



FEASIBILITY REPORT



CONTENT

CHAPTER NO	PARTICULARS	PAGE NO
FEASIBILITY REPORT		
I	EXECUTIVE SUMMARY	4
II	INTRODUCTION OF THE PROJECT / BACKGROUND INFORMATION	11
III	PROJECT DESCRIPTION	16
IV	SITE ANALYSIS	35
V	PLANNING BRIEF	39
VI	PROPOSED INFRASTRUCTURE	41
VII	REHABILITATION & RESETTLEMENT (R&R) PLAN	43
VIII	PROJECT SCHEDULE & COST ESTIMATES	44
IX	ANALYSIS OF PROPOSAL (FINAL RECOMMENDATIONS)	45



LIST OF FIGURES

FIGURE NO	PARTICULARS	PAGE NO
1	LOCATION MAP	17
2	GEOLOGICAL PLAN	22
3	GEOLOGICAL CROSS SECTION	23
4	SURFACE LAYOUT PLAN	27
5	END OF V YEAR PLAN	28
6	CONCEPTUAL PLAN	29
7	INDEX PLAN	36

LIST OF ANNEXURES

ANNEXURE NO	PARTICULARS	PAGE NO
1	DETAILS OF SURVEY NUMBERS COVERED UNDER MINING LEASE AREA	A - 1
2	MINE LEASE DEED	A - 3
3	APPLICATION FOR LEASE RENEWAL	A - 8
4	RECENT MINING SCHEME APPROVAL LETTER FROM IBM	A - 10
5	TOR FOR PROJECT AREA OF 319.01 HA HA (COMPRISING 236.85 HA OF ML AREA AND 82.16 HA EXTERNAL DUMP AREA OUTSIDE THE LEASE	A - 12
6	EXTENSION OF VALIDITY OF TOR ISSUED IN VIDE LETTER NO. J.11015 /204/2010 – IA.II(M)DATED 19 TH AUGUST 2010	A - 17

CHAPTER – I

EXECUTIVE SUMMARY

1.0 INTRODUCTION OF THE PROJECT / BACKGROUND INFORMATION

1.1 BACKGROUND INFORMATION OF PROJECT:

M/s. Tamil Nadu Minerals Limited (TAMIN) (A Government of Tamil Nadu Undertaking) has been established to carry out systematic development and exploitation of different minerals all over Tamil Nadu. TAMIN is operating a Graphite mine of 60000 TPA capacity in the mining lease area of 237.39.50 Ha granted vide G.O.Ms. No: 1328, Industries Department dated: 24.12.1986 in different survey numbers **(Refer Annexure – 1)** in Pudupatti, Senthidayananathapuram and Kumarapatti villages, Sivaganga district, Tamil Nadu. The lease was valid up to 15.05.2007. The total mine lease area of the lease based on the revised land record is 236.85 ha as against 237.39.50 mentioned in the G O no 1328 is enclosed. **(Refer Annexure – 2).**

TAMIN has been producing graphite ore in this lease for nearly three decades.

Application for lease renewal has already been submitted to Government vide letter No 25203 dt 24-4-2006 **(Refer Annexure – 3)**. The mine is now working under deemed extension basis.

Mining plan for Graphite exploitation from the ML area was approved by the Regional controller of Mines, Indian Bureau of Mines, Chennai under reference TN/PMT/MP/GM – 076 MDS dated 11.3.94. Subsequently the first mining scheme report prepared for the period 1999-2004 was approved by the Regional controller of Mines, Bangalore as per their letter no TN/SG/GR/MS – 75/SZ dated 20-7-2000. Subsequent mining scheme II was approved for the year 2004-09 by the Controller of Mines, Bangalore as per their letter No. TN/59/GR/MS-SZ dt 24.12.04. Mining plan towards renewal of lease period was approved vide letter TN/SGM/MP/GR-1791-MDS dated 20.07.2012. Subsequently Scheme of Mining for the period 2013-14 to 2018-19, was duly approved by Indian Bureau of Mines vide letter TN/SGN/GR/MS-1123-MDS dated 03.09.2014. **(Refer Annexure – 4).**

Graphite is mined by semi-mechanized open cast mining methodology. Mined out ore after blending is dispatched through Tippers to the graphite beneficiation plant about 0.5 kms away for production of Graphite concentrates which have good commercial value especially in the manufacture of crucibles. Refractory bricks, batteries etc.



Mining operations are in progress for the past 3 decades by adopting proper technology & abiding to all the statutory requirements. Besides, adequate attention was given for environmental management including regular monitoring of various environmental components & submitting periodical reports to the concerned authorities. Similar mining operations, methodology and environmental management procedures will be continued during the M.L extension period also.

The lessee has applied for environmental clearance from MOEF & CC, **New Delhi for a total project area of 319.01 Ha (Comprising 236.85 Ha of ML area and 82.16 Ha external dump area outside the lease)**. TOR was issued vide letter No. J.11015 /204/2010 – IA.II (M) dated 19th August 2010 (**Refer Annexure - 5**) the validity of which was subsequently extended vide MOEF letter No. J-11015 /204/2010 – IA.II(M) dated 26th March 2013 (**Refer Annexure - 6**). Draft EIA/EMP report was subjected to public hearing on 27.06.2013 at DDC Hall, Collector's Office, Sivagangai district through District Collector of Sivaganga. Final EIA was prepared and submitted to MOEF vide letter No11595/ML1/2006 dated 14.08.2013.

In the meantime, as per the latest amendment of Indian Bureau of Mines, dumping has to be carried out within the lease area only. Hence the project area got reduced from 319.1 Ha to 236.85 Ha i.e ML area.

The lessee has also decided to increase the production to 1.05 LTPA from the earlier applied quantity of 0.6 LTPA. Hence, the lessee applied for fresh environmental clearance for an area of 236.85 Ha for a production of 1.05LTPA. ToR was issued on 28.05.2015. The draft report was subjected to public hearing on 29.07.2016 and the final EIA/EMP report was submitted in the MoEF & CC portal on 03.12.2016.

Being a violation case, now as per MoEF&CC notification dated 14.03.2017, Form – I, specific TOR and feasibility report is submitted to MoEF&CC Delhi, **for issue of specific TOR for this project to enable us to prepare an independent chapter**, include it in the final EIA/EMP report already prepared and submitted to MoEF&CC towards obtaining Environmental Clearance.

This feasibility report is prepared based on the Scheme of Mining prepared for the period 2014-15 to 2018-19, which was duly approved by Indian Bureau of Mines vide letter TN/SGN/GR/MS-1123-MDS dated 03.09.2014. Refer (**Annexure No - 4**)

1.2 SITE DESCRIPTION:

The description of the site is given below:

Sr. No.	Particulars	Details
1	Location	
a	Village	Pudupatti, Senthidayanathapuram & Kumarapatti villages
b	Tehsil	Sivaganga
c	District	Sivaganga
d	State	Tamil Nadu
e	Latitude	9° 53'11.76" N to 9° 54'0.72" N
f	Longitude	78°23'40.20" E to 78° 27'0.36" E
2	Elevation	87 m to 108 m AMSL
3	Climatic conditions	Annual Maximum Temperature: 40°C Annual Minimum Temperature : 20°C Annual Average Rainfall: 700 mm
4	Nearest highway	SH-34 passing East of Mine Lease area
5	Nearest railhead / Railway station	Sivaganga R.S, about 8 km, SE
6	Nearest airport	Madurai, 50 km, West
7	Defense installations	Nil within 10 km radius
8	Archaeological important places	Nil within 10 km radius
9	National Parks, Wildlife sanctuaries	Nil within 10 km radius
10	Reserved/Protected forests	Melakadu RF - 3.0 km (SE) Isanikadu RF - 1.5 km(SE) Vellimalai RF - 5.5km(N)
11	Industries in 10km radius	Graphite beneficiation plant of TAMIN
12	Nearest major city	Madurai, 50 km, West
13	Nearest major settlement	Sivaganga - 7 km, NW
14	Socio-economic factors	No Resettlement & Rehabilitation involved
15	Rivers in 10 km radius	Uppar, 1.5 km, West. Few ponds spread over the ML area
16	Seismic zone	II

2.0 PROJECT DESCRIPTION :

Salient features of project are as under:

- | | | |
|-----------------------------|---|----------------------------------|
| 1) Reserves/Resources | - | 4.04 Mil.T |
| 2) Proved reserves upto 30m | - | 3.407 Mil.T |
| 3) Total Waste quantity | - | 11.32 Mil.Cum |
| 4) Method of mining | - | Semi- mechanized opencast system |
| 5) Graphite production | - | 1.05 LTPA or 350 TPD |
| 6) Waste generation | - | 866 to 2140 tonnes/day |



- | | | |
|--------------------------------|---|---|
| 7) Machinery details | - | a) 3 numbers of Hydraulic Excavator (1m ³ cap) |
| | - | b) 10 Tippers of 6 m ³ capacity |
| | - | c) 3 Compressors of 17m ³ /min cap. |
| | - | d) 2 Wagon drill of 110 mm dia |
| | - | e) 2 Jack hammer 32mm dia |
| 8) Bench height & slope | - | 1.5m (Top O.B.bench), 5m (For ore) |
| 9) End use | - | Will be beneficiated in TAMIN's
beneficiation plant located about 500m
away from the mine and ore after
beneficiation are used in the manufacture of
refractory bricks, expanded graphite,
crucibles and carbon brushes. |
| 10) Mode of transport | - | By tippers to Graphite beneficiation plant
from mine. |
| 11) Life of the mine | - | Considering the present explored mineable
reserves, the life of mine will be 32.5
years. Further if the project resource is
converted in to proved category, the life of
the mine may increase accordingly. |
| 12) Water requirement & source | - | 40 m ³ / day met from own bore wells &
mine sump water |
| 13) Manpower | - | Direct 70 Persons in mines, 98 persons in
plant & indirect more than 200 persons |
| 14) Power Requirement | - | 250 KVA for integrated mine and
beneficiation plant will be met from the State
grid and DG Sets. |
| 15) Site services | - | All required amenities / facilities like rest
room, shelters, canteen, first-aid centre,
magazine facilities, etc. are already well
established in the area. |

2.1 QUANTITY OF WASTES TO BE GENERATED (LIQUID & SOLID)

The waste encountered is the overburden soil / inter burden and side burden. The top soil covering is being dozed and kept at a specific location of the lease area for growing vegetation, afforestation etc.

The waste to be generated during entire mining is 11.32 Mil.Cum out of which 0.781Mil.Cu.m will be generated during the ensuring 5 year plan period.

The waste generated during the Mining Scheme period will be dumped on the Northern side of Pit-II extension. The maximum height of the dump in the present scheme period is around 20m with two benches each of 10m. The maximum height of the dump in the ultimate stage is expected to be 40m. The waste generated during the mining will be accommodated in the waste dump shown in the conceptual plan.

This solid waste will be stacked in mine waste dumps and suitable stabilization by afforestation. As far as liquid waste is concerned, no liquid waste will be generated.

2.2 LAND USE PATTERN:

Type of Lease Area : Non-Forest Land: 236-85.0 Ha
(Government barren & Patta lands)

The present and during mining pattern are given below:

S.No	Description	Present Area (in Hectares)	Land use at the end of SOM period (in Hect)	Conceptual period (in Hect)
1	Mining (Quarry)	32-60.0	33-57.0	67.88.0
2	Overburden/Side burden Dump	1-94.0	7-94.0	41.72
3	Storage for Topsoil	0-65.0	1-59.0	15.18
4	Infrastructure	0-72.0	0-72.0	1.50
5	Mineral stockyard	12-25.0	12.25.0	15.25
6	Mine Roads	5-20.5	5-20.5	7.20.5
7	Area Under plantation	5-46.0	5-98.5	10.46.0
8	Unutilized area	178-02.5	169-59.0	77.655
TOTAL		236-85.0	236.85.0	236.85.0

Mining operations so far have been restricted to a depth of 30 m from ground level by exploiting the proved reserves and probable reserves. Future mining operations till the end of

the mining lease period will also be confined to 30 m depth only. But as drilling operations have indicated the persistence of graphite ore beyond 30 m depth, extending down to 100 m it is proposed not to close the mine & backfill at the expiry of present lease period. Hence the life of the mine may extend further and as such, mine closure is not planned now.

3.0 REHABILITATION & RESETTLEMENT (R&R) PLAN

The proposed expansion will be in the existing mine lease area. The entire mine lease area is in TAMIN's possession. There are no home owner or land owners and hence the question of rehabilitation and resettlement does not arise.

4.0 CAPITAL COST & PROJECT VIABILITY:

This being an existing mine in operation for the last 3 decades and capital cost is Rs.200Lakhs. The existing mining equipment and facilities will itself be utilized for expansion quantity.

The estimated production cost per MT of graphite is expected to be Rs.600/ per tonne. Since the entire ore will be utilized in the captive beneficiation plant nearby and there is good demand for processed graphite.

This project is Techno economically viable due to the following reasons:

Exploration is carried out and the reserves are mostly in the proved category

There is a good demand for the finished graphite because of many consuming industries.

The graphite mine is located at 3 km, W of Pudupatti village on Sivaganga - Melur Road (SH-34) and 7 km, NW of Sivaganga Town. The nearest Railway station is Sivaganga on Trichy - Rameswaram Melur gauge section and is 8 km from the mine. The site is quite accessible & has good communication & transport facilities.

