	4	91.4	69.8	49.36	3.15234	1.409222	190	3	0	4.35	SCT	4	1800	777.58	991.3333
2024	5	6	5	95	68	41.5	3.15234	1.409222	310	3	0	4.35	SCT	4	1800	854.51	990.3333
2024	5	6	6	96.8	66.2	36.9	5.2539	2.348703	260	5	0	4.35	SCT	4	2000	891.46	990.3333
2024	5	6	7	96.8	66.2	36.9	4.20312	1.878963	300	4	0	4.97	SCT	4	2000	885.01	990.3333
2024	5	6	8	96.8	62.6	32.54	4.20312	1.878963	220	4	0	4.97	SCT	4	2000	855.86	990.3333
2024	5	6	9	96.8	62.6	32.54	4.20312	1.878963	290	4	0	4.97	SCT	4	2000	808.99	989.3333
2024	5	6	10	96.8	64.4	34.66	4.20312	1.878963	290	4	0	4.97	SCT	4	2000	737.26	994.3333

2024	5	6	11	86	75.2	70.27	3.15234	1.409222	110	3	0	3.11	SCT	4	2000	619.79	994.3333
2024	5	6	12	87.8	73.4	62.47	3.15234	1.409222	130	3	0	3.11	SCT	4	2000	432.59	994.3333
2024	5	6	13	91.4	71.6	52.48	3.15234	1.409222	170	3	0	3.11	SCT	4	2000	225.6	994.3333
2024	5	6	14	91.4	71.6	52.48	3.15234	1.409222	100	3	0	3.11	SCT	4	2000	0	993.3333
2024	5	6	15	91.4	71.6	52.48	5.2539	2.348703	100	5	0	3.11	SCT	4	2000	0	993.3333
2024	5	6	16	93.2	71.6	49.62	5.2539	2.348703	160	5	0	3.11	SCT	4	2000	0	992.3333
2024	5	6	17	93.2	71.6	49.62	6.30468	2.818444	70	6	0	3.11	SCT	4	2000	0	992.3333
2024	5	6	18	95	69.8	44.14	5.2539	2.348703	120	5	0	3.73	SCT	4	2000	0	991.3333
2024	5	6	19	95	68	41.5	5.2539	2.348703	80	5	0	3.73	SCT	4	2000	0	990.3333
2024	5	6	20	96.8	66.2	36.9	4.20312	1.878963	130	4	0	3.73	SCT	4	2000	0	990.3333
2024	5	6	21	93.2	69.8	46.67	10.5078	4.697407	80	10	0	3.73	SCT	4	2000	0	990.3333
2024	5	6	22	93.2	66.2	41.23	10.5078	4.697407	60	10	0	3.73	SCT	4	1800	0	989.3333
2024	5	6	23	96.8	66.2	36.9	6.30468	2.818444	80	6	0	3.73	SCT	4	2000	0	989.3333
2024	5	7	0	96.8	60.8	30.53	6.30468	2.818444	100	6	0	4.35	SCT	4	2000	0	989.3333
2024	5	7	1	96.8	62.6	32.54	5.2539	2.348703	120	5	0	4.35	SCT	4	2000	0	988.3333
2024	5	7	2	96.8	62.6	32.54	4.20312	1.878963	60	4	0	4.35	SCT	4	2000	3.84	989.3333
2024	5	7	3	95	62.6	34.39	3.15234	1.409222	70	3	0	4.35	SCT	4	2000	37.72	989.3333
2024	5	7	4	95	64.4	36.63	4.20312	1.878963	90	4	0	3.73	SCT	4	2000	641.41	990.3333
2024	5	7	5	93.2	66.2	41.23	4.20312	1.878963	100	4	0	3.73	SCT	4	2000	777.58	995
2024	5	7	6	80.6	77	88.83	4.20312	1.878963	170	4	0	3.11	SCT	4	2000	854.51	996
2024	5	7	7	84.2	77	79.04	5.2539	2.348703	210	5	0	3.11	SCT	4	2000	891.46	996
2024	5	7	8	86	77	74.61	4.20312	1.878963	230	4	0	3.11	SCT	4	2000	885.01	995
2024	5	7	9	86	75.2	70.27	6.30468	2.818444	180	6	0	3.11	SCT	4	2000	855.86	995
2024	5	7	10	87.8	75.2	66.35	5.2539	2.348703	240	5	0	3.11	SCT	4	2000	808.99	994.3333
2024	5	7	11	89.6	75.2	62.68	4.20312	1.878963	40	4	0	3.11	SCT	4	2000	737.26	994.3333
2024	5	7	12	89.6	73.4	59.01	4.20312	1.878963	120	4	0	3.11	SCT	4	2000	619.79	994.3333
2024	5	7	13	91.4	73.4	55.77	4.20312	1.878963	350	4	0	3.11	SCT	4	2000	432.59	993.3333
2024	5	7	14	91.4	71.6	52.48	5.2539	2.348703	150	5	0	3.73	SCT	4	2000	225.6	992.3333
2024	5	7	15	95	69.8	44.14	4.20312	1.878963	310	4	0	3.73	SCT	4	2000	0	992.3333
2024	5	7	16	95	69.8	44.14	4.20312	1.878963	340	4	0	3.73	SCT	4	2000	0	991.3333
2024	5	7	17	95	69.8	44.14	4.20312	1.878963	190	4	0	3.73	SCT	4	2000	0	989.3333
2024	5	7	18	98.6	68	37.17	6.30468	2.818444	310	6	0	4.35	SCT	4	2000	0	989.3333

2024	5	7	19	98.6	66.2	34.93	5.2539	2.348703	340	5	0	4.35	SCT	4	2000	0	989.3333
2024	5	7	20	96.8	69.8	41.77	8.40624	3.757926	110	8	0	4.35	SCT	4	2000	0	989.3333
2024	5	7	21	95	68	41.5	8.40624	3.757926	100	8	0	4.35	SCT	4	2000	0	989.3333
2024	5	7	22	95	68	41.5	6.30468	2.818444	120	6	0	4.35	SCT	4	2000	0	996
2024	5	7	23	86	75.2	70.27	2.10156	0.939481	40	2	0	3.11	SCT	4	2000	0	996
2024	5	8	0	87.8	75.2	66.35	4.20312	1.878963	120	4	0	3.73	SCT	4	2000	0	995
2024	5	8	1	89.6	71.6	55.53	6.30468	2.818444	190	6	0	3.73	SCT	4	2000	0	995
2024	5	8	2	91.4	71.6	52.48	3.15234	1.409222	190	3	0	3.73	SCT	4	2000	0	995
2024	5	8	3	93.2	71.6	49.62	3.15234	1.409222	170	3	0	3.73	SCT	4	2000	3.84	994.3333
2024	5	8	4	93.2	71.6	49.62	4.20312	1.878963	120	4	0	4.35	SCT	4	2000	37.72	994.3333
2024	5	8	5	93.2	69.8	46.67	3.15234	1.409222	130	3	0	4.35	SCT	4	2000	641.41	993.3333
2024	5	8	6	89.6	77	66.55	15.7617	7.04611	30	15	0	3.11	SCT	4	2000	777.58	993.3333
2024	5	8	7	80.6	78.8	94.27	16.8125	7.515851	30	16	0	2.49	SCT	4	2000	854.51	993.3333
2024	5	8	8	78.8	77	94.23	6.30468	2.818444	80	6	0	3.11	SCT	4	2000	891.46	993.3333
2024	5	8	9	80.6	78.8	94.27	6.30468	2.818444	80	6	0	3.11	SCT	4	2000	885.01	992.3333
2024	5	8	10	82.4	77	83.77	6.30468	2.818444	80	6	0	3.73	SCT	4	2000	855.86	992.3333
2024	5	8	11	80.6	78.8	94.27	3.15234	1.409222	80	3	0	4.35	SCT	4	2000	808.99	992.3333
2024	5	8	12	80.6	78.8	94.27	4.20312	1.878963	100	4	0	4.35	SCT	4	2000	737.26	992.3333
2024	5	8	13	80.6	78.8	94.27	3.15234	1.409222	120	3	0	3.73	SCT	4	2000	619.79	992.3333
2024	5	8	14	80.6	78.8	94.27	3.15234	1.409222	80	3	0	3.73	SCT	4	2000	432.59	996
2024	5	8	15	84.2	78.8	83.88	3.15234	1.409222	340	3	0	3.11	SCT	4	2000	225.6	996
2024	5	8	16	86	77	74.61	2.10156	0.939481	40	2	0	3.11	SCT	4	2000	0	996
2024	5	8	17	87.8	75.2	66.35	4.20312	1.878963	180	4	0	3.11	SCT	4	2000	0	996
2024	5	8	18	87.8	75.2	66.35	4.20312	1.878963	180	4	0	3.73	SCT	4	2000	0	996
2024	5	8	19	91.4	75.2	59.24	3.15234	1.409222	130	3	0	3.73	SCT	4	2000	0	995
2024	5	8	20	89.6	75.2	62.68	4.20312	1.878963	160	4	0	3.73	SCT	4	2000	0	995
2024	5	8	21	91.4	75.2	59.24	2.10156	0.939481	40	2	0	3.73	SCT	4	2000	0	994.3333
2024	5	8	22	91.4	73.4	55.77	2.10156	0.939481	40	2	0	3.73	SCT	4	2000	0	993.3333
2024	5	8	23	93.2	73.4	52.73	4.20312	1.878963	130	4	0	3.73	SCT	4	1800	0	992.3333
2024	5	9	0	91.4	68	46.41	11.5586	5.167148	80	11	0	3.73	SCT	4	1800	0	990.3333
2024	5	9	1	91.4	69.8	49.36	6.30468	2.818444	110	6	0	3.73	SCT	4	1800	0	990.3333
2024	5	9	2	93.2	71.6	49.62	5.2539	2.348703	110	5	0	4.35	SCT	4	1800	0	990.3333

2024	5	9	3	95	69.8	44.14	3.15234	1.409222	160	3	0	4.35	FEW	2	1000	0	990.3333
2024	5	9	4	95	68	41.5	3.15234	1.409222	170	3	0	4.35	FEW	2	1000	3.84	990.3333
2024	5	9	5	93.2	68	43.88	4.20312	1.878963	150	4	0	4.35	FEW	2	1000	37.72	995
2024	5	9	6	86	77	74.61	4.20312	1.878963	10	4	0	3.73	FEW	2	1000	641.41	995
2024	5	9	7	87.8	77	70.45	4.20312	1.878963	350	4	0	4.35	FEW	2	1000	777.58	995
2024	5	9	8	89.6	75.2	62.68	4.20312	1.878963	30	4	0	4.35	SCT	4	2000	854.51	995
2024	5	9	9	91.4	73.4	55.77	4.20312	1.878963	10	4	0	4.35	SCT	4	2000	891.46	994.3333
2024	5	9	10	91.4	73.4	55.77	5.2539	2.348703	310	5	0	4.35	SCT	4	2000	885.01	994.3333
2024	5	9	11	91.4	73.4	55.77	5.2539	2.348703	340	5	0	4.35	SCT	4	2000	855.86	994.3333
2024	5	9	12	89.6	73.4	59.01	5.2539	2.348703	60	5	0	3.11	FEW	2	1500	808.99	994.3333
2024	5	9	13	80.6	73.4	78.76	5.2539	2.348703	340	5	0	3.11	FEW	2	1500	737.26	993.3333
2024	5	9	14	82.4	78.8	88.9	4.20312	1.878963	240	4	0	3.73	FEW	2	1500	619.79	992.3333
2024	5	9	15	87.8	77	70.45	4.20312	1.878963	80	4	0	4.35	FEW	2	1500	432.59	991.3333
2024	5	9	16	91.4	73.4	55.77	3.15234	1.409222	130	3	0	4.35	SCT	4	2000	225.6	991.3333
2024	5	9	17	96.8	68	39.27	3.15234	1.409222	70	3	0	4.35	SCT	4	2000	0	990.3333
2024	5	9	18	95	71.6	46.93	10.5078	4.697407	110	10	0	4.35	SCT	4	2000	0	990.3333
2024	5	9	19	91.4	71.6	52.48	10.5078	4.697407	130	10	0	4.35	SCT	4	2000	0	990.3333
2024	5	9	20	89.6	73.4	59.01	8.40624	3.757926	120	8	0	4.35	SCT	4	2000	0	990.3333
2024	5	9	21	89.6	73.4	59.01	6.30468	2.818444	120	6	0	4.35	FEW	2	1500	0	990.3333
2024	5	9	22	89.6	73.4	59.01	6.30468	2.818444	140	6	0	4.35	FEW	2	1500	0	990.3333
2024	5	9	23	89.6	73.4	59.01	5.2539	2.348703	130	5	0	4.35	FEW	2	1500	0	990.3333
2024	5	10	0	87.8	73.4	62.47	4.20312	1.878963	160	4	0	4.35	FEW	2	1500	0	991.3333
2024	5	10	1	87.8	73.4	62.47	4.20312	1.878963	160	4	0	4.35	FEW	2	1500	0	992.3333
2024	5	10	2	87.8	75.2	66.35	6.30468	2.818444	160	6	0	4.35	FEW	2	1500	0	995
2024	5	10	3	84.2	77	79.04	3.15234	1.409222	130	3	0	3.11	SCT	4	2000	0	995
2024	5	10	4	86	77	74.61	3.15234	1.409222	160	3	0	3.11	SCT	4	2000	0	995
2024	5	10	5	87.8	77	70.45	4.20312	1.878963	280	4	0	3.11	SCT	4	2000	3.84	995
2024	5	10	6	87.8	75.2	66.35	3.15234	1.409222	120	3	0	3.11	SCT	4	2000	37.72	995
2024	5	10	7	89.6	71.6	55.53	4.20312	1.878963	80	4	0	3.11	SCT	4	2000	641.41	994.3333
2024	5	10	8	89.6	71.6	55.53	4.20312	1.878963	250	4	0	3.11	SCT	4	2000	777.58	994.3333
2024	5	10	9	89.6	71.6	55.53	4.20312	1.878963	100	4	0	3.11	SCT	4	2000	854.51	993.3333
2024	5	10	10	91.4	71.6	52.48	3.15234	1.409222	40	3	0	3.73	SCT	4	2000	891.46	992.3333

2024	5	10	11	93.2	69.8	46.67	3.15234	1.409222	170	3	0	3.73	SCT	4	2000	885.01	992.3333
2024	5	10	12	93.2	71.6	49.62	4.20312	1.878963	120	4	0	3.73	SCT	4	2000	855.86	991.3333
2024	5	10	13	93.2	71.6	49.62	10.5078	4.697407	70	10	0	3.73	SCT	4	2000	808.99	991.3333
2024	5	10	14	93.2	68	43.88	8.40624	3.757926	100	8	0	3.73	SCT	4	2000	737.26	990.3333
2024	5	10	15	89.6	71.6	55.53	12.6094	5.636888	110	12	0	3.73	SCT	4	2000	619.79	991.3333
2024	5	10	16	87.8	71.6	58.78	5.2539	2.348703	250	5	0	3.73	SCT	4	2000	432.59	991.3333
2024	5	10	17	84.2	73.4	70.08	8.40624	3.757926	160	8	0	3.73	SCT	4	2000	225.6	995
2024	5	10	18	82.4	75.2	78.9	4.20312	1.878963	340	4	0	3.11	SCT	4	2000	0	995
2024	5	10	19	84.2	75.2	74.44	4.20312	1.878963	340	4	0	3.11	SCT	4	2000	0	994.3333
2024	5	10	20	86	75.2	70.27	4.20312	1.878963	20	4	0	3.11	SCT	4	2000	0	994.3333
2024	5	10	21	87.8	73.4	62.47	3.15234	1.409222	350	3	0	3.11	SCT	4	2000	0	994.3333
2024	5	10	22	87.8	73.4	62.47	5.2539	2.348703	10	5	0	3.11	SCT	4	2000	0	994.3333
2024	5	10	23	91.4	73.4	55.77	8.40624	3.757926	20	8	0	3.11	SCT	4	2000	0	994.3333
2024	5	11	0	91.4	71.6	52.48	7.35546	3.288185	340	7	0	3.11	SCT	4	2000	0	993.3333
2024	5	11	1	93.2	71.6	49.62	6.30468	2.818444	340	6	0	3.11	SCT	4	2000	0	993.3333
2024	5	11	2	93.2	68	43.88	8.40624	3.757926	20	8	0	3.73	SCT	4	2000	0	992.3333
2024	5	11	3	95	66.2	39	5.2539	2.348703	10	5	0	3.73	SCT	4	2000	0	991.3333
2024	5	11	4	95	64.4	36.63	7.35546	3.288185	10	7	0	3.73	FEW	2	2000	0	991.3333
2024	5	11	5	95	62.6	34.39	10.5078	4.697407	340	10	0	3.73	SCT	4	2000	0	990.3333
2024	5	11	6	98.6	57.2	25.41	5.2539	2.348703	50	5	0	3.73	SCT	4	2000	3.84	990.3333
2024	5	11	7	95	66.2	39	10.5078	4.697407	120	10	0	3.73	SCT	4	2000	37.72	991.3333
2024	5	11	8	89.6	68	49.1	8.40624	3.757926	110	8	0	3.73	SCT	4	2000	641.41	991.3333
2024	5	11	9	87.8	69.8	55.29	6.30468	2.818444	110	6	0	3.73	SCT	4	2000	777.58	991.3333
2024	5	11	10	87.8	69.8	55.29	8.40624	3.757926	120	8	0	3.73	SCT	4	2000	854.51	996
2024	5	11	11	77	77	100	3.15234	1.409222	320	3	0	2.49	FEW	2	2000	891.46	997
2024	5	11	12	77	77	100	3.15234	1.409222	340	3	0	2.49	FEW	2	2000	885.01	996
2024	5	11	13	80.6	77	88.83	3.15234	1.409222	160	3	0	2.49	FEW	2	2000	855.86	996
2024	5	11	14	82.4	78.8	88.9	3.15234	1.409222	280	3	0	3.11	FEW	2	2000	808.99	995
2024	5	11	15	82.4	77	83.77	3.15234	1.409222	190	3	0	3.11	FEW	2	2000	737.26	995
2024	5	11	16	84.2	75.2	74.44	3.15234	1.409222	170	3	0	3.11	FEW	2	2000	619.79	994.3333
2024	5	11	17	84.2	73.4	70.08	3.15234	1.409222	140	3	0	3.11	FEW	2	2000	432.59	994.3333
2024	5	11	18	87.8	75.2	66.35	3.15234	1.409222	300	3	0	3.11	FEW	2	2000	225.6	993.3333

2024	5	11	19	87.8	73.4	62.47	3.15234	1.409222	40	3	0	3.11	FEW	2	2000	0	993.3333
2024	5	11	20	100.4	73.4	42.3	3.15234	1.409222	40	3	0	3.73	FEW	2	2000	0	992.3333
2024	5	11	21	100.4	71.6	39.81	3.15234	1.409222	40	3	0	3.73	FEW	2	2000	0	991.3333
2024	5	11	22	91.4	73.4	55.77	5.2539	2.348703	300	5	0	3.73	FEW	2	2000	0	991.3333
2024	5	11	23	93.2	71.6	49.62	3.15234	1.409222	320	3	0	4.35	FEW	2	2000	0	990.3333
2024	5	12	0	93.2	69.8	46.67	4.20312	1.878963	330	4	0	4.35	FEW	2	2000	0	990.3333
2024	5	12	1	91.4	71.6	52.48	5.2539	2.348703	150	5	0	4.35	FEW	2	2000	0	991.3333
2024	5	12	2	89.6	73.4	59.01	6.30468	2.818444	130	6	0	4.35	FEW	2	2000	0	994.3333
2024	5	12	3	82.4	78.8	88.9	3.15234	1.409222	50	3	0	1.86	SCT	4	2000	0	994.3333
2024	5	12	4	84.2	78.8	83.88	3.15234	1.409222	90	3	0	1.86	SCT	4	2000	0	994.3333
2024	5	12	5	86	77	74.61	3.15234	1.409222	260	3	0	2.49	SCT	4	2000	0	994.3333
2024	5	12	6	86	77	74.61	3.15234	1.409222	350	3	0	3.11	SCT	4	2000	0	993.3333
2024	5	12	7	87.8	77	70.45	5.2539	2.348703	190	5	0	3.11	SCT	4	2000	3.84	993.3333
2024	5	12	8	82.4	77	83.77	8.40624	3.757926	90	8	0	3.11	SCT	4	2000	37.72	993.3333
2024	5	12	9	77	77	100	10.5078	4.697407	70	10	0	2.49	SCT	4	2000	641.41	993.3333
2024	5	12	10	75.2	75.2	100	8.40624	3.757926	100	8	0	3.11	FEW	2	2000	777.58	992.3333
2024	5	12	11	77	75.2	94.19	6.30468	2.818444	220	6	0	3.11	FEW	2	2000	854.51	991.3333
2024	5	12	12	77	77	100	4.20312	1.878963	170	4	0	3.11	FEW	2	2000	891.46	992.3333
2024	5	12	13	80.6	78.8	94.27	4.20312	1.878963	60	4	0	3.11	SCT	4	2000	885.01	991.3333
2024	5	12	14	80.6	77	88.83	6.30468	2.818444	10	6	0	3.11	SCT	4	2000	855.86	991.3333
2024	5	12	15	82.4	77	83.77	6.30468	2.818444	10	6	0	3.11	SCT	4	2000	808.99	991.3333
2024	5	12	16	80.6	77	88.83	6.30468	2.818444	10	6	0	3.73	SCT	4	2000	737.26	991.3333
2024	5	12	17	80.6	75.2	83.66	5.2539	2.348703	40	5	0	3.73	SCT	4	2000	619.79	991.3333
2024	5	12	18	80.6	77	88.83	6.30468	2.818444	10	6	0	3.73	SCT	4	2000	432.59	993.3333
2024	5	12	19	80.6	78.8	94.27	6.30468	2.818444	20	6	0	3.11	SCT	4	2000	225.6	993.3333
2024	5	12	20	84.2	78.8	83.88	3.15234	1.409222	230	3	0	3.11	SCT	4	2000	0	993.3333
2024	5	12	21	86	75.2	70.27	3.15234	1.409222	170	3	0	3.11	SCT	4	2000	0	992.3333
2024	5	12	22	87.8	75.2	66.35	3.15234	1.409222	280	3	0	3.11	SCT	4	2000	0	992.3333
2024	5	12	23	87.8	73.4	62.47	3.15234	1.409222	230	3	0	3.11	SCT	4	2000	0	992.3333
2024	5	13	0	89.6	73.4	59.01	4.20312	1.878963	280	4	0	3.11	SCT	4	2000	0	990.3333
2024	5	13	1	91.4	73.4	55.77	4.20312	1.878963	80	4	0	3.11	SCT	4	2000	0	990.3333
2024	5	13	2	91.4	73.4	55.77	3.15234	1.409222	80	3	0	3.11	SCT	4	2000	0	989.3333