The selling price is more than the production cost and hence it is economically viable.

5.0 CONCLUSION:

The existing mining operations in the area have already brought about positive impact locally by way of employment generation, increase in income generation, creation of infrastructural facility, marked improvement in the life style and living standards of population of the surrounding area.

There will be continued substantial improvement in case of local population in living standards, receipt of per capita income, cultural patterns, living styles, educational standards, etc by the continuation of the project.



There will be continual improvements of the local amenities like roads, communication, electricity, water supply, educational & recreational facilities, hospitals/ dispensaries, libraries, availability of variety of goods & services and other basic amenities needed for the local society.

As already mentioned earlier, the project will improve the social and physical infrastructural patterns of this interior area in its own way resulting in overall improvement of HDI (Human Development Index). Besides, the Central and State Government will also derive good financial benefits by way of receipt of taxes, duties and cess.

In view of above aspects of the project, the project can be said to be beneficial to the local community, the local region, the State and to the entire country on the whole.

Besides, this project is the only major industrial unit in the Sivaganga region, which is devoid of any other industrial ventures. Hence, from the points of view of local community employment and development of this rural backward area, continuation of the project assumes great importance.

* * * * *

CHAPTER – II

INTRODUCTION OF THE PROJECT / BACKGROUND INFORMATION

2.0 BACKGROUND INFORMATION OF PROJECT:

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Mining operations are in progress for the past 3 decades by adopting proper technology & abiding to all the statutory requirements. Besides, adequate attention was given for environmental management including regular monitoring of various environmental components & submitting periodical reports to the concerned authorities. Similar mining operations, methodology and environmental management procedures will be continued during the M.L extension period also.

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This feasibility report is prepared based on the Scheme of Mining prepared for the period 2014-15 to 2018-19, which was duly approved by Indian Bureau of Mines vide letter TN/SGN/GR/MS-1123-MDS dated 03.09.2014. Refer (**Annexure No - 4**).

2.1 IDENTIFICATION OF PROJECT AND PROJECT PROPONENT:

M/s. Tamil Nadu Minerals (TAMIN) Limited is a public sector undertaking fully owned by Government of Tamil Nadu, engaged in systematic exploration and exploitation of different



minerals and their development all over Tamil Nadu. They have gained mining expertise in exploiting granite, graphite, vermiculite, silica sand, and limestone deposits in Tamil Nadu for more than two decades. In fact, in granite mining and marketing, TAMIN, is one of the pioneers in this field, with vast exports effected in this respect in early periods.

Sivaganga graphite mine is a working mine for the last 3 decades with good approachability and availability of various facilities. There are no social problems envisaged due to absence of agricultural land or rehabilitation as in the case of few other projects.

Graphite is one of the most important industrial minerals with wide application in Metallurgical, Chemical and Engineering Industries. Mining of such strategic minerals is necessary for ensuring industrial progress of the country and to conserve foreign exchange which otherwise, will have to be spent in importing of such minerals.

Considering all these aspects, it is decided to obtain environmental clearance for mining 1.05 LTPA of graphite.

PROJECT PROPONENT:

Name and Address of the applicant:

M.Vallalar, I.A.S.,
Managing Director,
M/s. Tamil Nadu Minerals Limited,
(Government of Tamil Nadu undertaking)
31 Kamarajar Salai, Chepauk,
Chennai – 600005, Tamil Nadu
E mail: tamin@tamingranites.com
Telephone : 044 - 28524563, 044 - 28525113
Fax No. : 044-28524960, Mobile : 9488855535

The lessee is having experience in mining and marketing of graphite ore for a period of more than 3 decades.

As such, it can be seen that the project proponent is having versatile experience and expertise in graphite mining.

2.2 BRIEF DESCRIPTION OF NATURE OF PROJECT:

Mining is carried out by semi-mechanized open cast mining methodology. Mining operations are on a small scale with Graphite ore production of about 200 Tonnes per day

which after blending to the required grade is dispatched to the beneficiation plant of TAMIN located within 0.5 km from mines.

The salient features of the Graphite Mine are given **Table No - 1.2.**

Table No - 1-2

SALIENT FEATURES OF GRAPHITE MINE

S. No	Particulars	Details
1	Name of the Project	Sivaganga Graphite Mine of M/S.Tamil Nadu Mineral Ltd
2	Project Area	ML area: 236.85 ha
3	Proved Reserves	3.407 Mil.T Tones of Graphite
4	Method o Mining	Semi-Mechanized
5	Graphite Production	350 Tonnes/day
6	Waste Generation	866 to 2140 tonnes/day
7	Mine in Operation	For the past 3 decades
8	Targeted Production	1,04,791 tonnes/annum or 1.05 LTPA

2.3 NEED FOR THE PROJECT & ITS IMPORTANCE TO THE COUNTRY AND OR REGION:

The graphite mine project is linked to the Graphite Beneficiation Plant of the project proponent for uninterrupted supply of about 200 tonnes of graphite ore daily for production of 96% fixed carbon final graphite flakes for supply to various industrial users for manufacture of crucibles, electrodes, pencils, refractory bricks, paints, etc,. Hence, the project continuation is essential to provide graphite supplies to various strategic industrial users all over the country. It will also enable to exploit the natural reserves of graphite in this area by TAMIN for enabling utmost and efficient use of the mineral for overall economic growth of the region and the country.

Besides, the graphite mine project provides continuous employment prospects to about 70 persons on direct basis and the graphite beneficiation plant to about 98 persons directly.

About 200 persons indirectly, derive employment opportunities from the above TAMIN activities in allied sectors of trading, logistics, etc.

This project is situated in an interior undeveloped rural area in Sivaganga Taluk, where there are no other industrial units worth naming. Hence the project will continue to provide



financial and social benefits to the local rural folks and will assure enhanced living standards, better infrastructural growth and increased income levels for the local community.

In addition the Central and State Governments will also gain financially through receipts of income tax, sales tax, royalties, cesses, etc. A part of above revenues will also accrue to the local panchayats, etc.

In view of above aspects, the project assumes great importance both from regional and national perspectives.

2.4 DOMESTIC/ EXPORT MARKETS

The saleable graphite mine after beneficiation to various consuming industries, like Mag - carbon refractory bricks for lining furnaces. Graphite crucibles for melting non-ferrous metals, Carbon brushes, Paints, Lubricants, Graphite brake lining and clutches for automobiles Pencils are produced from TAMIN Flaky graphite.

2.5 EMPLOYMENT GENERATION

Presently 70 persons are engaged in mining operations which includes Managers & supervisors, Operators, mechanics and workers.

* * * * *

CHAPTER – III

PROJECT DESCRIPTION

3.1. TYPE OF PROJECT:

The graphite deposits of Sivaganga graphite mine is being mined by TAMIN by semi-mechanized opencast method, after removal of 1 to 2 m. of lateritic soil / OB, side burden, interburden and transporting same to separate dump yards located in the southern side of mine. The deposits occur as bands of varying thickness between 0.3 m to 16 m. and dipping almost vertical to 80° in lease hold area. The method of working of graphite ore is planned along strike direction to avoid contamination of OB/interburden as well as to extract pure graphite ore from the graphite bands. The elaborate mining scheme in this respect is furnished in subsequent paragraphs.

3.2 LOCATION:

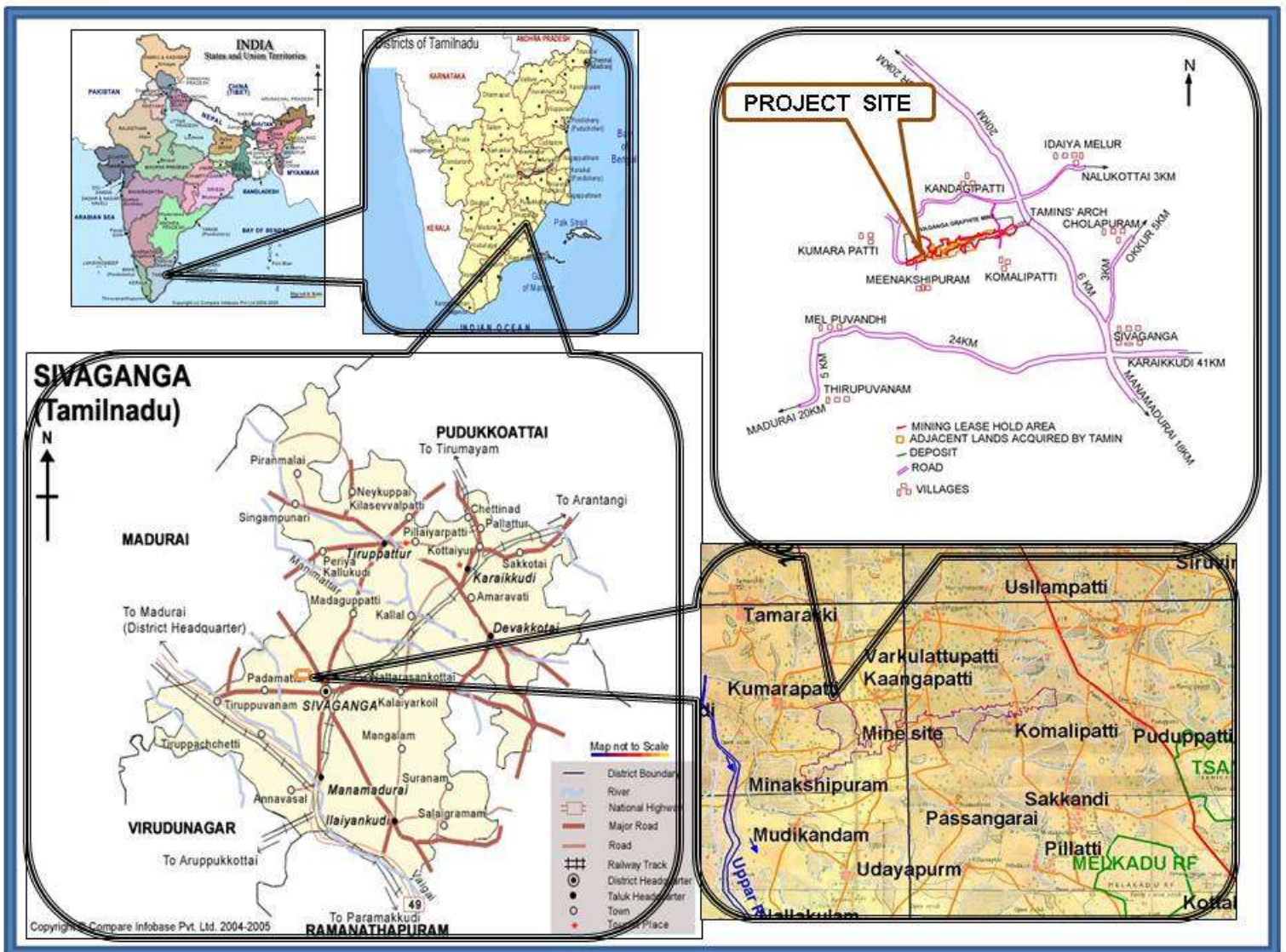
Mine lease area falls in the survey of India Toposheet no 58 K/5 and lies between East longitude 78°23'40.20" to 78° 27'0.36" and North latitude, 9° 53'11.76" to 9° 54'0.72" and covers parts of villages of Kumarapatti, Sendiudayanathapuram and Pudupatti of Sivaganga Taluk, Sivaganga District, Tamil Nadu.

The graphite mine is located at 3 kms, W of Pudupatti village on Sivaganga Melur Road (SH-34) and 7 km, NW of Sivaganga Town. The nearest Railway station is Sivaganga on Trichy-Rameswaram Melur gauge section and is 8 km from the mine. The site is quite accessible & has good communication & transport facilities.

The location Map attached as **Figure no 1**.

Figure no-1

LOCATION PLAN



3.3 DETAILS OF ALTERNATE SITES CONSIDERED & THE BASIS OF SELECTING THE PROPOSED SITE:

As far as mine is concerned, since this is an existing mining lease area for which lease already granted based on the availability of mineral, question of alternate site does not arise.

3.4 SIZE OR MAGNITUDE OF OPERATION:

The current proposal is for mining graphite of 1.05 lakh Tonnes (peak) within the granted mining lease area of 236.85Ha.

3.5 PROJECT DESCRIPTION:

3.5.1.1 Regional Geology

The area is generally covered by lateritic soil and alluvium. Outcrops of graphite are scarce. The hard rock units comprise of crystalline hard gneissic rocks belonging to Archean age. The strike of the formation varies between East-West and E.N.E. - W.S.W. trends. The dip is southerly ranging between 75° and 85° with an average of 80°. Vertical dips have also been observed at a number of places. The graphitic horizon however, displays generally a steep dip.

The rock types met with in Sivaganga taluk including the mine area form a part of the Archaean Complex comprising completely of crystalline rocks with coarse texture and evidences of deep seated metamorphism. The stratigraphic sequence is as follows:

1. Quartzites and Quartz-Graphite schist;
2. Calc-gneiss, calc granulites and crystalline lime stone;
3. Amphibolites;
4. Garnetiferous -- biotite gneiss, quartz-feldspathic gneiss;
5. Granite gneiss; and
6. Younger intrusives - pegmatites and quartz veins.