2024	5	13	3	91.4	73.4	55.77	4.20312	1.878963	160	4	0	3.11	SCT	4	2000	0	989.3333
2024	5	13	4	91.4	73.4	55.77	6.30468	2.818444	180	6	0	3.73	SCT	4	2000	0	989.3333
2024	5	13	5	91.4	73.4	55.77	5.2539	2.348703	80	5	0	3.73	SCT	4	2000	0	989.3333
2024	5	13	6	86	75.2	70.27	10.5078	4.697407	10	10	0	3.73	SCT	4	2000	0	989.3333
2024	5	13	7	82.4	78.8	88.9	10.5078	4.697407	50	10	0	3.73	SCT	4	2000	0	988.3333
2024	5	13	8	77	77	100	10.5078	4.697407	60	10	0	3.11	SCT	4	2000	3.84	988.3333
2024	5	13	9	77	77	100	6.30468	2.818444	50	6	0	3.11	SCT	4	2000	37.72	988.3333
2024	5	13	10	80.6	78.8	94.27	6.30468	2.818444	40	6	0	3.73	SCT	4	2000	641.41	988.3333
2024	5	13	11	82.4	77	83.77	5.2539	2.348703	30	5	0	3.73	SCT	4	2000	777.58	988.3333
2024	5	13	12	82.4	78.8	88.9	5.2539	2.348703	320	5	0	3.73	SCT	4	2000	854.51	991.3333
2024	5	13	13	82.4	77	83.77	3.15234	1.409222	300	3	0	3.11	SCT	4	2000	891.46	992.3333
2024	5	13	14	84.2	78.8	83.88	3.15234	1.409222	90	3	0	3.11	SCT	4	2000	885.01	991.3333
2024	5	13	15	86	78.8	79.18	3.15234	1.409222	340	3	0	3.11	SCT	4	2000	855.86	991.3333
2024	5	13	16	87.8	78.8	74.77	3.15234	1.409222	210	3	0	3.11	SCT	4	2000	808.99	991.3333
2024	5	13	17	89.6	77	66.55	5.2539	2.348703	210	5	0	3.11	SCT	4	2000	737.26	990.3333
2024	5	13	18	89.6	75.2	62.68	5.2539	2.348703	240	5	0	3.11	SCT	4	2000	619.79	990.3333
2024	5	13	19	89.6	75.2	62.68	3.15234	1.409222	340	3	0	3.11	SCT	4	2000	432.59	989.3333
2024	5	13	20	89.6	77	66.55	7.35546	3.288185	20	7	0	3.11	SCT	4	2000	225.6	988.3333
2024	5	13	21	89.6	75.2	62.68	5.2539	2.348703	60	5	0	3.11	SCT	4	2000	0	987.3333
2024	5	13	22	77	77	100	6.30468	2.818444	130	6	0	3.11	SCT	4	2000	0	987.3333
2024	5	13	23	77	77	100	5.2539	2.348703	80	5	0	3.11	SCT	4	2000	0	987.3333
2024	5	14	0	77	77	100	4.20312	1.878963	300	4	0	3.11	SCT	4	2000	0	987.3333
2024	5	14	1	77	77	100	3.15234	1.409222	260	3	0	3.11	SCT	4	2000	0	987.3333
2024	5	14	2	78.8	77	94.23	4.20312	1.878963	290	4	0	3.11	SCT	4	2000	0	987.3333
2024	5	14	3	78.8	78.8	100	3.15234	1.409222	290	3	0	3.11	SCT	4	2000	0	988.3333
2024	5	14	4	77	77	100	4.20312	1.878963	300	4	0	3.11	SCT	4	2000	0	991.3333
2024	5	14	5	80.6	80.6	100	3.15234	1.409222	270	3	0	3.11	SCT	4	2000	0	991.3333
2024	5	14	6	82.4	78.8	88.9	3.15234	1.409222	80	3	0	3.11	SCT	4	2000	0	991.3333
2024	5	14	7	82.4	77	83.77	3.15234	1.409222	10	3	0	3.11	SCT	4	2000	0	991.3333
2024	5	14	8	84.2	77	79.04	3.15234	1.409222	100	3	0	3.11	SCT	4	2000	0	991.3333
2024	5	14	9	86	77	74.61	3.15234	1.409222	80	3	0	3.11	SCT	4	2000	3.84	991.3333
2024	5	14	10	86	77	74.61	3.15234	1.409222	240	3	0	3.11	SCT	4	2000	37.72	990.3333

2024	5	14	11	86	77	74.61	3.15234	1.409222	300	3	0	3.11	SCT	4	2000	641.41	990.3333
2024	5	14	12	86	77	74.61	3.15234	1.409222	300	3	0	3.11	SCT	4	2000	777.58	989.3333
2024	5	14	13	89.6	77	66.55	5.2539	2.348703	330	5	0	3.11	SCT	4	2000	854.51	988.3333
2024	5	14	14	80.6	78.8	94.27	3.15234	1.409222	270	3	0	3.11	SCT	4	2000	891.46	987.3333
2024	5	14	15	80.6	78.8	94.27	4.20312	1.878963	210	4	0	3.11	SCT	4	2000	885.01	988.3333
2024	5	14	16	80.6	78.8	94.27	3.15234	1.409222	350	3	0	3.11	SCT	4	2000	855.86	987.3333
2024	5	14	17	75.2	75.2	100	4.20312	1.878963	230	4	0	3.11	SCT	4	2000	808.99	987.3333
2024	5	14	18	77	77	100	3.15234	1.409222	220	3	0	3.11	SCT	4	2000	737.26	988.3333
2024	5	14	19	77	75.2	94.19	5.2539	2.348703	140	5	0	2.49	SCT	4	2000	619.79	991.3333
2024	5	14	20	77	75.2	94.19	3.15234	1.409222	180	3	0	3.11	SCT	4	2000	432.59	991.3333
2024	5	14	21	80.6	78.8	94.27	3.15234	1.409222	300	3	0	3.11	SCT	4	2000	225.6	991.3333
2024	5	14	22	82.4	78.8	88.9	4.20312	1.878963	150	4	0	3.11	SCT	4	2000	0	990.3333
2024	5	14	23	82.4	80.6	94.31	4.20312	1.878963	170	4	0	3.11	SCT	4	2000	0	990.3333
2024	5	15	0	84.2	78.8	83.88	3.15234	1.409222	250	3	0	3.11	SCT	4	2000	0	989.3333
2024	5	15	1	86	78.8	79.18	3.15234	1.409222	290	3	0	3.11	SCT	4	2000	0	989.3333
2024	5	15	2	86	80.6	83.99	4.20312	1.878963	250	4	0	3.11	SCT	4	2000	0	988.3333
2024	5	15	3	86	78.8	79.18	5.2539	2.348703	190	5	0	3.11	SCT	4	2000	0	988.3333
2024	5	15	4	86	78.8	79.18	5.2539	2.348703	190	5	0	3.11	SCT	4	2000	0	988.3333
2024	5	15	5	80.6	80.6	100	4.20312	1.878963	120	4	0	3.11	SCT	4	2000	0	988.3333
2024	5	15	6	77	77	100	6.30468	2.818444	140	6	0	3.11	SCT	4	2000	0	988.3333
2024	5	15	7	77	77	100	6.30468	2.818444	160	6	0	3.11	SCT	4	2000	0	988.3333
2024	5	15	8	77	75.2	94.19	4.20312	1.878963	130	4	0	3.11	SCT	4	2000	0	988.3333
2024	5	15	9	77	75.2	94.19	3.15234	1.409222	330	3	0	3.11	SCT	4	2000	0	988.3333
2024	5	15	10	75.2	77	22.6	4.20312	1.878963	350	4	0	3.11	SCT	4	2000	3.84	988.3333
2024	5	15	11	75.2	75.2	100	5.2539	2.348703	340	5	0	3.11	SCT	4	2000	37.72	987.3333
2024	5	15	12	75.2	75.2	100	4.20312	1.878963	340	4	0	3.11	SCT	4	2000	641.41	989.3333
2024	5	15	13	80.6	80.6	100	6.30468	2.818444	20	6	0	3.11	SCT	4	2000	777.58	990.3333
2024	5	15	14	80.6	78.8	94.27	3.15234	1.409222	120	3	0	3.11	SCT	4	2000	854.51	990.3333
2024	5	15	15	80.6	80.6	100	3.15234	1.409222	120	3	0	1.86	SCT	4	2000	891.46	990.3333
2024	5	15	16	80.6	80.6	100	3.15234	1.409222	90	3	0	1.86	SCT	4	2000	885.01	989.3333
2024	5	15	17	82.4	82.4	100	3.15234	1.409222	140	3	0	1.86	SCT	4	2000	855.86	989.3333
2024	5	15	18	86	80.6	83.99	3.15234	1.409222	40	3	0	3.11	SCT	4	2000	808.99	989.3333

2024	5	15	19	86	80.6	83.99	3.15234	1.409222	240	3	0	3.11	SCT	4	2000	737.26	988.3333
2024	5	15	20	87.8	78.8	74.77	3.15234	1.409222	250	3	0	3.11	SCT	4	2000	619.79	988.3333
2024	5	15	21	87.8	80.6	79.31	3.15234	1.409222	300	3	0	3.73	SCT	4	2000	432.59	987.3333
2024	5	15	22	89.6	77	66.55	10.5078	4.697407	10	10	0	4.35	SCT	4	2000	225.6	987.3333
2024	5	15	23	89.6	77	66.55	7.35546	3.288185	340	7	0	4.35	SCT	4	1800	0	986.3333
2024	5	16	0	89.6	77	66.55	5.2539	2.348703	350	5	0	4.97	SCT	4	1800	0	986.3333
2024	5	16	1	89.6	77	66.55	5.2539	2.348703	340	5	0	4.97	SCT	4	2000	0	985.3333
2024	5	16	2	89.6	75.2	62.68	9.45702	4.227666	360	9	0	4.97	SCT	4	2000	0	984.3333
2024	5	16	3	91.4	77	62.9	3.15234	1.409222	340	3	0	4.97	SCT	4	2000	0	984.3333
2024	5	16	4	91.4	77	62.9	6.30468	2.818444	360	6	0	4.97	SCT	4	2000	0	985.3333
2024	5	16	5	89.6	78.8	70.63	8.40624	3.757926	150	8	0	4.97	SCT	4	2000	0	985.3333
2024	5	16	6	89.6	78.8	70.63	5.2539	2.348703	130	5	0	4.97	SCT	4	2000	0	989.3333
2024	5	16	7	78.8	77	94.23	2.10156	0.939481	40	2	0	3.11	SCT	4	2000	0	990.3333
2024	5	16	8	80.6	78.8	94.27	2.10156	0.939481	40	2	0	3.11	SCT	4	2000	0	989.3333
2024	5	16	9	84.2	80.6	88.98	6.30468	2.818444	20	6	0	3.11	SCT	4	2000	0	989.3333
2024	5	16	10	84.2	78.8	83.88	6.30468	2.818444	20	6	0	3.11	SCT	4	2000	0	988.3333
2024	5	16	11	86	80.6	83.99	2.10156	0.939481	40	2	0	3.11	SCT	4	2000	3.84	988.3333
2024	5	16	12	86	80.6	83.99	2.10156	0.939481	40	2	0	3.11	SCT	4	2000	37.72	987.3333
2024	5	16	13	86	80.6	83.99	2.10156	0.939481	40	2	0	3.11	SCT	4	2000	641.41	987.3333
2024	5	16	14	86	80.6	83.99	4.20312	1.878963	260	4	0	3.11	SCT	4	2000	777.58	986.3333
2024	5	16	15	86	80.6	83.99	4.20312	1.878963	210	4	0	3.11	SCT	4	2000	854.51	986.3333
2024	5	16	16	86	82.4	89.06	4.20312	1.878963	210	4	0	3.11	SCT	4	2000	891.46	986.3333
2024	5	16	17	87.8	80.6	79.31	6.30468	2.818444	180	6	0	3.73	SCT	4	2000	885.01	985.3333
2024	5	16	18	86	80.6	83.99	4.20312	1.878963	190	4	0	3.73	SCT	4	2000	855.86	985.3333
2024	5	16	19	86	82.4	89.06	4.20312	1.878963	160	4	0	3.73	SCT	4	2000	808.99	985.3333
2024	5	16	20	86	82.4	89.06	6.30468	2.818444	190	6	0	3.73	SCT	4	2000	737.26	985.3333
2024	5	16	21	86	80.6	83.99	3.15234	1.409222	160	3	0	3.73	SCT	4	1800	619.79	988.3333
2024	5	16	22	84.2	82.4	94.35	6.30468	2.818444	20	6	0	3.11	SCT	4	1800	432.59	988.3333
2024	5	16	23	84.2	82.4	94.35	2.10156	0.939481	40	2	0	1.86	SCT	4	1800	225.6	988.3333
2024	5	17	0	86	82.4	89.06	2.10156	0.939481	40	2	0	2.49	SCT	4	1800	0	988.3333
2024	5	17	1	86	80.6	83.99	2.10156	0.939481	40	2	0	3.11	SCT	4	1800	0	987.3333
2024	5	17	2	87.8	80.6	79.31	3.15234	1.409222	240	3	0	3.11	SCT	4	1800	0	987.3333

2024	5	17	3	89.6	80.6	74.93	3.15234	1.409222	10	3	0	3.11	SCT	4	1800	0	987.3333
2024	5	17	4	89.6	80.6	74.93	4.20312	1.878963	210	4	0	3.11	SCT	4	2000	0	987.3333
2024	5	17	5	89.6	78.8	70.63	2.10156	0.939481	40	2	0	3.11	SCT	4	2000	0	987.3333
2024	5	17	6	89.6	80.6	74.93	4.20312	1.878963	230	4	0	3.11	SCT	4	2000	0	986.3333
2024	5	17	7	91.4	80.6	70.81	3.15234	1.409222	230	3	0	3.11	SCT	4	2000	0	986.3333
2024	5	17	8	87.8	82.4	84.1	6.30468	2.818444	90	6	0	3.11	SCT	4	2000	0	985.3333
2024	5	17	9	86	82.4	89.06	4.20312	1.878963	140	4	0	3.11	SCT	4	2000	0	984.3333
2024	5	17	10	86	80.6	83.99	4.20312	1.878963	140	4	0	3.11	SCT	4	2000	0	984.3333
2024	5	17	11	86	80.6	83.99	3.15234	1.409222	190	3	0	3.11	SCT	4	2000	0	985.3333
2024	5	17	12	86	78.8	79.18	3.15234	1.409222	160	3	0	3.11	SCT	4	2000	3.84	985.3333
2024	5	17	13	84.2	80.6	88.98	4.20312	1.878963	190	4	0	3.11	SCT	4	2000	37.72	988.3333
2024	5	17	14	80.6	75.2	83.66	6.30468	2.818444	330	6	0	3.73	SCT	4	2000	641.41	989.3333
2024	5	17	15	82.4	75.2	78.9	4.20312	1.878963	330	4	0	3.73	SCT	4	2000	777.58	989.3333
2024	5	17	16	82.4	75.2	78.9	3.15234	1.409222	280	3	0	3.73	SCT	4	2000	854.51	989.3333
2024	5	17	17	82.4	73.4	74.28	4.20312	1.878963	320	4	0	3.73	SCT	4	2000	891.46	989.3333
2024	5	17	18	84.2	73.4	70.08	3.15234	1.409222	290	3	0	3.73	SCT	4	2000	885.01	989.3333
2024	5	17	19	86	73.4	66.15	4.20312	1.878963	290	4	0	3.73	SCT	4	2000	855.86	988.3333
2024	5	17	20	86	73.4	66.15	3.15234	1.409222	330	3	0	3.73	SCT	4	1800	808.99	988.3333
2024	5	17	21	87.8	73.4	62.47	3.15234	1.409222	300	3	0	3.73	SCT	4	2000	737.26	988.3333
2024	5	17	22	89.6	73.4	59.01	6.30468	2.818444	310	6	0	3.73	SCT	4	2000	619.79	987.3333
2024	5	17	23	89.6	73.4	59.01	3.15234	1.409222	290	3	0	3.73	SCT	4	2000	432.59	987.3333
2024	5	18	0	91.4	73.4	55.77	6.30468	2.818444	310	6	0	3.73	SCT	4	2000	225.6	987.3333
2024	5	18	1	91.4	73.4	55.77	5.2539	2.348703	300	5	0	3.73	SCT	4	2000	0	987.3333
2024	5	18	2	91.4	73.4	55.77	4.20312	1.878963	250	4	0	3.73	SCT	4	2000	0	986.3333
2024	5	18	3	91.4	73.4	55.77	4.20312	1.878963	310	4	0	3.73	SCT	4	2000	0	986.3333
2024	5	18	4	89.6	73.4	59.01	5.2539	2.348703	280	5	0	3.73	SCT	4	2000	0	986.3333
2024	5	18	5	89.6	75.2	62.68	6.30468	2.818444	240	6	0	3.73	SCT	4	2000	0	986.3333
2024	5	18	6	87.8	77	70.45	6.30468	2.818444	220	6	0	3.73	SCT	4	2000	0	986.3333
2024	5	18	7	86	77	74.61	5.2539	2.348703	220	5	0	3.73	SCT	4	2000	0	990.3333
2024	5	18	8	80.6	77	88.83	2.10156	0.939481	40	2	0	3.73	SCT	4	2000	0	991.3333
2024	5	18	9	84.2	77	79.04	2.10156	0.939481	40	2	0	3.73	SCT	4	2000	0	990.3333
2024	5	18	10	86	73.4	66.15	2.10156	0.939481	40	2	0	3.73	SCT	4	2000	0	990.3333

2024	5	18	11	86	73.4	66.15	3.15234	1.409222	230	3	0	3.73	SCT	4	2000	0	990.3333
2024	5	18	12	87.8	71.6	58.78	3.15234	1.409222	200	3	0	3.73	SCT	4	2000	0	990.3333
2024	5	18	13	87.8	71.6	58.78	3.15234	1.409222	230	3	0	3.73	SCT	4	2000	3.84	990.3333
2024	5	18	14	89.6	71.6	55.53	5.2539	2.348703	200	5	0	3.73	SCT	4	2000	37.72	989.3333
2024	5	18	15	89.6	71.6	55.53	3.15234	1.409222	240	3	0	3.73	SCT	4	2000	641.41	988.3333
2024	5	18	16	91.4	71.6	52.48	3.15234	1.409222	220	3	0	3.73	SCT	4	2000	777.58	987.3333
2024	5	18	17	93.2	71.6	49.62	6.30468	2.818444	290	6	0	3.73	SCT	4	2000	854.51	986.3333
2024	5	18	18	93.2	69.8	46.67	10.5078	4.697407	290	10	0	3.73	SCT	4	2000	891.46	986.3333
2024	5	18	19	93.2	69.8	46.67	8.40624	3.757926	300	8	0	3.73	SCT	4	2000	885.01	987.3333
2024	5	18	20	91.4	69.8	49.36	6.30468	2.818444	300	6	0	3.73	SCT	4	2000	855.86	986.3333
2024	5	18	21	91.4	71.6	52.48	6.30468	2.818444	290	6	0	3.73	SCT	4	2000	808.99	986.3333
2024	5	18	22	89.6	71.6	55.53	8.40624	3.757926	280	8	0	3.73	SCT	4	2000	737.26	990.3333
2024	5	18	23	80.6	77	88.83	6.30468	2.818444	200	6	0	3.11	SCT	4	2000	619.79	990.3333
2024	5	19	0	84.2	77	79.04	3.15234	1.409222	170	3	0	3.11	SCT	4	2000	432.59	990.3333
2024	5	19	1	84.2	77	79.04	5.2539	2.348703	180	5	0	3.11	SCT	4	2000	225.6	990.3333
2024	5	19	2	86	77	74.61	3.15234	1.409222	240	3	0	3.11	SCT	4	2000	0	990.3333
2024	5	19	3	86	75.2	70.27	3.15234	1.409222	240	3	0	3.11	SCT	4	2000	0	990.3333
2024	5	19	4	89.6	75.2	62.68	4.20312	1.878963	240	4	0	3.11	SCT	4	2000	0	990.3333
2024	5	19	5	89.6	73.4	59.01	3.15234	1.409222	290	3	0	3.73	SCT	4	2000	0	989.3333
2024	5	19	6	91.4	71.6	52.48	3.15234	1.409222	310	3	0	3.73	SCT	4	2000	0	988.3333
2024	5	19	7	95	68	41.5	6.30468	2.818444	330	6	0	4.35	SCT	4	2000	0	987.3333
2024	5	19	8	95	66.2	39	8.40624	3.757926	290	8	0	4.35	SCT	4	2000	0	987.3333
2024	5	19	9	95	69.8	44.14	7.35546	3.288185	300	7	0	4.35	SCT	4	2000	0	987.3333
2024	5	19	10	95	69.8	44.14	8.40624	3.757926	300	8	0	4.35	SCT	4	2000	0	987.3333
2024	5	19	11	95	71.6	46.93	4.20312	1.878963	290	4	0	4.35	SCT	4	2000	0	987.3333
2024	5	19	12	93.2	69.8	46.67	5.2539	2.348703	290	5	0	4.35	SCT	4	2000	0	987.3333
2024	5	19	13	93.2	69.8	46.67	6.30468	2.818444	290	6	0	4.35	SCT	4	2000	0	991.3333
2024	5	19	14	84.2	73.4	70.08	6.30468	2.818444	20	6	0	3.11	SCT	4	2000	3.84	992.3333
2024	5	19	15	86	69.8	58.55	3.15234	1.409222	330	3	0	3.73	SCT	4	2000	37.72	991.3333
2024	5	19	16	89.6	69.8	52.23	3.15234	1.409222	240	3	0	3.73	SCT	4	2000	641.41	991.3333
2024	5	19	17	89.6	69.8	52.23	5.2539	2.348703	210	5	0	4.35	SCT	4	2000	777.58	990.3333
2024	5	19	18	89.6	69.8	52.23	4.20312	1.878963	310	4	0	4.35	SCT	4	2000	854.51	990.3333