3.5.1.2 Local Geology

Lateritic soil and alluvium forms a thin cover allowing only scarce Outcrops of graphite band which are observed in the stream cutting and inflow channels of tanks.

Graphite bands have WSW trends with a southerly dip varying between 0° and 75°, with a few exceptions where dip is almost vertical.

The rock units comprise of the regionally metamorphosed siliceous and calcareous sediments later affected by younger intrusives viz. granites, pegmatites, quartz veins resulting in metamorphism, evidences of which are noticeable at several places.

The various lithological units found in and around the mine area are briefly described below:

Quartzites:

These rocks, by virtue of their conspicuous occurrence as knolls occupying slightly raised grounds serve as marker horizons. The rocks are massive and at many places display the sheared and schistose nature filled with ferruginous material.

Graphite is occasionally noticed in the schistose planes and brecciated quartzites with a little concentrations from place to place

Quartz; - Graphite Schist.

This unit occurs in association with granite gneisses and the massive quartzites described above. It is medium to fine grained in texture. Association of graphite has imparted black appearance where massive and banded appearance to the rock where alternate layers of quartz and graphite rich bands exist.

Crystalline Limestone, Calc-Gneiss:

The bands of crystalline limestone, calciphyres and calc-granulites are commonly found mixed with granitic gneisses in the western part of the area.

Biotite; - Gneiss, Quartzo-Feldpathic Gneiss:

These rocks do not show any regular pattern of occurrence. Wherever found, these are invariably associated with coarse grained pink granite. These are medium to coarse grained with varying proportion of feldspars and ferro-magnetic constituents.

Younger Intrusives:

The pink granites with ferro-magnesium minerals are younger to the rocks described earlier. The relationship between the gneisses and the younger granites is found to be one of intruded and intrusive. Enclaves of the former within the outcrops of the latter are quite frequent. The granites, specially the coarser varieties are seen to be crushed locally. Thus the cataclastic metamorphism is clearly proved to be much younger to granites.

3.5.1.3 Host Rock and Mode of Occurrence of Graphite

Quartz-Graphite schist is the principal host rock for graphite, though appreciable association with sheared and mylonitised quartzites has been noticed. Graphite occurrence in the form of parallel bands though traced over a strike length of 16km, TAMIN's lease area boundary length is limited to 5.5 km only, Individual bed is not continuous for the entire length and each may be traced for 100 M to 1600 M, length.

3.5.1.4 Control of Mineralization and Origin

Graphite bearing horizons are confined to a prominent shear zone striking N 80° E- S 80° W (Over a distance of about 16 km) with an average width of 60 m and a maximum of 150 m. The regional metamorphism of the carbonaceous sediments with siliceous admixture is considered to be one of the causes for the formation of graphite in the area. In addition, contact metamorphism of the earlier calcareous sediments may have also yielded graphite.

Geological plan and cross section are given as **Figure No 2 & 3**.

3.5.2 RESERVES:

Based on the scheme of mining, total mineable reserves were estimated as 3.407 Million tons based on the exploration so far carried out.

In addition to the 45 Bore holes already drilled within the working pits 15 bore holes covering the areas where the influence of previous boreholes does not fall have been drilled during the year 2013-2014 upto a depth of 30m. By this additional exploration studies mineral existence with the same grade has been confirmed in these uncovered area upto the depth of 30m. The mineral reserve in these area which have been included under 121 probable reserved has been converted into proved reserves 111 category.

Category wise Mineral Reserves estimated in the Mining Plan (Updated) (in Tonnes)		Additional Reserves established during the Mining Plan Period (Updated) (in Tonnes)		Updated Reserves (in tones)	
Proved (111)	Probable (121)	Proved (111)	Probable (121)	Proved (111)	Probable (121)
*18,28,951	14,88,358	15,53,296	(-) 14,88,358	34,07,372	Nil

*(14,30,122+12,68,731 – (Depletion of Reserves upto 2013-14) + 26,98,853 – 8,69,902 + 18,28,951)

The updated Geological reserves have been calculated as 34,07,372 Tonnes falling under proved category (111) and the resources thus arrived as 6,34,492 Tonnes (221) due to statutory barrier and bench formation in mineral itself. The reserves were arrived based on the actual recovery of mineral the available reserves and hence the recoverable reserves will be the same.

ABSTRACT OF GEOLOGICAL RESERVES

S.No	BLOCK No.	PROVED RESERVES (111)	RESOURCES (221)	
			Safety Barrier	Bench Locked up
1	Block – 1	7,45,130	3,741	1,765
2	Block-2	10,01,674	11,269	1,21,293
3	Block-3	13,25,568	2,29,335	1,25,028
4	Block-4	3,35,000	28,094	91,373
TOTAL		34,07,372	2,72,439	3,69,459

In as much as the existence of mineral deposit is proved by earlier exploratory studies, the reserves estimation has been re-worked with reference to the norms stipulated under UNFC system and have been furnished as below:

Description	Quantum of Reserves (in Tonnes)	Category in UNFC system
Mineral Reserves		
Graphite Reserves	34,07,372	(111)
Remaining Resources		
Graphite Resources	3,69,459	(221)
Mineral locked up in benches		
Mineral locked up in 7.5m safety barrier	2,72,439	
Total updated Geological Reserves	40,41,864	

Figure No. 2

Geological plan

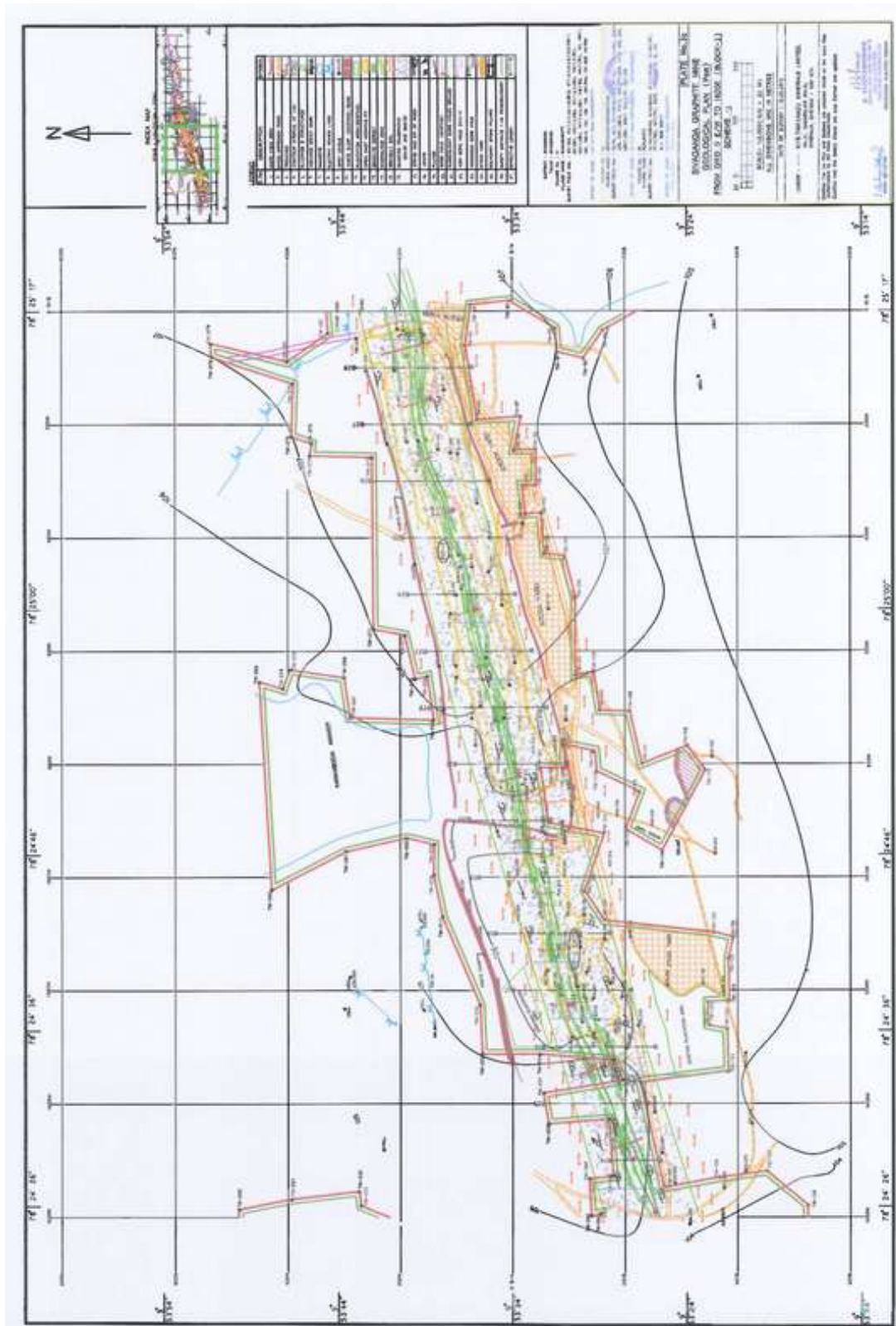
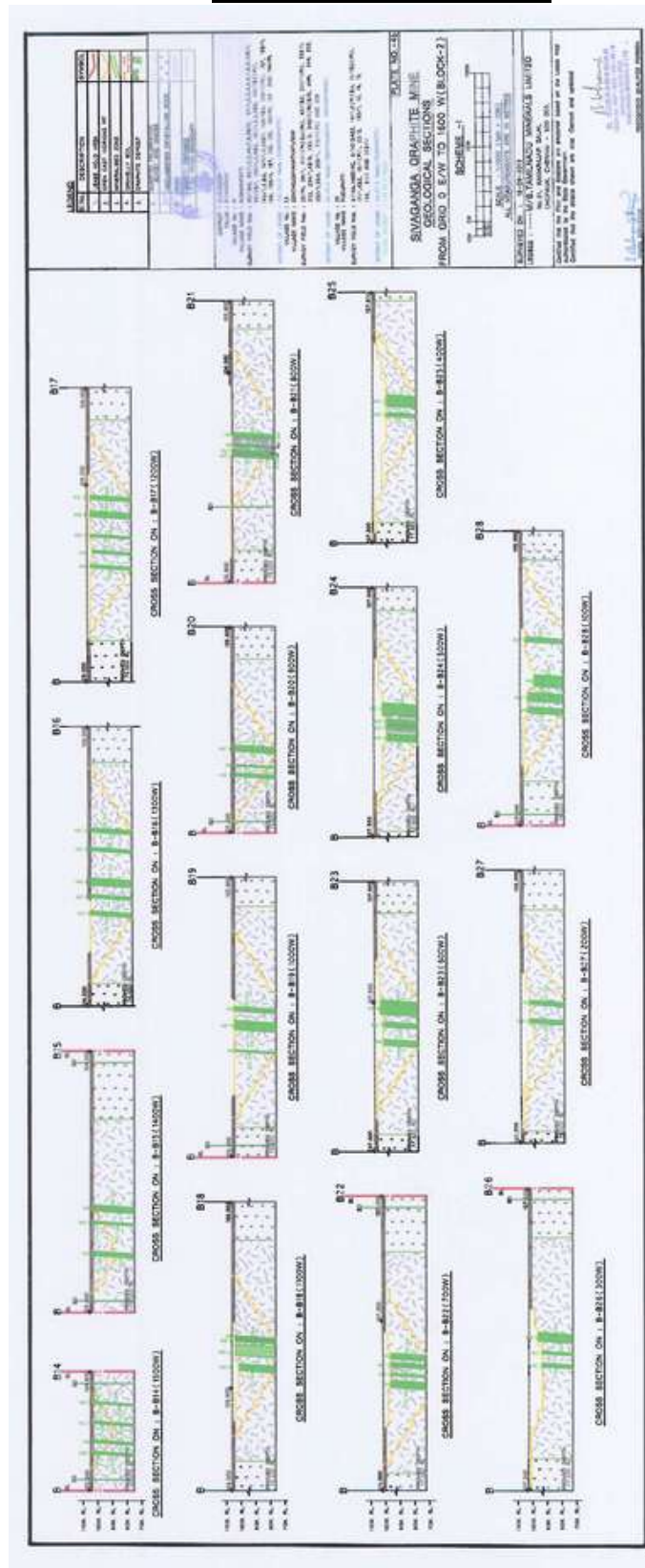


Figure No. 3

GEOLOGICAL SECTIONS



3.5.3 MINING METHOD:

The method of mining adopted is opencast “A” category (other than fully mechanized considering the following points.

Considering the fact that the graphite bands lies approximately 1.5m below the surface level, opencast method of mining is considered suitable and is exercised successfully. The graphite bands are near vertical and their existence has been proved by drilling beyond a depth of 30m from the surface.

Considering the above factors especially the thin overburden (1.5m), banded nature of the ore each extending for a length of 100m to 800m presence of three or more parallel bands, weathered nature of rocks for a depth of 30m and ore to waste ratio comes to about 1:4 upto a depth of 30m favour open cast mining. This is economically feasible keeping in view of maximum recovery of ore upto a depth of 30m as against selective band mining by underground method resulting in leaving many good quality ore bands without exploitation.