2024	5	19	19	91.4	69.8	49.36	6.30468	2.818444	300	6	0	4.35	SCT	4	2000	891.46	989.3333
2024	5	19	20	93.2	69.8	46.67	5.2539	2.348703	260	5	0	4.35	SCT	4	2000	885.01	989.3333
2024	5	19	21	93.2	71.6	49.62	6.30468	2.818444	240	6	0	4.35	SCT	4	1800	855.86	989.3333
2024	5	19	22	95	71.6	46.93	5.2539	2.348703	310	5	0	4.35	SCT	4	1800	808.99	988.3333
2024	5	19	23	95	71.6	46.93	5.2539	2.348703	270	5	0	4.35	SCT	4	1800	737.26	988.3333
2024	5	20	0	95	71.6	46.93	7.35546	3.288185	220	7	0	4.35	SCT	4	1800	619.79	987.3333
2024	5	20	1	93.2	71.6	49.62	4.20312	1.878963	250	4	0	4.35	FEW	4	1000	432.59	987.3333
2024	5	20	2	93.2	71.6	49.62	4.20312	1.878963	330	4	0	4.35	FEW	4	1000	225.6	987.3333
2024	5	20	3	93.2	73.4	52.73	4.20312	1.878963	240	4	0	4.35	FEW	4	1000	0	988.3333
2024	5	20	4	91.4	73.4	55.77	4.20312	1.878963	260	4	0	4.35	FEW	4	1000	0	991.3333
2024	5	20	5	80.6	77	88.83	3.15234	1.409222	300	3	0	3.11	FEW	4	1000	0	991.3333
2024	5	20	6	84.2	77	79.04	3.15234	1.409222	240	3	0	3.11	SCT	4	2000	0	991.3333
2024	5	20	7	86	77	74.61	3.15234	1.409222	300	3	0	3.73	SCT	4	2000	0	990.3333
2024	5	20	8	87.8	77	70.45	4.20312	1.878963	290	4	0	3.73	SCT	4	2000	0	990.3333
2024	5	20	9	87.8	75.2	66.35	4.20312	1.878963	320	4	0	3.73	SCT	4	2000	0	990.3333
2024	5	20	10	89.6	75.2	62.68	4.20312	1.878963	300	4	0	4.35	FEW	4	1500	0	989.3333
2024	5	20	11	91.4	75.2	59.24	6.30468	2.818444	300	6	0	4.35	FEW	4	1500	0	989.3333
2024	5	20	12	91.4	75.2	59.24	7.35546	3.288185	270	7	0	4.97	FEW	4	1500	0	989.3333
2024	5	20	13	93.2	75.2	56.01	6.30468	2.818444	290	6	0	4.97	FEW	4	1500	0	988.3333
2024	5	20	14	95	73.4	49.87	6.30468	2.818444	280	6	0	4.97	SCT	4	2000	0	988.3333
2024	5	20	15	95	73.4	49.87	7.35546	3.288185	310	7	0	4.97	SCT	4	2000	3.84	987.3333
2024	5	20	16	95	73.4	49.87	6.30468	2.818444	280	6	0	4.97	SCT	4	2000	37.72	987.3333
2024	5	20	17	96.8	71.6	44.41	6.30468	2.818444	260	6	0	4.97	SCT	4	2000	641.41	987.3333
2024	5	20	18	96.8	69.8	41.77	4.20312	1.878963	330	4	0	4.97	SCT	4	2000	777.58	986.3333
2024	5	20	19	96.8	71.6	44.41	4.20312	1.878963	300	4	0	4.97	FEW	4	1500	854.51	986.3333
2024	5	20	20	96.8	71.6	44.41	4.20312	1.878963	280	4	0	4.97	FEW	4	1500	891.46	986.3333
2024	5	20	21	95	71.6	46.93	6.30468	2.818444	280	6	0	4.97	FEW	4	1500	885.01	987.3333
2024	5	20	22	95	71.6	46.93	4.20312	1.878963	280	4	0	4.35	FEW	4	1500	855.86	992.3333
2024	5	20	23	82.4	78.8	88.9	3.15234	1.409222	250	3	0	3.11	FEW	4	1500	808.99	992.3333
2024	5	21	0	86	78.8	79.18	3.15234	1.409222	340	3	0	3.11	FEW	4	1500	737.26	991.3333
2024	5	21	1	89.6	75.2	62.68	4.20312	1.878963	320	4	0	3.73	SCT	4	2000	619.79	991.3333
2024	5	21	2	89.6	75.2	62.68	6.30468	2.818444	290	6	0	3.73	SCT	4	2000	432.59	991.3333

2024	5	21	3	91.4	73.4	55.77	5.2539	2.348703	310	5	0	4.35	SCT	4	2000	225.6	990.3333
2024	5	21	4	93.2	75.2	56.01	3.15234	1.409222	240	3	0	4.35	SCT	4	2000	0	990.3333
2024	5	21	5	93.2	75.2	56.01	4.20312	1.878963	240	4	0	4.35	SCT	4	2000	0	989.3333
2024	5	21	6	95	73.4	49.87	6.30468	2.818444	270	6	0	4.97	SCT	4	2000	0	989.3333
2024	5	21	7	95	73.4	49.87	4.20312	1.878963	340	4	0	4.97	SCT	4	2000	0	988.3333
2024	5	21	8	96.8	71.6	44.41	7.35546	3.288185	290	7	0	4.97	SCT	4	2000	0	988.3333
2024	5	21	9	96.8	71.6	44.41	6.30468	2.818444	250	6	0	4.97	SCT	4	2000	0	987.3333
2024	5	21	10	96.8	71.6	44.41	6.30468	2.818444	310	6	0	4.97	SCT	4	2000	0	987.3333
2024	5	21	11	96.8	71.6	44.41	6.30468	2.818444	300	6	0	4.97	SCT	4	2000	0	987.3333
2024	5	21	12	96.8	71.6	44.41	6.30468	2.818444	280	6	0	4.97	SCT	4	2000	0	987.3333
2024	5	21	13	96.8	69.8	41.77	4.20312	1.878963	320	4	0	4.97	SCT	4	2000	0	987.3333
2024	5	21	14	96.8	71.6	44.41	4.20312	1.878963	250	4	0	4.97	SCT	4	2000	0	987.3333
2024	5	21	15	96.8	71.6	44.41	4.20312	1.878963	300	4	0	4.97	SCT	4	2000	0	988.3333
2024	5	21	16	95	71.6	46.93	4.20312	1.878963	270	4	0	4.97	SCT	4	2000	3.84	993.3333
2024	5	21	17	87.8	75.2	66.35	2.10156	0.939481	40	2	0	3.11	SCT	4	2000	37.72	992.3333
2024	5	21	18	91.4	75.2	59.24	2.10156	0.939481	40	2	0	3.11	SCT	4	2000	641.41	992.3333
2024	5	21	19	91.4	75.2	59.24	4.20312	1.878963	340	4	0	3.11	SCT	4	2000	777.58	992.3333
2024	5	21	20	91.4	75.2	59.24	5.2539	2.348703	220	5	0	3.11	SCT	4	2000	854.51	992.3333
2024	5	21	21	93.2	73.4	52.73	3.15234	1.409222	240	3	0	3.11	SCT	4	2000	891.46	991.3333
2024	5	21	22	95	73.4	49.87	5.2539	2.348703	260	5	0	3.11	SCT	4	2000	885.01	991.3333
2024	5	21	23	95	71.6	46.93	4.20312	1.878963	200	4	0	2.49	SCT	4	2000	855.86	990.3333
2024	5	22	0	96.8	68	39.27	5.2539	2.348703	210	5	0	3.73	SCT	4	2000	808.99	989.3333
2024	5	22	1	98.6	68	37.17	6.30468	2.818444	100	6	0	3.73	SCT	4	2000	737.26	989.3333
2024	5	22	2	98.6	68	37.17	4.20312	1.878963	180	4	0	3.73	FEW	4	2000	619.79	988.3333
2024	5	22	3	102.2	66.2	31.34	5.2539	2.348703	50	5	0	3.73	SCT	4	2000	432.59	987.3333
2024	5	22	4	102.2	64.4	29.43	5.2539	2.348703	180	5	0	3.73	SCT	4	2000	225.6	986.3333
2024	5	22	5	102.2	64.4	29.43	3.15234	1.409222	210	3	0	3.73	SCT	4	2000	0	986.3333
2024	5	22	6	102.2	64.4	29.43	5.2539	2.348703	90	5	0	3.73	SCT	4	2000	0	986.3333
2024	5	22	7	102.2	62.6	27.63	4.20312	1.878963	170	4	0	3.73	SCT	4	2000	0	986.3333
2024	5	22	8	102.2	62.6	27.63	3.15234	1.409222	140	3	0	3.73	SCT	4	2000	0	986.3333
2024	5	22	9	104	64.4	27.89	4.20312	1.878963	160	4	0	3.73	FEW	4	2000	0	992.3333
2024	5	22	10	86	77	74.61	3.15234	1.409222	220	3	0	3.11	FEW	4	2000	0	993.3333