Presently there are four mining pits in the lease area. Besides, there are 5 old waste dumps and 2 top soil old dumps exist. Old external dumps located outside the lease area in the patta lands owned by the lessee will be stabilized, reclaimed with vegetative cover. Future external dumping is proposed within the lease area.

The surface layout plan showing the different mine pits, dump areas, etc. is shown in

Figure No - 4

While designing the mine the following basic Parameters have been considered.

No. of working days/year	:	300 days
No. of shifts / day	:	1 shifts of 8 hours
Working hours	:	8 A.M to 5 P.M
Bench height	:	1.5m (Top O.B.bench)
	:	5m (For ore)
Bench slope	:	60°
In situ density	:	a) 2.5 Tonnes / M ³ (for both ore and waste rocks) b) 1.6 Tonnes/M ³ (for overburden Gravelly soil)
Loose density	:	1.5 Tonnes/M ³ (for both ore & waste)

The ore bands along the trench Nos.28 to 39 over a strike length of 1000 m have been considered for the present scheme of mining, which will last for more than 30 years.

A thickness of 1.5m height of top lateritic soil is dozed out by using dozer or removed by excavator and loaded and transported to separate dump yard located in non-mineralized zone in southern side of working pit.

Since the graphite deposit occurs as bands of varying size between 0.3 m and 16m and dipping almost vertical and exploiting the graphite ore adopting a method of working along the strike direction to avoid contamination of overburden/inter Burden as well as to extract pure graphite ore from graphite bands. The graphite ore thus obtained is transported to stock yard for blending works.

3.5.3.1 PRODUCTION SCHEDULE:

Year wise planned production schedule of ore and waste for the next five years are tabulated below:-

Year	Location of Development with grid lines & Direction of advancement	Top R.L./Bottom R.L. (in m)	Total Graphite Production (in Tonnes)	Generation of waste (in Tonnes)		Total waste (in tonnes)	Ore of waste ratio
				Over burden	Side/inter Burden		
2014-15	Location: in between Trench 37 to 35. Grid Lines: In between 1200 West to 950 West & 50 South to 100 South Advancement West to East.	106.094 m to 84.815 m	1,03,450	28,508	3,42,732	3,71,240	1:4
2015-16	Location : in between Trench 39 to 37. Grid Lines: In between 1350 West & 100 South & 200 South Advancement West to East.	106.000m To 84.117m	1,02,365	35,773	3,06,428	6,42,201	1:6
2016-17	Location : in between Trench 33 to 31. Grid Lines: In between 900 West to 650 West & 50 North to 50 South Advancement West to East.	106.000m To 84.600m	1,04,791	7,796	3,92,766	4,00,562	1:4
2017-18	Location : in between Trench 32 to 30. Grid Lines: In between 700 West to 500 West & 50 North to 50 South Advancement West to East.	105.450m To 83.460m	1,04,557	1,260	2,58,670	2,59,930	1:3



2018-19	Location: in between Trench 30 to 28. Grid Lines: In between 550 West to 350 West & 100 North to 0 North Advancement West to East.	106.500m To 81.360m	1,01,125	597	2,77,718	2,78,315	1:3
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3.5.3.2 QUANTITY OF WASTES TO BE GENERATED (LIQUID & SOLID)

The waste encountered during scheme period is the overburden soil / inter burden and side burden. The yearly accumulation of waste is tabulated as below. The top soil covering is being dozed and kept at a specific location of the lease area for growing vegetation, afforestation etc.

The waste to be generated during entire mining is 11.32 Mil.Cum out of which 0.781Mil.Cu.m will be generated during the ensuing 5 year plan period.

The waste generated during the Mining Scheme period will be dumped on the Northern side of Pit-II extension. The maximum height of the dump in the present scheme period is around 20m with two benches each of 10m. The maximum height of the dump in the ultimate stage is expected to be 40m. The waste generated during the mining will be accommodated in the waste dump shown in the conceptual plan. **(Refer Figure No – 6).**

This solid waste will be stacked in mine waste dumps and suitable stabilization by afforestation. As far as liquid waste is concerned, no liquid waste will be generated.

Figure No- 4

SURFACE LAYOUT PLAN

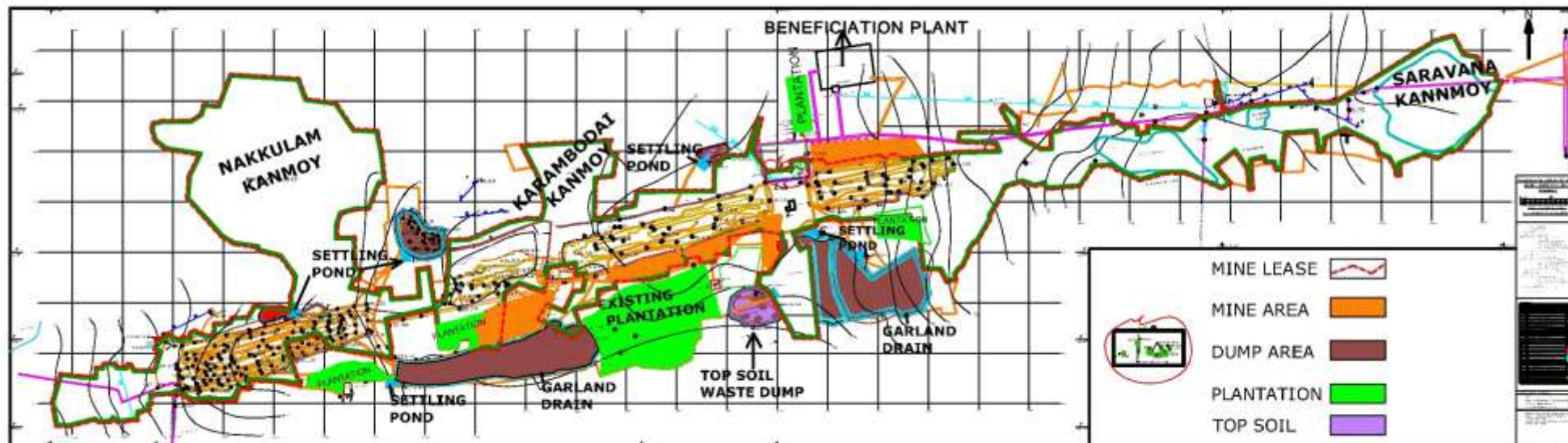
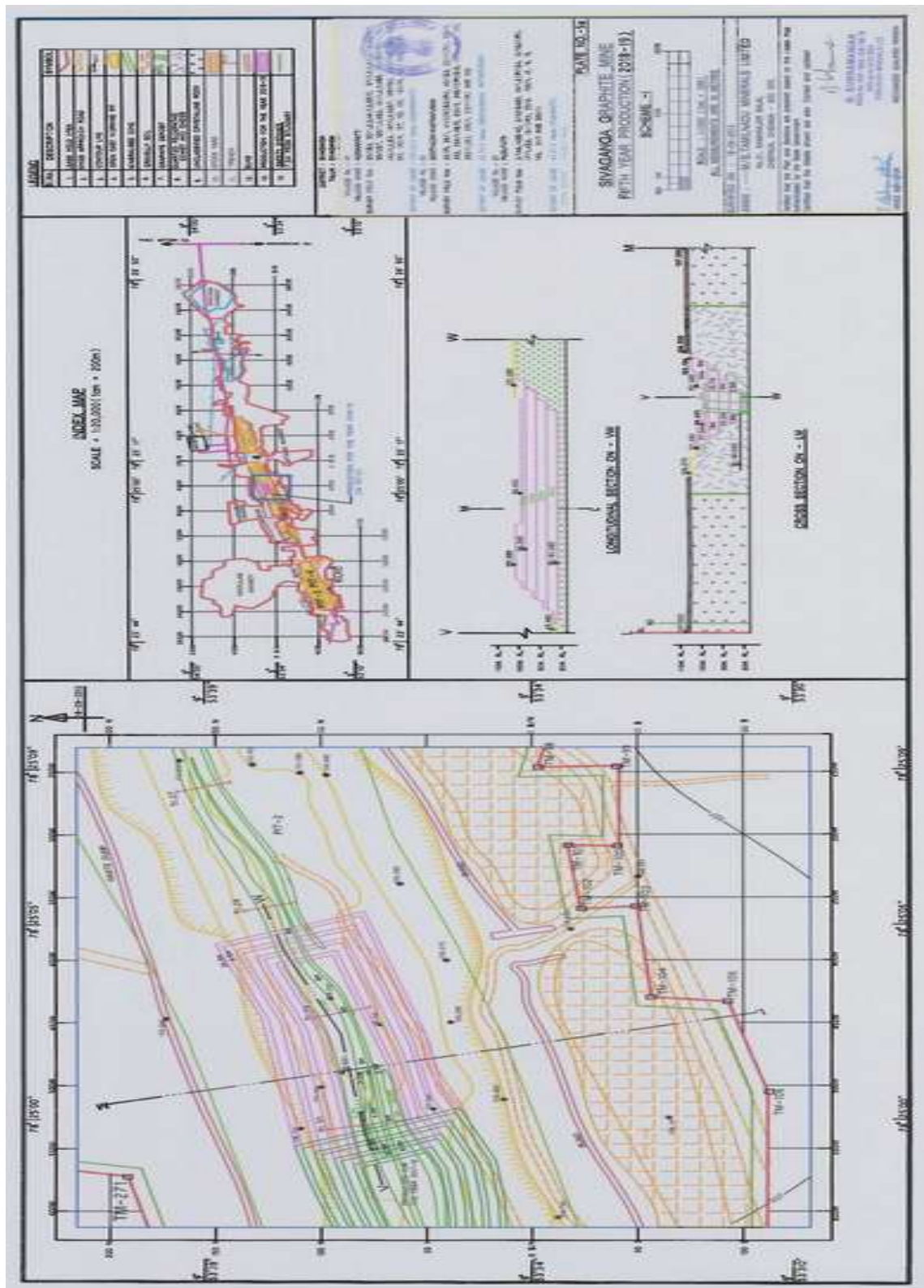


Figure No: 5

END OF V YEAR PLAN



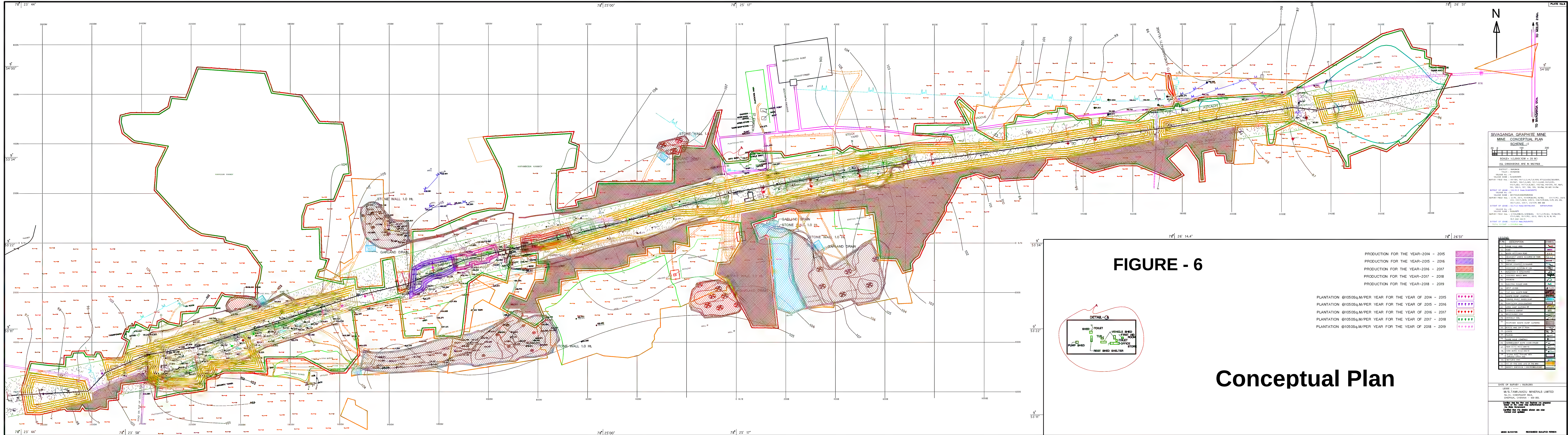


FIGURE - 6

Conceptual Plan

SIVAGANGA GRAPHITE MINE
MINNE CONCEPTUAL PLAN
SCHEME - I

SCALE = 1:2,000 (1 CM = 20 M)