2024	5	22	11	89.6	77	66.55	4.20312	1.878963	170	4	0	3.11	FEW	4	2000	0	992.3333
2024	5	22	12	91.4	75.2	59.24	6.30468	2.818444	190	6	0	3.11	FEW	4	2000	0	992.3333
2024	5	22	13	95	73.4	49.87	4.20312	1.878963	220	4	0	3.11	FEW	4	2000	0	991.3333
2024	5	22	14	96.8	73.4	47.19	4.20312	1.878963	160	4	0	3.11	FEW	4	2000	0	991.3333
2024	5	22	15	96.8	71.6	44.41	6.30468	2.818444	170	6	0	3.11	FEW	4	2000	0	990.3333
2024	5	22	16	100.4	71.6	39.81	4.20312	1.878963	290	4	0	3.11	FEW	4	2000	0	989.3333
2024	5	22	17	100.4	71.6	39.81	5.2539	2.348703	170	5	0	3.11	FEW	4	2000	3.84	989.3333
2024	5	22	18	100.4	69.8	37.44	6.30468	2.818444	180	6	0	3.73	FEW	4	2000	37.72	988.3333
2024	5	22	19	102.2	68	33.35	4.20312	1.878963	140	4	0	3.73	FEW	4	2000	641.41	987.3333
2024	5	22	20	104	64.4	27.89	5.2539	2.348703	210	5	0	3.73	FEW	4	2000	777.58	987.3333
2024	5	22	21	102.2	66.2	31.34	6.30468	2.818444	180	6	0	3.73	FEW	4	2000	854.51	987.3333
2024	5	22	22	100.4	64.4	31.07	7.35546	3.288185	70	7	0	3.73	FEW	4	2000	891.46	987.3333
2024	5	22	23	98.6	53.6	22.29	4.20312	1.878963	100	4	0	3.73	FEW	4	2000	885.01	986.3333
2024	5	23	0	98.6	64.4	32.81	5.2539	2.348703	120	5	0	3.73	FEW	4	2000	855.86	987.3333
2024	5	23	1	100.4	64.4	31.07	6.30468	2.818444	120	6	0	3.73	SCT	4	2000	808.99	987.3333
2024	5	23	2	100.4	62.6	29.17	5.2539	2.348703	120	5	0	3.73	SCT	4	2000	737.26	988.3333
2024	5	23	3	100.4	64.4	31.07	5.2539	2.348703	170	5	0	3.73	SCT	4	2000	619.79	993.3333
2024	5	23	4	87.8	73.4	62.47	6.30468	2.818444	180	6	0	3.11	SCT	4	2000	432.59	994.3333
2024	5	23	5	89.6	75.2	62.68	6.30468	2.818444	210	6	0	3.11	SCT	4	2000	225.6	994.3333
2024	5	23	6	91.4	75.2	59.24	6.30468	2.818444	190	6	0	3.11	SCT	4	2000	0	993.3333
2024	5	23	7	91.4	75.2	59.24	5.2539	2.348703	190	5	0	3.11	SCT	4	2000	0	993.3333
2024	5	23	8	93.2	75.2	56.01	4.20312	1.878963	210	4	0	3.11	FEW	2	2000	0	993.3333
2024	5	23	9	95	73.4	49.87	4.20312	1.878963	190	4	0	3.11	FEW	2	2000	0	992.3333
2024	5	23	10	95	73.4	49.87	4.20312	1.878963	160	4	0	3.11	FEW	2	2000	0	991.3333
2024	5	23	11	96.8	71.6	44.41	4.20312	1.878963	140	4	0	3.11	SCT	4	2000	0	991.3333
2024	5	23	12	98.6	69.8	39.54	7.35546	3.288185	170	7	0	3.73	SCT	4	2000	0	990.3333
2024	5	23	13	100.4	69.8	37.44	6.30468	2.818444	180	6	0	3.73	SCT	4	2000	0	989.3333
2024	5	23	14	100.4	68	35.2	5.2539	2.348703	160	5	0	3.73	SCT	4	2000	0	989.3333
2024	5	23	15	100.4	66.2	33.08	4.20312	1.878963	220	4	0	3.73	SCT	4	2000	0	988.3333
2024	5	23	16	100.4	62.6	29.17	4.20312	1.878963	170	4	0	4.35	SCT	4	2000	0	988.3333
2024	5	23	17	102.2	50	17.51	5.2539	2.348703	160	5	0	4.35	SCT	4	2000	0	988.3333
2024	5	23	18	102.2	57.2	22.79	6.30468	2.818444	180	6	0	4.35	SCT	4	2000	3.84	989.3333

2024	5	23	19	100.4	60.8	27.37	4.20312	1.878963	240	4	0	4.35	SCT	4	2000	37.72	990.3333
2024	5	23	20	87.8	68	51.98	12.6094	5.636888	20	12	0	3.73	SCT	4	2000	641.41	995
2024	5	23	21	86	77	74.61	4.20312	1.878963	230	4	0	3.11	SCT	4	2000	777.58	995
2024	5	23	22	91.4	77	62.9	4.20312	1.878963	190	4	0	3.11	SCT	4	2000	854.51	994.3333
2024	5	23	23	93.2	75.2	56.01	3.15234	1.409222	160	3	0	3.11	SCT	4	2000	891.46	993.3333
2024	5	24	0	95	73.4	49.87	5.2539	2.348703	180	5	0	3.11	SCT	4	2000	885.01	993.3333
2024	5	24	1	96.8	73.4	47.19	8.40624	3.757926	160	8	0	3.11	SCT	4	2000	855.86	992.3333
2024	5	24	2	96.8	73.4	47.19	5.2539	2.348703	150	5	0	3.11	SCT	4	2000	808.99	991.3333
2024	5	24	3	100.4	71.6	39.81	4.20312	1.878963	200	4	0	3.11	SCT	4	2000	737.26	991.3333
2024	5	24	4	100.4	69.8	37.44	5.2539	2.348703	240	5	0	3.73	SCT	4	2000	619.79	990.3333
2024	5	24	5	100.4	69.8	37.44	4.20312	1.878963	180	4	0	3.73	SCT	4	2000	432.59	990.3333
2024	5	24	6	100.4	68	35.2	6.30468	2.818444	80	6	0	3.73	SCT	4	2000	225.6	989.3333
2024	5	24	7	100.4	73.4	42.3	10.5078	4.697407	80	10	0	3.73	SCT	4	2000	0	989.3333
2024	5	24	8	98.6	71.6	42.04	8.40624	3.757926	100	8	0	3.73	SCT	4	2000	0	988.3333
2024	5	24	9	98.6	71.6	42.04	8.40624	3.757926	100	8	0	3.73	SCT	4	2000	0	988.3333
2024	5	24	10	98.6	69.8	39.54	6.30468	2.818444	130	6	0	3.73	SCT	4	2000	0	989.3333
2024	5	24	11	96.8	68	39.27	6.30468	2.818444	140	6	0	3.73	SCT	4	2000	0	989.3333
2024	5	24	12	96.8	68	39.27	5.2539	2.348703	200	5	0	3.73	SCT	4	2000	0	990.3333
2024	5	24	13	91.4	69.8	49.36	5.2539	2.348703	280	5	0	3.73	SCT	4	2000	0	993.3333
2024	5	24	14	86	71.6	62.25	4.20312	1.878963	200	4	0	3.11	SCT	4	2000	0	993.3333
2024	5	24	15	89.6	71.6	55.53	4.20312	1.878963	250	4	0	3.11	SCT	4	2000	0	993.3333
2024	5	24	16	91.4	68	46.41	6.30468	2.818444	220	6	0	3.11	SCT	4	2000	0	992.3333
2024	5	24	17	93.2	68	43.88	5.2539	2.348703	180	5	0	3.11	SCT	4	2000	0	992.3333
2024	5	24	18	93.2	64.4	38.73	8.40624	3.757926	170	8	0	3.11	SCT	4	2000	0	992.3333
2024	5	24	19	95	68	41.5	5.2539	2.348703	220	5	0	3.11	SCT	4	2000	3.84	991.3333
2024	5	24	20	95	66.2	39	4.20312	1.878963	260	4	0	3.73	SCT	4	2000	37.72	991.3333
2024	5	24	21	96.8	66.2	36.9	4.20312	1.878963	200	4	0	3.73	SCT	4	2000	641.41	990.3333
2024	5	24	22	98.6	66.2	34.93	6.30468	2.818444	220	6	0	3.73	SCT	4	2000	777.58	988.3333
2024	5	24	23	100.4	66.2	33.08	4.20312	1.878963	140	4	0	3.73	SCT	4	2000	854.51	988.3333
2024	5	25	0	100.4	64.4	31.07	4.20312	1.878963	130	4	0	3.73	SCT	4	2000	891.46	987.3333
2024	5	25	1	102.2	64.4	29.43	5.2539	2.348703	150	5	0	3.73	SCT	4	2000	885.01	987.3333
2024	5	25	2	102.2	62.6	27.63	4.20312	1.878963	120	4	0	3.73	SCT	4	2000	855.86	987.3333

2024	5	25	3	102.2	62.6	27.63	4.20312	1.878963	150	4	0	3.73	SCT	4	2000	808.99	987.3333
2024	5	25	4	102.2	62.6	27.63	5.2539	2.348703	170	5	0	3.73	SCT	4	2000	737.26	994.3333
2024	5	25	5	86	69.8	58.55	4.20312	1.878963	230	4	0	3.73	SCT	4	2000	619.79	994.3333
2024	5	25	6	89.6	68	49.1	4.20312	1.878963	340	4	0	3.73	SCT	4	2000	432.59	994.3333
2024	5	25	7	91.4	69.8	49.36	3.15234	1.409222	300	3	0	3.73	SCT	4	2000	225.6	993.3333
2024	5	25	8	91.4	68	46.41	5.2539	2.348703	210	5	0	3.73	SCT	4	2000	0	993.3333
2024	5	25	9	93.2	69.8	46.67	4.20312	1.878963	230	4	0	3.73	SCT	4	2000	0	992.3333
2024	5	25	10	93.2	68	43.88	4.20312	1.878963	230	4	0	3.73	SCT	4	2000	0	992.3333
2024	5	25	11	95	69.8	44.14	4.20312	1.878963	240	4	0	3.73	SCT	4	2000	0	991.3333
2024	5	25	12	96.8	68	39.27	8.40624	3.757926	180	8	0	3.73	SCT	4	2000	0	990.3333
2024	5	25	13	98.6	68	37.17	7.35546	3.288185	170	7	0	4.35	SCT	4	2000	0	990.3333
2024	5	25	14	100.4	66.2	33.08	6.30468	2.818444	200	6	0	4.35	SCT	4	2000	0	989.3333
2024	5	25	15	100.4	66.2	33.08	5.2539	2.348703	180	5	0	4.35	SCT	4	2000	0	988.3333
2024	5	25	16	102.2	62.6	27.63	7.35546	3.288185	210	7	0	4.35	SCT	4	2000	0	988.3333
2024	5	25	17	102.2	64.4	29.43	8.40624	3.757926	190	8	0	4.35	SCT	4	2000	0	988.3333
2024	5	25	18	102.2	62.6	27.63	9.45702	4.227666	190	9	0	4.35	SCT	4	2000	0	988.3333
2024	5	25	19	102.2	62.6	27.63	8.40624	3.757926	200	8	0	4.35	SCT	4	2000	0	995
2024	5	25	20	80.6	71.6	74.11	3.15234	1.409222	220	3	0	3.73	SCT	4	2000	3.84	996
2024	5	25	21	82.4	71.6	69.9	3.15234	1.409222	80	3	0	3.73	SCT	4	2000	37.72	995
2024	5	25	22	87.8	66.2	48.84	3.15234	1.409222	60	3	0	4.35	SCT	4	2000	641.41	995
2024	5	25	23	89.6	68	49.1	3.15234	1.409222	240	3	0	4.35	SCT	4	2000	777.58	995
2024	5	26	0	89.6	69.8	52.23	3.15234	1.409222	290	3	0	4.35	SCT	4	2000	854.51	994.3333
2024	5	26	1	89.6	68	49.1	4.20312	1.878963	150	4	0	4.35	SCT	4	2000	891.46	993.3333
2024	5	26	2	91.4	68	46.41	4.20312	1.878963	180	4	0	4.35	SCT	4	2000	885.01	993.3333
2024	5	26	3	93.2	68	43.88	4.20312	1.878963	170	4	0	4.35	SCT	4	2000	855.86	993.3333
2024	5	26	4	95	68	41.5	5.2539	2.348703	200	5	0	4.35	SCT	4	2000	808.99	992.3333
2024	5	26	5	95	68	41.5	4.20312	1.878963	220	4	0	4.35	SCT	4	2000	737.26	992.3333
2024	5	26	6	95	64.4	36.63	6.30468	2.818444	200	6	0	4.35	SCT	4	2000	619.79	991.3333
2024	5	26	7	96.8	66.2	36.9	4.20312	1.878963	220	4	0	4.35	SCT	4	2000	432.59	991.3333
2024	5	26	8	96.8	66.2	36.9	4.20312	1.878963	260	4	0	4.35	SCT	4	2000	225.6	990.3333
2024	5	26	9	96.8	68	39.27	4.20312	1.878963	230	4	0	4.35	SCT	4	2000	0	990.3333
2024	5	26	10	96.8	66.2	36.9	4.20312	1.878963	210	4	0	4.35	SCT	4	2000	0	997