ALL DIMENSIONS ARE IN METRES

DISTRICT : SIVAGANGA
TALUK : SIVAGANGA
VILLAGE NO. : 10
SURVEY FIELD NO. : 10/10A, 10/10B, 10/10C, 10/10D, 10/10E, 10/10F, 10/10G, 10/10H, 10/10I, 10/10J, 10/10K, 10/10L, 10/10M, 10/10N, 10/10O, 10/10P, 10/10Q, 10/10R, 10/10S, 10/10T, 10/10U, 10/10V, 10/10W, 10/10X, 10/10Y, 10/10Z, 10/10AA, 10/10AB, 10/10AC, 10/10AD, 10/10AE, 10/10AF, 10/10AG, 10/10AH, 10/10AI, 10/10AJ, 10/10AK, 10/10AL, 10/10AM, 10/10AN, 10/10AO, 10/10AP, 10/10AQ, 10/10AR, 10/10AS, 10/10AT, 10/10AU, 10/10AV, 10/10AW, 10/10AX, 10/10AY, 10/10AZ, 10/10BA, 10/10BB, 10/10BC, 10/10BD, 10/10BE, 10/10BF, 10/10BG, 10/10BH, 10/10BI, 10/10BJ, 10/10BK, 10/10BL, 10/10BM, 10/10BN, 10/10BO, 10/10BP, 10/10BQ, 10/10BR, 10/10BS, 10/10BT, 10/10BU, 10/10BV, 10/10BW, 10/10BX, 10/10BY, 10/10BZ, 10/10CA, 10/10CB, 10/10CC, 10/10CD, 10/10CE, 10/10CF, 10/10CG, 10/10CH, 10/10CI, 10/10CJ, 10/10CK, 10/10CL, 10/10CM, 10/10CN, 10/10CO, 10/10CP, 10/10CQ, 10/10CR, 10/10CS, 10/10CT, 10/10CU, 10/10CV, 10/10CW, 10/10CX, 10/10CY, 10/10CZ, 10/10DA, 10/10DB, 10/10DC, 10/10DD, 10/10DE, 10/10DF, 10/10DG, 10/10DH, 10/10DI, 10/10DJ, 10/10DK, 10/10DL, 10/10DM, 10/10DN, 10/10DO, 10/10DP, 10/10DQ, 10/10DR, 10/10DS, 10/10DT, 10/10DU, 10/10DV, 10/10DW, 10/10DX, 10/10DY, 10/10DZ, 10/10EA, 10/10EB, 10/10EC, 10/10ED, 10/10EE, 10/10EF, 10/10EG, 10/10EH, 10/10EI, 10/10EJ, 10/10EK, 10/10EL, 10/10EM, 10/10EN, 10/10EO, 10/10EP, 10/10EQ, 10/10ER, 10/10ES, 10/10ET, 10/10EU, 10/10EV, 10/10EW, 10/10EX, 10/10EY, 10/10EZ, 10/10FA, 10/10FB, 10/10FC, 10/10FD, 10/10FE, 10/10FF, 10/10FG, 10/10FH, 10/10FI, 10/10FJ, 10/10FK, 10/10FL, 10/10FM, 10/10FN, 10/10FO, 10/10FP, 10/10FQ, 10/10FR, 10/10FS, 10/10FT, 10/10FU, 10/10FV, 10/10FW, 10/10FX, 10/10FY, 10/10FZ, 10/10GA, 10/10GB, 10/10GC, 10/10GD, 10/10GE, 10/10GF, 10/10GG, 10/10GH, 10/10GI, 10/10GJ, 10/10GK, 10/10GL, 10/10GM, 10/10GN, 10/10GO, 10/10GP, 10/10GQ, 10/10GR, 10/10GS, 10/10GT, 10/10GU, 10/10GV, 10/10GW, 10/10GX, 10/10GY, 10/10GZ, 10/10HA, 10/10HB, 10/10HC, 10/10HD, 10/10HE, 10/10HF, 10/10HG, 10/10HH, 10/10HI, 10/10HJ, 10/10HK, 10/10HL, 10/10HM, 10/10HN, 10/10HO, 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DATE OF SURVEY : 18.05.2023

LESSOR : M/S. TAMILNADU MINERALS LIMITED
No. 31, KAMARAJAR SALAI,
CHENNAI - 600 005.

CERTIFIED THAT THE DATA SHOWN ARE TRUE AND CORRECT AND VALID

DATE : 18.05.2023

NAME SIGNATURE : _____

RECOMMENDED QUALIFIED PERSON : _____

3.5.1.5 DETAILS OF MACHINERY:

The following are the steps involved for winning Iron Ore.

S.No	NAME OF THE MACHINERY	CAPACITY	QUANTITY
1	Excavator TATA HITACHI 200 LC	1 m ³	03
2	Screw compressor 600 CFM Khosla NT 495-C 180	17 m ³ /min	03
3	Tipper Leyland	6 m ³	06
4	Tipper Tata	6 m ³	04
5	Diesel tanker Tata	2000 Liters	01
6	Explosives van-Swaraj Mazda	3,455 T	01
7	Tractor Ford 1362		01
8	Wagon drill	110mm dia	02
9	Jack Hammer 32mm dia. Operated with portable compressor	-	02

3.5.1.6 GRADE OF ORE:

The Sivaganga graphite is of flaky variety with 14% average Fixed Carbon used in the manufacture of refractory bricks, expanded graphite, crucibles and carbon brushes.

Graphite - Technical Details

TECHNICAL DETAILS OF FLAKY GRAPHITE:

Moisture Content – 0.2 to 0.5% (Max)

SPECIFICATION	GRAPHITE FLAKES F.C. GRADE							
	Upto 84%	85 - 87%	88 - 89%	90%	91%	92%	93%	94%
Fixed Carbon (Maximum %)	86-89	90	91	92	93	94	95	96
Volatile Matter (Maximum%)	2	2	2	1.8	1.8	1.5	1	1
Ash content (Maximum%)	12	8	7	6.2	5.2	4.5	4	3

3.6 LAND USE PATTERN:

Type of Lease Area : Non-Forest Land: 236-85.0 Ha
(Government Poromboke & Patta lands)

The present and during mining pattern are given below:

S.No	Description	Present Area (in Ha)	Land use at the end of SOM period (in Ha)	Conceptual period (in Ha)
1	Mining (Quarry)	32-60.0	33-57.0	67.88.0
2	Overburden/Side burden Dump	1-94.0	7-94.0	41.72
3	Storage for Topsoil	0-65.0	1-59.0	15.18
4	Infrastructure	0-72.0	0-72.0	1.50
5	Mineral stockyard	12-25.0	12.25.0	15.25
6	Mine Roads	5-20.5	5-20.5	7.20.5
7	Area Under plantation	5-46.0	5-98.5	10.46.0
8	Unutilized area	178-02.5	169-59.0	77.655
TOTAL		236-85.0	236.85.0	236.85.0

Mining operation so far have been restricted to a depth of 30 m from ground level by exploiting the proved reserves and probable reserves. Future mining operations till the end of the mining lease period will also be confined to 30 m depth only. But as drilling operations have indicated the persistence of graphite ore beyond 30 m depth, extending down to 100 m it is proposed not to close the mine & backfill at the expiry of present lease period. Hence the life of the mine may extend further and as such, mine closure is not planned now.

3.7 LIFE OF THE MINE:

Considering the present explored mineable reserves, the life of mines will be 32.5 years. Further if the project resource is converted in to proved category, the life of the mine is increase accordingly.

3.8 RAW MATERIAL REQUIRED ALONG WITH ESTIMATED QUANTITY, LIKELY SOURCE, MARKETING AREA OF FINAL PRODUCTS, MODE OF TRANSPORT OF RAW MATERIAL & FINISHED PRODUCT.

About 104791 T or 0.104 MTPA of Graphite will be produced from the mine and subjected to beneficiation.



Applications:

Graphite finds application in the manufacture of Mag - carbon refractory bricks for lining furnaces. Graphite crucibles for melting non-ferrous metals. Carbon brushes, Paints, Lubricants, Graphite brake lining and clutches for automobiles Pencils are produced from TAMIN Flaky graphite.

S. No.	GRAPHITE GRADES	PRICE PER METRIC TON
I. GRAPHITE FLAKES		
1.	Upto 84% FC to 96% FC	Rs.31,221/- to Rs.68,370/-
II. D.E. FINES		
2	D.E. Fines upto 84% F.C to 94% FC	Rs.38,000/- to Rs.40,101/-

The finished product is marketed to various consumers.

3.9 RESOURCE OPTIMIZATION / RECYCLING AND REUSE ENVISAGED IN

THE PROJECT:

BENEFICIATION :

Since the grade of the graphite is low, the beneficiation plant has been set up by TAMIN outside the lease area on the northern side to get graphite concentrate of required F.C. content. The plant is rated to process 200 TPD to yield 27.10 T of graphite concentrate of 96%F.C purity with 92.20% recovery. The process of beneficiation will include

- Crushing and screening
- Beneficiation by Froth Floatation
- Dewatering the concentrate
- Drying of concentrate
- Bagging of Concentrate
- Disposal of tailings

3.10 AVAILABILITY OF WATER ITS SOURCE, ENERGY/POWER REQUIREMENT & ITS SOURCE

3.10.1 WATER REQUIREMENT:

The water requirement for the mines is mainly for green belt, dust suppression and drinking water purpose & in beneficiation plant for make up purpose.

A.	INDUSTRIAL:	(m ³ /day)
	Water sprinkling, beneficiation, etc.	- 23
	Workshop.vehicles wash	- 4
	Green belt	- 11
B.	Domestic	- 2



TOTAL

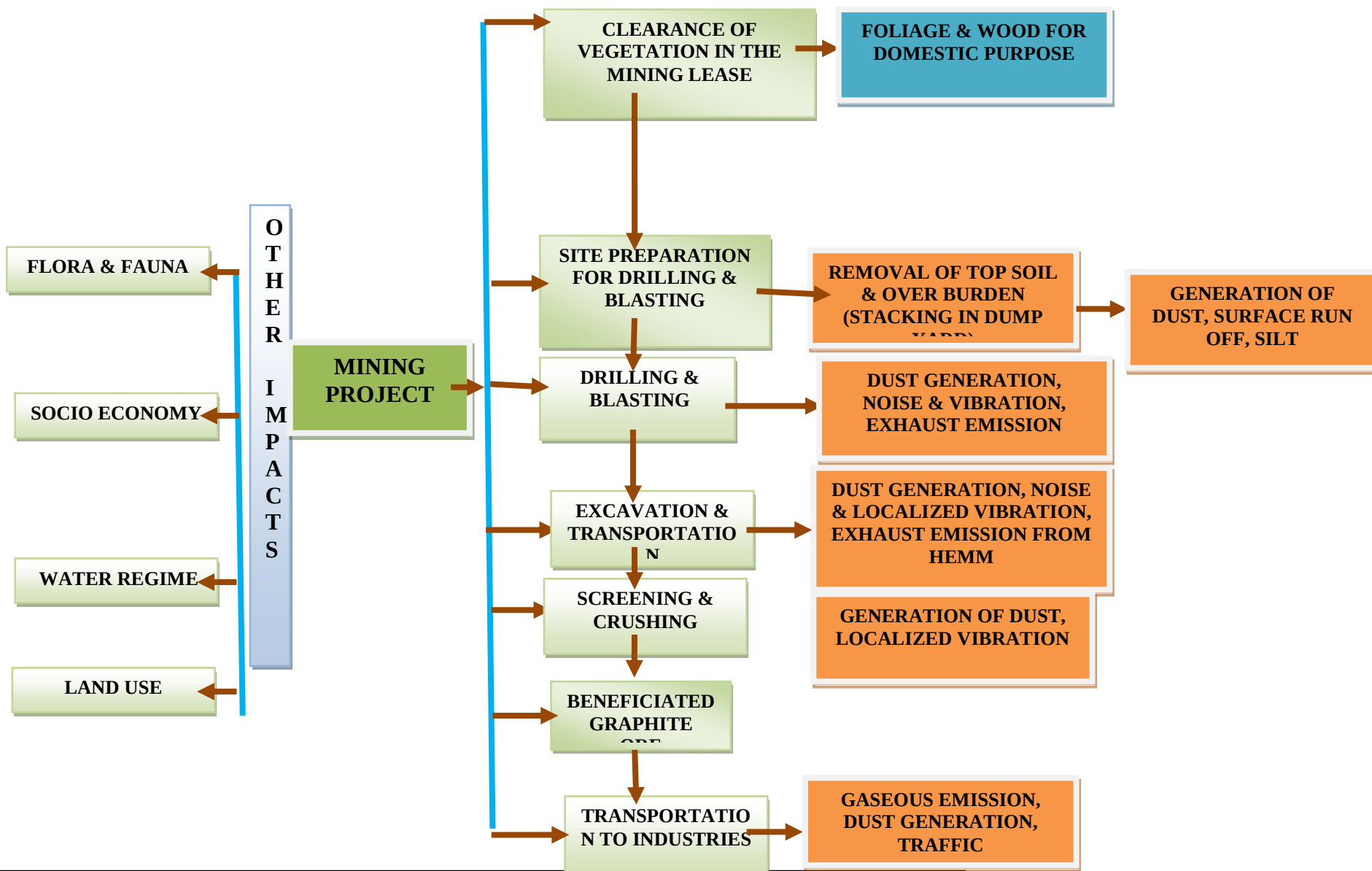
40
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The water requirement, as above, is being and will be met from TAMIN owned bore wells in the area. As these bore wells are located on the sheared/fractured zone, good ground water potential is available to meet the project water requirements.

3.10.2 POWER REQUIREMENT:

The power demand for the integrated mine and beneficiation plant is estimated to be 250 KVA for general lighting purpose. The power requirement will be met from the State grid and DG Sets.

3.10 Schematic representations of the feasibility drawing which give information of EIA purpose



CHAPTER – IV

SITE ANALYSIS

4.1 CONNECTIVITY

The graphite mine is located at 3 km, W of Pudupatti village on Sivaganga Melur Road (SH-34) and 7 km, NW of Sivaganga Town. The nearest Railway station is Sivaganga on Trichy-Rameswaram Melur gauge section and is 8 km from the mine. The site is quite accessible & has good communication & transport facilities.

4.2 LAND FORM, LAND USE & LAND OWNERSHIP:

M/s. TAMIN have been already carrying out graphite mining in this area for the past 3 decades in an area of 236.85 ha held by them under mining lease. Entire area of 236.85 ha, as above, is in TAMIN's possession.

4.3 TOPOGRAPHY

The terrain is of undulating nature. The ground elevation varies from 87 m to 108 m above mean sea level with slope towards south & south east. The surface gradient varies from 1 in 30 to 1 in 150 in the ML area. There are a few ponds spread over the ML area. But these are ephemeral in nature. Even during monsoon season, the water depth is less than 0.50 m in most of the ponds resulting in scanty storage.

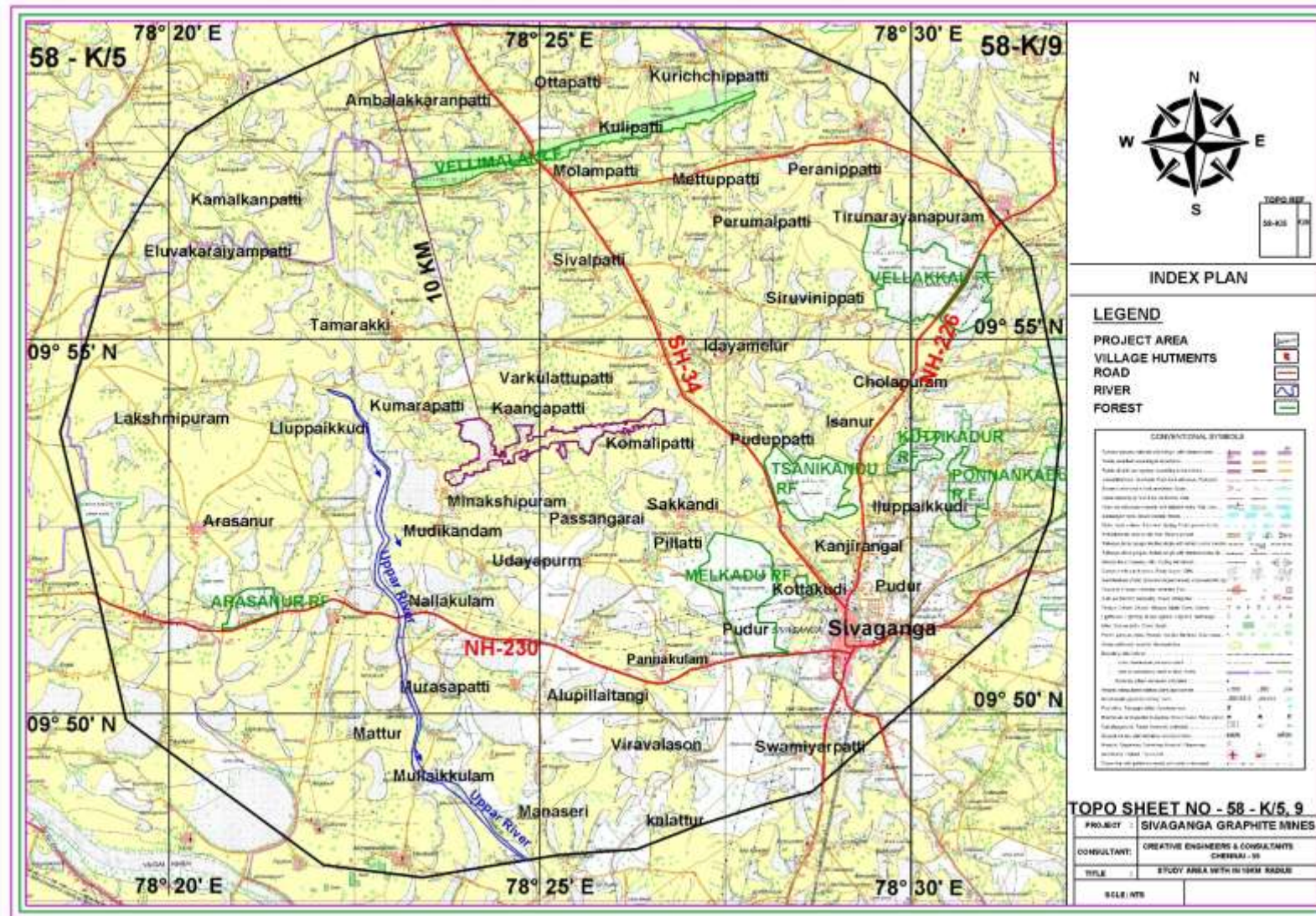
A seasonal River Uppar flows 1.5 km west of the area. This flows from northwest to south east direction and as this is rain fed river, it is mostly dry over the year.

As per Tamil Nadu Government's notification No.MS.No.127/E&F Dept/ EC III of 8.5.98 and MS No.(ID)223/E&F Dept/EC III of 2.9.98, establishment of highly polluting industries within 5 km from embankments of certain rivers and water bodies have been restrained and specified. Uppar River which is the only river near the mining lease, as mentioned above, is not specified in above mentioned Tamil Nadu Government's Notifications. Besides, mining industry is not covered in this notification. Hence, these restrictions/conditions do not apply for the TAMIN graphite mine.



INDEX PLAN

Figure No. 7



4.4 EXISTING LAND USE PATTERN

As already mentioned, the entire mine lease area of 236.85 ha Ha is non forest land in Tamin's possession.

4.5 EXISTING INFRASTRUCTURE:

This being a working mine, all the infrastructural facilities required like approach road, office, stores, etc is already developed.

4.6 SOIL CLASSIFICATION:

In the project area and the nearby locations, pH of the soil is normal. The texture of soil samples are generally sand clay loamy and sand clay type.

4.7 CLIMATIC DATA FROM SECONDARY SOURCES

The ML area is governed by the climatic conditions of Sivaganga district which is sub-tropical with moderate seasonal variations in the overall weather aspects.

Summer months are March to June with temperature normally varying between 35° to 40°. Mean maximum temp being 39.2°C in the month of May. Winter months of Dec to February are cooler with temperature varying between 20 & 25°C while mean minimum is 23 ° C. Humidity in monsoon varies from 52% to 70% while in summer it varies from 57 % to 78 %.

The area experiences an average Rainfall of 700 mm. Nearly 50% of the rainfall is experienced in the months of October to December due to North – east monsoon.

Wind direction is predominantly from North & North east with speeds normally varying between 3 to 10 kmph depending on the seasons.

4.8 SOCIAL INFRASTRUCTURE AVAILABLE

The core zone covers the revised mine lease area of 236.85 ha. The lands are falling in 3 revenue villages namely Pudupatti, Senthudayanathapuram and Kumarapatti villages of Sivaganga District in Tamil Nadu.

The basic amenities like education, medical, drinking water, communications etc., are given below as per 2001 census records.

Educational Facilities: 136 primary schools are available in the study area covering 52 villages. 33 villages have middle school. College facilities are available in Keelakkandani area.

Medical Facilities: All the villages have got general medical facilities.



Drinking water: All the villages are having drinking water facilities. Wells, tube wells and hand pumps are the major source of drinking water.

Communication: There are good approach roads in the form of State highway/ Panchayat roads passing through the major villages and metal roads link smaller villages. Bus communication is available in all the villages.

Post & Telegraph: Post office is available in all the villages.

* * * * *

CHAPTER – V

PLANNING BRIEF

5.1 PLANNING CONCEPT:

Planning concept is based on the following criteria:

- Technical feasibility and economic viability of the project.
- Possibility of increasing the grade of ore through beneficiation.
- Availability of market for committed grade of ore on long term basis.
- Absence of ecologically sensitive features.

5.2 POPULATION PROJECTION

The continuation of mining activity will definitely benefit the manpower both directly and indirectly.

The buffer zone encompassing 10 kms radius from the periphery of core zone consists of 52 rural villages from 3 Taluks namely Sivaganga, Manamadurai and Melur.

The study details based on 2001 census data are highlighted below:

- There are 32112 households in the buffer zone.
- The total population is 139020, of which males constitute 49.77% and females 50.23%.
- The scheduled caste population forms 12.20%.
- The scheduled tribe population forms 0.02%.
- The overall literacy rate is 64.76%, of which male literacy rate is 36.54% and female literacy rate is 28.22%.

5.3 LAND USE PLANNING

The present and during mining pattern are given below:

S.No	Description	Present Area (in Ha)	Land use at the end of SOM period (in Ha)	Conceptual period (in Ha)
1	Mining (Quarry)	32-60.0	33-57.0	67.88.0
2	Overburden/Side burden Dump	1-94.0	7-94.0	41.72
3	Storage for Topsoil	0-65.0	1-59.0	15.18
4	Infrastructure	0-72.0	0-72.0	1.50
5	Mineral stockyard	12-25.0	12.25.0	15.25
6	Mine Roads	5-20.5	5-20.5	7.20.5
7	Area Under plantation	5-46.0	5-98.5	10.46.0
8	Unutilized area	178-02.5	169-59.0	77.655
TOTAL		236-85.0	236.85.0	236.85.0

Mining operation so far have been restricted to a depth of 30 m from ground level by exploiting the proved reserves and probable reserves. Future mining operations till the end of the mining lease period will also be confined to 30 m depth only. But as drilling operations have indicated the persistence of graphite ore beyond 30 m depth, extending down to 100 m it is proposed not to close the mine & backfill at the expiry of present lease period. Hence the life of the mine may extend further and as such mine closure is not planned now.

5.4 ASSESSMENT OF INFRASTRUCTURE DEMAND (PHYSICAL & SOCIAL)

There are no rehabilitation or resettlement issues in this project. The graphite mine project provides continuous employment prospects to about 70 persons on direct basis. In graphite beneficiation plant will directly employ about 98 persons and indirectly about 200 persons will derive employment prospects through logistical schemes, trading, ancillaries, casual labor, etc.

TAMIN provides various facilities like canteen, dispensary, rest shelters, drinking water, housing allowance and transportation to its employees.

The physical infrastructure in the area has been considerably improved due to project operations through betterment of roads, lighting drinking water supply, educational progress, communicational improvements, etc. in the area.

The infrastructural facilities like road, communication and transport existing near the mine had a morale boosting effect on the villagers staying nearby. To promote awareness of the environment and ecology amongst the local inhabitants annual Environment Protection Week is being observed by the mine management. The modern facilities are available at TAMIN for proper care of workers and their safety and health status. The rural road development work taken up by TAMIN and the Government due to mining activities has boosted the economic status and quality of life of the villagers staying in nearby villages. The government provides these villages with macadam roads, electricity, telephone, telegraph and postal facilities.

5.5 AMENITIES/FACILITIES

All required amenities / facilities required for the mining activities like rest room, shelters, canteen, first-aid centre, magazine facilities, etc. are already well established in the area. All these are located at the non-mineralized zone situated outside the mine lease area. The same status, as above, will continue in future also.

* * * * *

CHAPTER – VI

PROPOSED INFRASTRUCTURE

6.1 INDUSTRIAL AREA

The project area does not fall in the notified industrial area.

6.2 RESIDENTIAL AREA (NON PROCESSING AREA)

The lands are falling in 3 revenue villages namely Pudupatti, Senthudayanathapuram and Kumarapatti villages of Sivaganga District in Tamil Nadu.

The entire land is under possession of TAMIN. There are no hutments / houses in the mine lease area.

6.3 GREEN BELT

Green belt development will be carried out in all possible area comprising in the safety zone around mine lease, etc. Presently 5.46 Ha is covered under green belt within the mining lease area and ultimately during the conceptual period an area of 10.46 Ha will be covered by green belt. Besides the external dumps (Existing and Proposed) along with re-handled top soil, Mineral stock yard and possible un-utilised areas will be covered by afforestation/green belt.

6.4 SOCIAL INFRASTRUCTURE

Good social infrastructural facility exists in the area. However, these facilities will be suitably upgraded to meet the increased requirements.

6.5 CONNECTIVITY

The graphite mine is located at 3 km, W of Pudupatti village on Sivaganga Melur Road (SH-34) and 7 km, NW of Sivaganga Town. The nearest Railway station is Sivaganga on Trichy-Rameswaram Melur gauge section and is 8 km from the mine. The site is quite accessible & has good communication & transport facilities.

6.6 DRINKING WATER MANAGEMENT (SOURCE & SUPPLY OF WATER)

The water requirement for the mines is mainly for green belt, dust suppression and drinking water purpose is 40 KLD.

The water requirement, as above, is being and will be met from TAMIN owned bore wells in the area. As these bore wells are located on the sheared/fractured zone, good ground water potential is available to meet the project water requirements.



6.7 SEWERAGE SYSTEM.

The domestic waste water is being passed through the soak pit. These measures will be suitably augmented.

6.8 INDUSTRIAL WASTE MANAGEMENT

The beneficiation plant is located outside the lease area. Hence the question of industrial waste does not arise.

6.9 SOLID WASTE MANAGEMENT

The details of solid waste generation from the mine and its management is given in para 3.5.3.2 of Chapter – III.