2024	5	26	11	78.8	71.6	78.62	8.40624	3.757926	10	8	0	3.11	SCT	4	2000	0	996
2024	5	26	12	82.4	71.6	69.9	5.2539	2.348703	330	5	0	3.73	SCT	4	2000	0	996
2024	5	26	13	84.2	69.8	62.03	5.2539	2.348703	320	5	0	3.73	SCT	4	2000	0	996
2024	5	26	14	87.8	68	51.98	4.20312	1.878963	350	4	0	4.35	SCT	4	2000	0	995
2024	5	26	15	87.8	68	51.98	4.20312	1.878963	350	4	0	4.35	SCT	4	2000	0	995
2024	5	26	16	87.8	71.6	58.78	4.20312	1.878963	340	4	0	4.35	SCT	4	2000	0	994.3333
2024	5	26	17	87.8	73.4	62.47	4.20312	1.878963	270	4	0	4.35	SCT	4	2000	0	994.3333
2024	5	26	18	87.8	71.6	58.78	4.20312	1.878963	280	4	0	4.35	SCT	4	2000	0	993.3333
2024	5	26	19	89.6	71.6	55.53	4.20312	1.878963	340	4	0	4.35	SCT	4	2000	0	992.3333
2024	5	26	20	91.4	68	46.41	3.15234	1.409222	30	3	0	4.35	SCT	4	2000	0	992.3333
2024	5	26	21	91.4	69.8	49.36	3.15234	1.409222	190	3	0	4.35	SCT	4	1800	3.84	991.3333
2024	5	26	22	95	68	41.5	3.15234	1.409222	310	3	0	4.35	SCT	4	1800	37.72	990.3333
2024	5	26	23	96.8	66.2	36.9	5.2539	2.348703	260	5	0	4.35	SCT	4	2000	641.41	990.3333
2024	5	27	0	96.8	66.2	36.9	4.20312	1.878963	300	4	0	4.97	SCT	4	2000	777.58	990.3333
2024	5	27	1	96.8	62.6	32.54	4.20312	1.878963	220	4	0	4.97	SCT	4	2000	854.51	990.3333
2024	5	27	2	96.8	62.6	32.54	4.20312	1.878963	290	4	0	4.97	SCT	4	2000	891.46	989.3333
2024	5	27	3	96.8	64.4	34.66	4.20312	1.878963	290	4	0	4.97	SCT	4	2000	885.01	994.3333
2024	5	27	4	86	75.2	70.27	3.15234	1.409222	110	3	0	3.11	SCT	4	2000	855.86	994.3333
2024	5	27	5	87.8	73.4	62.47	3.15234	1.409222	130	3	0	3.11	SCT	4	2000	808.99	994.3333
2024	5	27	6	91.4	71.6	52.48	3.15234	1.409222	170	3	0	3.11	SCT	4	2000	737.26	994.3333
2024	5	27	7	91.4	71.6	52.48	3.15234	1.409222	100	3	0	3.11	SCT	4	2000	619.79	993.3333
2024	5	27	8	91.4	71.6	52.48	5.2539	2.348703	100	5	0	3.11	SCT	4	2000	432.59	993.3333
2024	5	27	9	93.2	71.6	49.62	5.2539	2.348703	160	5	0	3.11	SCT	4	2000	225.6	992.3333
2024	5	27	10	93.2	71.6	49.62	6.30468	2.818444	70	6	0	3.11	SCT	4	2000	0	992.3333
2024	5	27	11	95	69.8	44.14	5.2539	2.348703	120	5	0	3.73	SCT	4	2000	0	991.3333
2024	5	27	12	95	68	41.5	5.2539	2.348703	80	5	0	3.73	SCT	4	2000	0	990.3333
2024	5	27	13	96.8	66.2	36.9	4.20312	1.878963	130	4	0	3.73	SCT	4	2000	0	990.3333
2024	5	27	14	93.2	69.8	46.67	10.5078	4.697407	80	10	0	3.73	SCT	4	2000	0	990.3333
2024	5	27	15	93.2	66.2	41.23	10.5078	4.697407	60	10	0	3.73	SCT	4	2000	0	989.3333
2024	5	27	16	96.8	66.2	36.9	6.30468	2.818444	80	6	0	3.73	SCT	4	2000	0	989.3333
2024	5	27	17	96.8	60.8	30.53	6.30468	2.818444	100	6	0	4.35	SCT	4	2000	0	989.3333
2024	5	27	18	96.8	62.6	32.54	5.2539	2.348703	120	5	0	4.35	SCT	4	2000	0	988.3333

2024	5	27	19	96.8	62.6	32.54	4.20312	1.878963	60	4	0	4.35	SCT	4	1800	0	989.3333
2024	5	27	20	95	62.6	34.39	3.15234	1.409222	70	3	0	4.35	SCT	4	1800	0	989.3333
2024	5	27	21	95	64.4	36.63	4.20312	1.878963	90	4	0	3.73	SCT	4	1800	0	990.3333
2024	5	27	22	93.2	66.2	41.23	4.20312	1.878963	100	4	0	3.73	SCT	4	1800	3.84	995
2024	5	27	23	80.6	77	88.83	4.20312	1.878963	170	4	0	3.11	SCT	4	1800	37.72	996
2024	5	28	0	84.2	77	79.04	5.2539	2.348703	210	5	0	3.11	SCT	4	1800	641.41	996
2024	5	28	1	86	77	74.61	4.20312	1.878963	230	4	0	3.11	SCT	4	1800	777.58	995
2024	5	28	2	86	75.2	70.27	6.30468	2.818444	180	6	0	3.11	SCT	4	2000	854.51	995
2024	5	28	3	87.8	75.2	66.35	5.2539	2.348703	240	5	0	3.11	SCT	4	2000	891.46	994.3333
2024	5	28	4	89.6	75.2	62.68	4.20312	1.878963	40	4	0	3.11	SCT	4	2000	885.01	994.3333
2024	5	28	5	89.6	73.4	59.01	4.20312	1.878963	120	4	0	3.11	SCT	4	2000	855.86	994.3333
2024	5	28	6	91.4	73.4	55.77	4.20312	1.878963	350	4	0	3.11	SCT	4	2000	808.99	993.3333
2024	5	28	7	91.4	71.6	52.48	5.2539	2.348703	150	5	0	3.73	SCT	4	2000	737.26	992.3333
2024	5	28	8	95	69.8	44.14	4.20312	1.878963	310	4	0	3.73	SCT	4	2000	619.79	992.3333
2024	5	28	9	95	69.8	44.14	4.20312	1.878963	340	4	0	3.73	SCT	4	2000	432.59	991.3333
2024	5	28	10	95	69.8	44.14	4.20312	1.878963	190	4	0	3.73	SCT	4	2000	225.6	989.3333
2024	5	28	11	98.6	68	37.17	6.30468	2.818444	310	6	0	4.35	SCT	4	2000	0	989.3333
2024	5	28	12	98.6	66.2	34.93	5.2539	2.348703	340	5	0	4.35	SCT	4	2000	0	989.3333
2024	5	28	13	96.8	69.8	41.77	8.40624	3.757926	110	8	0	4.35	SCT	4	2000	0	989.3333
2024	5	28	14	95	68	41.5	8.40624	3.757926	100	8	0	4.35	SCT	4	2000	0	989.3333
2024	5	28	15	95	68	41.5	6.30468	2.818444	120	6	0	4.35	SCT	4	2000	0	996
2024	5	28	16	86	75.2	70.27	2.10156	0.939481	40	2	0	3.11	SCT	4	2000	0	996
2024	5	28	17	87.8	75.2	66.35	4.20312	1.878963	120	4	0	3.73	SCT	4	2000	0	995
2024	5	28	18	89.6	71.6	55.53	6.30468	2.818444	190	6	0	3.73	SCT	4	1800	0	995
2024	5	28	19	91.4	71.6	52.48	3.15234	1.409222	190	3	0	3.73	SCT	4	2000	0	995
2024	5	28	20	93.2	71.6	49.62	3.15234	1.409222	170	3	0	3.73	SCT	4	2000	0	994.3333
2024	5	28	21	93.2	71.6	49.62	4.20312	1.878963	120	4	0	4.35	SCT	4	2000	0	994.3333
2024	5	28	22	93.2	69.8	46.67	3.15234	1.409222	130	3	0	4.35	SCT	4	2000	0	993.3333
2024	5	28	23	89.6	77	66.55	15.7617	7.04611	30	15	0	3.11	SCT	4	2000	3.84	993.3333
2024	5	29	0	80.6	78.8	94.27	16.8125	7.515851	30	16	0	2.49	SCT	4	2000	37.72	993.3333
2024	5	29	1	78.8	77	94.23	6.30468	2.818444	80	6	0	3.11	SCT	4	2000	641.41	993.3333
2024	5	29	2	80.6	78.8	94.27	6.30468	2.818444	80	6	0	3.11	SCT	4	2000	777.58	992.3333