6.10 POWER REQUIREMENT & SUPPLY/SOURCE

The power demands for the integrated mine and beneficiation plant is estimated to be 250 KVA for general lighting purpose. The power requirement will be met from the State grid and DG Sets.

* * * * *



CHAPTER – VII

REHABILITATION & RESETTLEMENT (R&R) PLAN

The proposed expansion will be in the existing mine lease area. The entire mine lease area is in TAMIN's possession. There are no home owners or land owners and hence the question of rehabilitation and resettlement does not arise.

* * * * *

CHAPTER – VIII

PROJECT SCHEDULE & COST ESTIMATES

8.1 LIKELY DATE OF START OF CONSTRUCTION & LIKELY DATE OF COMPLETION

This being a working mine, the envisaged production quantity will be achieved in a in the first year of the scheme period itself.

8.2 ESTIMATED PROJECT COST ALONG WITH ANALYSIS IN TERMS OF ECONOMIC VIABILITY OF THE PROJECT.

I) CAPITAL COST:

Mines:

This being an existing mine in operation for the last 3 decades and capital cost is Rs.200 lakhs. The existing mining equipment and facilities will itself be utilised for expansion quantity

OPERATING COST (PRODUCTION COST):

The estimated production cost per MT of graphite is expected to be Rs.600/ per tonne. Since the entire ore will be utilized in the captive beneficiation plant nearby and there is good demand for processed graphite.

From the above it is clear that **the project is Techno economically viable** due to the following reasons:

- Exploration is carried out and the reserves are mostly in the proved category
- There is a good demand for the finished graphite because of many consuming industries.
- The graphite mine is located at 3 km, W of Pudupatti village on Sivaganga Melur Road (SH-34) and 7 km, NW of Sivaganga Town. The nearest Railway station is Sivaganga on Trichy-Rameswaram Melur gauge section and is 8 km from the mine. The site is quite accessible & has good communication & transport facilities.
- The selling price is more than the production cost and hence it is economically viable.

* * * * *

CHAPTER –IX

ANALYSIS OF PROPOSAL (FINAL RECOMMENDATIONS)

Financial & social benefits with special emphasis on the benefit to the local people including tribal population, if any, in the area.

The existing mining operations in the area have already brought about positive impact locally by way of employment generation, increase in income generation, creation of infrastructural facility, marked improvement in the life style and living standards of population of the surrounding area.

There will be continued substantial improvement in case of local population in living standards, receipt of per capita income, cultural patterns, living styles, educational standards, etc. by the continuation of the project.

There will be continual improvements of the local amenities like roads, communication, electricity, water supply, educational & recreational facilities, hospitals/ dispensaries, libraries, availability of variety of goods & services and other basic amenities needed for the local society.

As already mentioned earlier, the project will improve the social and physical infrastructural patterns of this interior area in its own way resulting in overall improvement of HDI (Human Development Index). Besides, the Central and State Government will also derive good financial benefits by way of receipt of taxes, duties and cess.

In view of above aspects of the project, the project can be said to be beneficial to the local community, the local region, the State and to the entire country on the whole.

Besides, this project is the only major industrial unit in the Sivaganga region, which is devoid of any other industrial ventures. Hence, from the points of view of local community employment and development of this rural backward area, continuation of the project assumes great importance.

* * * * *

ANNEXURES

Annexure - 1

DETAILS OF SURVEY NUMBERS COVERED UNDER MINING LEASE AREA

	Name of the Villages	Survey Nos	Extent in Ha
SIVAGANGAI TALUK & DISTRICT TAMILNADU	Kumarapatti	89/1,2,3,4,5,6&7,90/1,4A,4B,4C,4D,4E,3,5,6,7,8,9,10 & 2, 97/1,2,3,4,5,6,7,8,9,10&11,99/5&7, 100/1,2,3,4 & 5, 101/3,1,2,4&5,142/3,4,5,6,7&1, 143/1,2,3,4 & 5, 147/1,2,4,5,6&7,148/1,2,3 & 4, 149/1&2, 167/1,2,3&4, 168/1,2,3,4&5,194,196/4,5&6, 197/1&2,199,184,139,144	130.53.5
	Senthiudayna thapuram	32/2&4, 39/1&3,41/1&3, 42/1&2,231/1,2,3,4,6A,6B,7A,7B,8A,8B,9A&9B, 232/1,2,3&4,233/1,2,3,4,5,6,7,8,9&10 234/1,4,5,6,7,8,9&10,235/3,4&5,248/2,4,6,7,8,9&10,44,249,250,282/1,2&3,309/1,2,11,12,13&14, 312/1,7 & 308	62.74.0
	Pudupatti	3/14,17,18A & 18B,6/7,4D & 4E,14/2,3 & 1,15/2&1, 17/1,3,4,5,6&7,19/1,2,13&22,20/2&5,150/1,12, 16,18,149,51/1,302/11	43.57.5
		Total	236.85.0

MINE LEASE DEED

14

Mining lease deed executed on 16.5.87

GOVERNMENT OF TAMIL NADU
ABSTRACT

Mines and Minerals - Mining lease for graphite, Puzumpon Muthuramalingam District, Sivagangai Taluk, over an extent of 237.39.5 hectares in Senthiludayanthapuram, Padupatti and Kumiripatti villages. Grant of application of Tvl. Tamil Nadu Minerals Ltd. Madras - 334/108.

INDUSTRIES (D2) DEPARTMENT

G.O. Ms. No. 1327 dt. 24.12.86

1. From the Chairman and Managing Director, Tamil Nadu Minerals Ltd. Lr. Ref. No. 161/0479 dt. 30.6.79

2. G.O. Ms. No. 1723, Industries, dt. 20.12.80

3. From the Director of Industries and Commerce, Lr. D. No. 11706/83/79 dt. 11.2.81

4. Govt. Lr. No. 11104/D2/81-2, Industries, dt. 7.4.81

5. From the Collector, Puzumpon Muthuramalingam District, Sivagangai, D.O. No. M. 39/85 dt. 20.7.85

6. From the Chairman and Managing Director, Tamil Nadu Minerals Ltd. D.O. No. 3760/MCC-1/82 dt. 8.10.85

ORDER:

1. Tvl. Tamil Nadu Minerals Ltd. have applied for a mining lease for graphite over an extent of 238.68.5 hectares of lands in Senthiludayanthapuram, Padupatti and Kumiripatti villages, Sivagangai Taluk, Puzumpon Muthuramalingam District for a period of 20 years.

2. The Collector of Puzumpon Muthuramalingam District has recommended for an extent of 237.39.5 hectares after deducting an extent of 1.29.0 hectares to be set apart for communal and other purposes. The Director of Industries and Commerce has forwarded the mining lease application to the Government to pass suitable orders.

3. In exercise of the powers conferred under Section 10(3) of the Mines and Minerals (Regulation and Development) Act 1957 (Central Act 67 of 1957), the Governor of Tamil Nadu hereby sanctions the grant to Tvl. Tamil Nadu Minerals Ltd., Madras, of a mining lease for graphite for a period of 20 years over an extent of 237.39.5 hectares as detailed in Appendix-I to this order in Senthiludayanthapuram, Padupatti and Kumiripatti villages, Sivagangai Taluk, Puzumpon Muthuramalingam District, subject to the conditions mentioned in sub-rule (1) of rule 27 of the Mineral Concession Rules 1960 and also to the conditions specified in Appendix to this order.

4. The rates of royalty, dead rent and surface rent shall be as follows:-

/pto/

-2-

- ROYALTY: (a) with 80% or more fixed carbon: Fifty Rupees per tonne.
 (b) with 40% or more fixed carbon: thirty rupees tonne, but less than 80% fixed carbon.
 (c) with less than 40% fixed carbon: Twelve rupees tonne.

DEAD RENT: 1) First Year : Nil

ii) Second Year to fifth year: Rs.12.50 per hectare per annum.

iii) Sixth year to tenth year: Rs.25.00 per hectare per annum.

iv) Eleventh year onwards: Rs.37.50 per hectare per annum.

Surface rent and water rate: At such rate as the Land Revenue and Cesson assessable on the land are paid.

5. The applicant should pay a deposit of Rs.1,000/- prescribed in rule 32 of the Mineral Concession Rules, 1904 before the lease is actually executed.

6. The terms and conditions stated in this order are subject to such further modifications, additions and alterations as may be included in the lease deed when finalized.

7. The Collector of Pudukottai District is requested to take necessary further action for the execution of the lease deed. As soon as the deed is executed, the details of such execution should be reported to the Government and the Director of Geology and Mining.

(BY ORDER OF THE GOVERNOR)

V. SELVARAJ,

Commissioner, Pudukottai District.

To
 The Director of Geology and Mining, Madras-32.
 The Collector of Pudukottai District,
 Sivagangai (with records) By R.P.A.D.
 Thiruvallur Taluk Madras Minerals Ltd, Chappak, Madras-5.
 Copy to:
 The Controller, I.B.M. Bangalore-24, Civil Lines, Madras.
 The Regional Inspector of Mines, Oregium, Kolar Gold Field,
 Karnataka State.
 The Secretary to the Government of India, Ministry of Steel and Mines (Department of Mines), New Delhi.
 Industries (D) Department, Madras-5.

/Permitted/By order/

M.P.24.12.

SECTION OFFICER.



APPENDIX

The transport permit (with despatch slip) if necessary in the case of bulk permits may be issued at the request of the lessee on collection of royalty for the quantity of mineral mined from the lease hold area and ready to be transported. No bulk permit for larger quantity in anticipation of mining of the minerals should be issued, as this may lead to advance collection of royalty which was objected to by the Government of India, unless the lessee is willing to pay in advance for his own convenience. The accounts relating to the collection of actual royalty or dead rent should be reconciled at the end of the year before 10th January of the succeeding year.

2. The lessee shall pay before the expiry of the lease or its earlier determination by either party an amount equal to the annual dead rent or such fixed amount as may be fixed by the Collector of the District in his discretion as compensation for damage to the land covered by the lease.

3. The lessee shall not fell trees, if any, without the previous permission of the Collector and if it is found that he has felled any trees without such permission he shall pay the value of the trees together with a compensation fee subject to a maximum of ten times the value of the said trees.

4. The lessee shall not operate on the surface of any area prohibited by any authority by laying out roads, erecting buildings, machinery etc., without the previous permission of such authority of the State Government.

5. The lessee shall not use land for surface occupation without giving prior notice to the Collector.

6. The lessee shall provide and shall keep at all times at or near the pit head all equipment of weighing machines of modern type to the satisfaction of the Collector for weighing the minerals collected by him.

7. The lessee will exercise the liberties and powers hereby granted in such manner as to offer no unnecessary or reasonable avoidable obstruction or interruption to the development and working of any minerals not included in this lease and will at all times afford to the Government and to the holder of prospecting licences or mining leases in respect of any such minerals or any minerals within any limits adjacent passage upon and across the said lands to such minerals for the purpose of getting working, developing and carrying away the same.

8. The lessee shall take such precautions as are necessary to secure pits and shafts by putting up wire fencing or such other protection to the satisfaction of the Collector to prevent accidents.

9. That on the occurrence of any accident the lessee shall report such accident immediately to the nearest police station, the nearest factory, hospital and the labour Commissioner.

-2-

10. The lessee shall execute an indemnity bond to Government against the claims of third parties.

11. The lessee will at the expiration or sooner determination of the said term deliver unto the Governor all mines pits, shafts, including drifts, levels, waterways, airways and other workings (existing), thereafter to be sunk or made under the said lands (except such as may have been abandoned with the sanction of the Government or in any ordinary and fair course of working) and all (engine, machinery, plant buildings, structures and other work and conveniences which at the commencement of the said term were upon or under the said lands and all Engines, Machinery, Plant and fixtures not by the lessee below ground level which cannot be removed without causing injury to any mines or works under the said lands (except such of the same as may with the sanction of the Governor have become disused and all buildings and structures of brick or stone erected by the lessee above ground level in good repair order and condition and fit in all respects for further working of the said minerals).

12. If after the determination of the lease there shall remain in or upon the said lands any engines, machinery, plant, buildings, structures, tramways, railways and other works, erections and conveniences of minerals or mineral ores other property which the lessee is entitled to remove from the land the same shall, if not removed by the lessee within one calendar month after notice in writing requiring their removal is given to the lessee by the Collector be deemed to become the property of the Government of Tamil Nadu and may be sold in such manner as they shall deem fit without liability to pay any compensation or to account to the lessee in respect thereof.

13. In the event of the existence of state of war or of grave national emergency (of which the President of India shall be the sole judge and a notification to this effect in the Gazette of India shall be conclusive proof) the Governor after notice in writing to the lessee under the hand of any Secretary to Government of his own intention so to do may forthwith take possession of and assume control of the works, plant and machinery and premises of the lessee at or in connection with the said mines and may proempt at prices fixed by the Governor all the minerals and all products thereof extracted from or lying upon the said mines during such possession or control and the lessee shall confirm and obey all directions given by or on behalf of the Governor regarding the use or employment of such works, plants premises provided that a fair compensation which shall be determined by the Governor and shall be paid to the lessee for all loss or damage sustained by reasons or in consequence of the exercise of the powers shall not determine the said term hereby created or affect the terms and provisions of these presents further than may be necessary to give effect to the provisions of this clause.