2024	5	29	3	82.4	77	83.77	6.30468	2.818444	80	6	0	3.73	SCT	4	2000	854.51	992.3333
2024	5	29	4	80.6	78.8	94.27	3.15234	1.409222	80	3	0	4.35	SCT	4	2000	891.46	992.3333
2024	5	29	5	80.6	78.8	94.27	4.20312	1.878963	100	4	0	4.35	SCT	4	2000	885.01	992.3333
2024	5	29	6	80.6	78.8	94.27	3.15234	1.409222	120	3	0	3.73	SCT	4	2000	855.86	992.3333
2024	5	29	7	80.6	78.8	94.27	3.15234	1.409222	80	3	0	3.73	SCT	4	2000	808.99	996
2024	5	29	8	84.2	78.8	83.88	3.15234	1.409222	340	3	0	3.11	SCT	4	2000	737.26	996
2024	5	29	9	86	77	74.61	2.10156	0.939481	40	2	0	3.11	SCT	4	2000	619.79	996
2024	5	29	10	87.8	75.2	66.35	4.20312	1.878963	180	4	0	3.11	SCT	4	2000	432.59	996
2024	5	29	11	87.8	75.2	66.35	4.20312	1.878963	180	4	0	3.73	SCT	4	2000	225.6	996
2024	5	29	12	91.4	75.2	59.24	3.15234	1.409222	130	3	0	3.73	SCT	4	2000	0	995
2024	5	29	13	89.6	75.2	62.68	4.20312	1.878963	160	4	0	3.73	SCT	4	2000	0	995
2024	5	29	14	91.4	75.2	59.24	2.10156	0.939481	40	2	0	3.73	SCT	4	2000	0	994.3333
2024	5	29	15	91.4	73.4	55.77	2.10156	0.939481	40	2	0	3.73	SCT	4	2000	0	993.3333
2024	5	29	16	93.2	73.4	52.73	4.20312	1.878963	130	4	0	3.73	SCT	4	2000	0	992.3333
2024	5	29	17	91.4	68	46.41	11.5586	5.167148	80	11	0	3.73	SCT	4	2000	0	990.3333
2024	5	29	18	91.4	69.8	49.36	6.30468	2.818444	110	6	0	3.73	SCT	4	2000	0	990.3333
2024	5	29	19	93.2	71.6	49.62	5.2539	2.348703	110	5	0	4.35	SCT	4	2000	0	990.3333
2024	5	29	20	95	69.8	44.14	3.15234	1.409222	160	3	0	4.35	SCT	4	2000	0	990.3333
2024	5	29	21	95	68	41.5	3.15234	1.409222	170	3	0	4.35	SCT	4	2000	0	990.3333
2024	5	29	22	93.2	68	43.88	4.20312	1.878963	150	4	0	4.35	SCT	4	2000	0	995
2024	5	29	23	86	77	74.61	4.20312	1.878963	10	4	0	3.73	SCT	4	2000	0	995
2024	5	30	0	87.8	77	70.45	4.20312	1.878963	350	4	0	4.35	SCT	4	2000	3.84	995
2024	5	30	1	89.6	75.2	62.68	4.20312	1.878963	30	4	0	4.35	SCT	4	2000	37.72	995
2024	5	30	2	91.4	73.4	55.77	4.20312	1.878963	10	4	0	4.35	SCT	4	2000	641.41	994.3333
2024	5	30	3	91.4	73.4	55.77	5.2539	2.348703	310	5	0	4.35	SCT	4	2000	777.58	994.3333
2024	5	30	4	91.4	73.4	55.77	5.2539	2.348703	340	5	0	4.35	SCT	4	2000	854.51	994.3333
2024	5	30	5	89.6	73.4	59.01	5.2539	2.348703	60	5	0	3.11	SCT	4	2000	891.46	994.3333
2024	5	30	6	80.6	73.4	78.76	5.2539	2.348703	340	5	0	3.11	SCT	4	2000	885.01	993.3333
2024	5	30	7	82.4	78.8	88.9	4.20312	1.878963	240	4	0	3.73	SCT	4	2000	855.86	992.3333
2024	5	30	8	87.8	77	70.45	4.20312	1.878963	80	4	0	4.35	SCT	4	2000	808.99	991.3333
2024	5	30	9	91.4	73.4	55.77	3.15234	1.409222	130	3	0	4.35	SCT	4	2000	737.26	991.3333
2024	5	30	10	96.8	68	39.27	3.15234	1.409222	70	3	0	4.35	SCT	4	2000	619.79	990.3333

2024	5	30	11	95	71.6	46.93	10.5078	4.697407	110	10	0	4.35	SCT	4	2000	432.59	990.3333
2024	5	30	12	91.4	71.6	52.48	10.5078	4.697407	130	10	0	4.35	SCT	4	2000	225.6	990.3333
2024	5	30	13	89.6	73.4	59.01	8.40624	3.757926	120	8	0	4.35	SCT	4	2000	0	990.3333
2024	5	30	14	89.6	73.4	59.01	6.30468	2.818444	120	6	0	4.35	SCT	4	2000	0	990.3333
2024	5	30	15	89.6	73.4	59.01	6.30468	2.818444	140	6	0	4.35	SCT	4	2000	0	990.3333
2024	5	30	16	89.6	73.4	59.01	5.2539	2.348703	130	5	0	4.35	SCT	4	2000	0	990.3333
2024	5	30	17	87.8	73.4	62.47	4.20312	1.878963	160	4	0	4.35	SCT	4	2000	0	991.3333
2024	5	30	18	87.8	73.4	62.47	4.20312	1.878963	160	4	0	4.35	SCT	4	2000	0	992.3333
2024	5	30	19	87.8	75.2	66.35	6.30468	2.818444	160	6	0	4.35	SCT	4	1800	0	995
2024	5	30	20	84.2	77	79.04	3.15234	1.409222	130	3	0	3.11	SCT	4	1800	0	995
2024	5	30	21	86	77	74.61	3.15234	1.409222	160	3	0	3.11	SCT	4	1800	0	995
2024	5	30	22	87.8	77	70.45	4.20312	1.878963	280	4	0	3.11	SCT	4	1800	0	995
2024	5	30	23	87.8	75.2	66.35	3.15234	1.409222	120	3	0	3.11	FEW	2	1000	0	995
2024	5	31	0	89.6	71.6	55.53	4.20312	1.878963	80	4	0	3.11	FEW	2	1000	0	994.3333
2024	5	31	1	89.6	71.6	55.53	4.20312	1.878963	250	4	0	3.11	FEW	2	1000	3.84	994.3333
2024	5	31	2	89.6	71.6	55.53	4.20312	1.878963	100	4	0	3.11	FEW	2	1000	37.72	993.3333
2024	5	31	3	91.4	71.6	52.48	3.15234	1.409222	40	3	0	3.73	FEW	2	1000	641.41	992.3333
2024	5	31	4	93.2	69.8	46.67	3.15234	1.409222	170	3	0	3.73	SCT	4	2000	777.58	992.3333
2024	5	31	5	93.2	71.6	49.62	4.20312	1.878963	120	4	0	3.73	SCT	4	2000	854.51	991.3333
2024	5	31	6	93.2	71.6	49.62	10.5078	4.697407	70	10	0	3.73	SCT	4	2000	891.46	991.3333
2024	5	31	7	93.2	68	43.88	8.40624	3.757926	100	8	0	3.73	SCT	4	2000	885.01	990.3333
2024	5	31	8	89.6	71.6	55.53	12.6094	5.636888	110	12	0	3.73	FEW	2	1500	855.86	991.3333
2024	5	31	9	87.8	71.6	58.78	5.2539	2.348703	250	5	0	3.73	FEW	2	1500	808.99	991.3333
2024	5	31	10	84.2	73.4	70.08	8.40624	3.757926	160	8	0	3.73	FEW	2	1500	737.26	995
2024	5	31	11	82.4	75.2	78.9	4.20312	1.878963	340	4	0	3.11	FEW	2	1500	619.79	995
2024	5	31	12	84.2	75.2	74.44	4.20312	1.878963	340	4	0	3.11	SCT	4	2000	432.59	994.3333
2024	5	31	13	86	75.2	70.27	4.20312	1.878963	20	4	0	3.11	SCT	4	2000	225.6	994.3333
2024	5	31	14	87.8	73.4	62.47	3.15234	1.409222	350	3	0	3.11	SCT	4	2000	0	994.3333
2024	5	31	15	87.8	73.4	62.47	5.2539	2.348703	10	5	0	3.11	SCT	4	2000	0	994.3333
2024	5	31	16	91.4	73.4	55.77	8.40624	3.757926	20	8	0	3.11	SCT	4	2000	0	994.3333
2024	5	31	17	91.4	71.6	52.48	7.35546	3.288185	340	7	0	3.11	FEW	2	1500	0	993.3333
2024	5	31	18	93.2	71.6	49.62	6.30468	2.818444	340	6	0	3.11	FEW	2	1500	0	993.3333

2024	5	31	19	93.2	68	43.88	8.40624	3.757926	20	8	0	3.73	FEW	2	1500	0	992.3333
2024	5	31	20	95	66.2	39	5.2539	2.348703	10	5	0	3.73	FEW	2	1500	0	991.3333
2024	5	31	21	95	64.4	36.63	7.35546	3.288185	10	7	0	3.73	FEW	2	1500	0	991.3333
2024	5	31	22	95	62.6	34.39	10.5078	4.697407	340	10	0	3.73	FEW	2	1500	0	990.3333
2024	5	31	23	98.6	57.2	25.41	5.2539	2.348703	50	5	0	3.73	SCT	4	2000	0	990.3333

भारतीय गुणवत्ता परिषद्
QUALITY COUNCIL OF INDIA
Creating an Ecosystem for Quality

NABET

National Accreditation Board for Education and Training

Certificate of Accreditation

EHS360 Labs Private Limited, Chennai

Old No. 8/2, New No. 10/2, 50th Street, 7th Avenue, Ashok Nagar, Chennai, Tamil Nadu-600083

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 including opencast/underground mining	1	1 (a) (i)	A
2.	Mineral beneficiation	7	2 (b)	B
3.	Metallurgical industries (ferrous & non-ferrous)	8	3 (a)	B
4.	Synthetic organic chemicals industry	21	5 (f)	B
5.	Building and construction projects	38	8 (a)	B
6.	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in IAAC minutes dated September 2, 2022, and Supplementary Assessment minutes dated December 15, 2023 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/22/2564 dated October 21, 2022. The accreditation needs to be renewed before the expiry date by EHS360 Labs Private Limited, Chennai following due process of assessment.

Issue Date
January 24, 2024

Valid up to
June 24, 2025

Mr. Ajay Kumar Jha
Sr. Director, NABET

Certificate No.
NABET/EIA/22-25/IA 0098_Rev.01

Prof (Dr) Varinder S Kanwar
CEO-NABET

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