...



4-13-

-3-

14.(a) the Lessee shall not enter upon or commence prospecting or mining operations in any reserved forest situate upon the said land without thirty days previous notice in writing to the District Forest Officer or without obtaining any written sanction of that officer or otherwise than as prescribed with such condition as that officer may in his absolute discretion prescribe.

b) the area within the reserved forest limits must be demarcated by a double line of 50 feet width which will be cut and kept clear by the Forest Department at the expense of the Lessee;

c) the Lessee must at all times permit the Forest Department to enter upon the land for the purpose of maintaining or repairing existing boundary lines within the area, and must pay the cost of such maintenance of repair as determined by the District Forest Officer;

d) the Lessee must take suitable precautions to prevent fire from spreading into the adjoining reserved forest from the land and if such fire accidentally occurs he must render all possible assistance in putting them out;

e) the Lessee shall not cut any trees or wreath on the area granted in excess of 20 per cent. of the number of trees on the whole area under the lease without the previous permission of the District Forest Officer and the value of such trees etc. shall be paid for by the Lessee at rates to be fixed by the District Forest Officer, he must not deface or interfere with any boundary stone or mark, if any boundary mark is accidentally damaged he must bring the matter immediately to the notice of the Range Officer.

15. The Lessee should keep the stock of beryl or any other prescribed substance under section 3 of the Atomic Energy Act, No. XXIX of 1948, if they occur in the property covered by the lease with a view to making them available to the Government of India.

P. SIVAKUMAR,
Commissioner & Secretary to Government.

// True copy //

11/11/2019
Section Officer. (11/11/2019)



APPLICATION FOR LEASE RENEWAL**Annexure – 3**

Lr.No.25203/MLI/2005

Dated:24 .04.2006

To
The Secretary to Government,
Industries Department,
Secretariat,
Chennai 600 009.

Through: The District Collector, Sivaganga/
The Director of Geology & Mining, Guindy, Chennai 32.

Sir,

Sub: Major Minerals – Graphite – Sivaganga Taluk & District –
Padupatti, Senthudayanathapuram and Kumarapatti Villages
S.F.Nos(enclosed) - Over an extent of 236.85.00 Hects. - Renewal
of Mining Lease application sending - Grant of Mining Lease to
TAMIN - Requested – Regarding.

Ref: 1) G.O.Ms.No.1328/ Industries(D2) Department dt.24.12.1986
2) Lead deed execution dated.16.05.1987

In the reference 1st cited, the Government have granted Mining Lease in respect of Padupatti, Senthudayanathapuram and Kumarapatti Village S.F.Nos. (as enclosed in the Annexure I) over an extent of 237.39.50 Hects. in Sivaganga Taluk and District for a period of 20 years for mining Graphite Minerals. The lease period is valid upto 15.05.2007.

2. As per the MCR 1960, we hereby submit Renewal of Mining Lease application in Triplicate in respect of Padupatti, Senthudayanathapuram and Kumarapatti Villages in S.F. Nos.(as indicated in the Annexure I) over an extent of 236.85.00 Hects. in Sivaganga Taluk and District along with the following records for grant of Renewal of Mining Lease for a further period of 20 years based on latest FMD, Adangal and Abstract of 'A' Register,

p.t.o.



- 1) Mining Lease application (in Form J) in Triplicate.
- 2) Copy of incorporation certificate.
- 3) List of Board of Directors.
- 4) Copy of Income Tax clearance certificate and Lr No. F.No.153/191/2002/TPI. of Ministry of Finance & Company Affairs Department of Revenue, Government of India.
- 5) FMB, TOPO-Sketches showing the area for which Renewal of Mining lease applied for
- 6) Adangal and Abstract of 'A' register.
- 7) Sworn Affidavit furnished for the details of lease hold areas existing/applied/being applied simultaneously of TAMIN.
- 8) Mining Due Clearance certificate obtained from District Collectors concerned and an affidavit in lieu of No Mining due clearance certificate.
- 9) Authorisation letter to sign all Mining Lease application documents on behalf of the Chairman & Managing Director.

Therefore, we request the Government to grant Renewal of Mining Lease over the subject area for a further period of 20 years to TAMIN, at the earliest.

Thanking you,

Yours faithfully,
for TAMILNADU MINERALS LIMITED,

for CHAIRMAN & MANAGING DIRECTOR

Annexure – 4

RECENT MINING SCHEME APPROVAL LETTER FROM IBM

Speed post ✓

GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES
AND THE REGIONAL CONTROLLER OF MINES

For No 044-249/11295
Tel: (044) 2491448/11570
Email: IOA.chennai@ibm.gov.in

G-4-A, Rajaji Bhawan
CGO complex, Brachm Nagar
Chennai – 600 059.

Date: 03.09.2014
13 SEP 14

No TNMG/UGRMS-1123 M13

To:
M/s. Tamilnadu Minerals Limited
No.31, Kamarajar Salai
Chennai – 600 006.

Sub: Approval of Scheme of Mining including PMCP in respect of your Sivaganga Graphite Mine over an area of 236.85 G Acre in SF No.89/146 etc. in Kamarapet, Senthudayanebiyapuram & Pudukottai Villages, Sivaganga Taluk & District, Tamilnadu submitted under rule 12 of MCDR, 1988 in favour of M/s. Tamilnadu Minerals Limited

Ref: Party letter Ref No 11595/M.1/2006 dated 27.04.2014.

Sir,

In exercise of the power conferred by sub-rule (4) of rule 17 of Mineral Conservation and Development Rules, 1988, I hereby approve the aforesaid Scheme of Mining (including Progressive Mine Closure Plan). This approval is subjected to the following conditions:

1. The scheme of mining (including Progressive Mine Closure Plan) is approved without prejudice to any other laws applicable to the mine / area from time to time whether made by the Central Government, State Government or any other authority.
2. The scheme of mining (including Progressive Mine Closure Plan) is approved without prejudice to any other order or direction from any court of competent jurisdiction.
3. It is also clarified that the approval of your aforesaid scheme of mining (including Mine Closure Plan) does not in any way imply the approval of the Government in terms of any other provisions of the Mines & Minerals (Development & Regulation) Act, 1957 or the rules framed there under and any other laws.
4. It is further clarified that the approval of the Scheme of Mining (including Progressive Mine Closure Plan) is subject to the provisions of Forest (Conservation) Act, 1980, Forest Conservation Rules, 2003 and other relevant statutes, orders and guidelines as may be applicable to the lease area from time to time.
5. A copy of EIAEMP report, approved by MOEF, New Delhi, should be submitted to this office within one month of its approval along with a copy of their approval letter.
6. Provisions of the Mines Act, 1952 and Rules and Regulations made there under including submission of notice of opening, appointment of manager and other statutory officials as required under the Mines Act, 1952 shall be complied with.
7. The execution of mining plan / scheme of mining shall be subjected in violation of prohibitory orders / notices, if any.

12

8. The Environmental Monitoring Cell of the Company shall continue monitoring ambient air quality, dust fall rate, water quality, soil sample analysis and noise level measurements on various stations established for the purpose both in the core zone and buffer zone, as per Department of Environment guidelines and keeping in view IBM's Circular No.3/02, season-wise every year or by engaging preferably the services of an Environmental laboratory approved by MOEF/CPCB. The data so generated shall be maintained in a bound-paged register kept for the purpose and the same shall be made available to the inspecting officer on demand.
9. If anything is found to be concealed as required under the Mines Act in the contents of the Scheme of Mining and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect, further at any stage, if it is observed that the information furnished in the document are incorrect or misrepresent facts, the approval of the document shall be revoked with immediate effect.
10. The validity period of the financial assurance should be renewed before the expiry of the same.
11. Yearly report as required under Rule 23F(2) of MCDR, 1988 setting for the extent of protection and rehabilitation work carried out as envisaged in the approved progressive mine closure plan and if there is any deviations, reasons thereof shall be submitted before 1st July of every year to the regional office, IBM, Chennai.
12. In case mining lease falls within radius of 10 kms of National Park/Sanctuary, recommendations of NWML have to be obtained as per the Order of Hon'ble Supreme Court in LA.No.400/2004.
13. This approval of mining operations and associated activities is restricted to the mining lease area only. The mining lease area is as shown on the statutory plans under rule 28 of Mineral Conservation and Development Rules, 1988, by the lessee/RDP/applicant. Indian Bureau of Mines does not take any responsibility regarding correctness of the boundaries of the lease shown on the ground with reference to lease map and other plans furnished by the applicant/lessee.
14. The contents of Circular No.2/2010 issued by the Chief Controller of Mines, Indian Bureau of Mines, Nagpur vide his letter No.11013/3MP/90-CCOM/Vol.V3 dated 03.04.2010 shall be complied with.
15. The Scheme of Mining is approved for proposal contained therein and as applicable from the date of approval of the document for the mining activities to be carried out within the mining leasehold.

End : Copy of approved scheme of mining
(including PMCP)

Yours faithfully,


(T.K. Rath)

Regional Controller of Mines.

Copy to:

1. Shri B.Subramanian, RQP, M/s. Tamilnadu Minerals Limited, No.31, Kamarajar Salai, Chetpak, Chennai – 600 005.
2. The Commissioner of Geology & Mining, Government of Tamilnadu, Guindy, Chennai – 600 032, along with a copy of the approved scheme of mining.
3. The Director of Mines Safety, No.46(pld), New No.5, 2nd street, block AA, Anna Nagar, Chennai – 600 048, along with a copy of the approved scheme of mining.
4. The Controller of Mines (C), Indian Bureau of Mines, Bangalore along with a copy of the approved scheme of mining.

End : As above.


(T.K. Rath)

Regional Controller of Mines.

Annexure – 5

TOR for Project area of 319.01 Ha Ha (Comprising 236.85 Ha of ML area and 82.16 Ha external dump area outside the lease)



Sub: Sivaganga Graphite Mine of M/s Tamil Nadu Minerals Ltd., village Kumarapatti, Senthudayanathapuram & Pudupatti, District Sivaganga, Tamil Nadu – Prescribing of TOR - Regarding.

Reference is invited to your letter no. 11595/MLI/2006 dated 1.5.2010 along with the application in the prescribed format (Form-I) and a copy of the project report to prescribe the TORs for undertaking detailed EIA study for the purpose of obtaining environmental clearance under the provisions of the EIA Notification, 2006 in respect of the above mentioned project.

2. The proposal is for renewal of mine lease, which fall due since 2007 for production of 60,000 TPA of graphite. The mine lease area is 236.85 ha. In addition, 82.16 ha of area for waste dump outside the mine lease also forms part of the project area. Thus, the total project area will be 319.01 ha. No forestland is involved. Mine working will be opencast semi-mechanised. Water requirement is 40 kld. No beneficiation plant is proposed as part of this project.

3. Based on the information contained in the documents submitted and the presentation made before the Expert Appraisal Committee (EAC) for mining projects during its Meeting held on July 26-28, 2010, the following TORs are prescribed:-

- (i) A copy of the relevant Rules and Guidelines issued by the State Government in relation to distance w.r.t. rivers and other water bodies and how these Rules and Orders are relevant to the instant proposal. Details of the restrictions / conditions, if any, imposed by the State Government for operating the said mine keeping in view the location of the river.
- (ii) Year-wise production details since 1994 onwards 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 coming into force w.r.t. the highest production achieved prior to 1994.

- (iii) A copy of the document in support of the fact that the proponent is the rightful lessee of the mine should be given.
- (iv) 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 and mining technology and should be in the name of the lessee.
- (v) 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.
- (vi) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary and national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated.
- (vii) Land use plan of the mine lease area should be prepared to encompass pre-operational, operational and post operational phases and submitted.
- (viii) Details of the land for OB dump 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.
- (ix) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Tiger/Elephant Reserves (existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated. A location map duly authenticated by Chief Wildlife Warden should be provided in this regard. Necessary clearance, if any, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above should be obtained from the State Wildlife Department/ Chief Wildlife Warden under the Wildlife (Protection) Act, 1972 and copy furnished.
- (x) A detailed biological study for 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, duly authenticated, separately for core and buffer zone should be furnished based on 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 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.
- (xi) Impact of change of land use should be given.
- (xii) R&R plan / compensation details for the project affected people. While preparing the R&R plan, the National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs / STs and other weaker sections, need based sample survey, family-wise, should be undertaken to assess their requirement and action programmes integrating the sectoral programme of line departments of the State Government.
- (xiii) The ore should be tested for heavy metals including uranium and results

- provided.
- (xiv) One season (non-monsoon) primary baseline data on ambient air quality (PM₁₀, PM_{2.5}, SO₂ and NO_x), water quality, noise level, soil and flora and fauna shall be collected and the AAQ data so collected 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 justified. Date wise collected baseline AAQ data should form part of EIA and EMP report. 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 and PM_{2.5} particularly for free silica should be given.
- (xv) 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.
- (xvi) The water requirement for the project, its availability and source to be furnished. A detailed water balance should also be provided. Fresh water requirement for the project should also be indicated.
- (xvii) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the project should be provided.
- (xviii) Details of water conservation measures proposed to be adopted in the project should be given.
- (xix) 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.
- (xx) 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. 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.
- (xxi) Details of first order stream, if any passing through lease area and modification/ diversion proposed, if any and the impact of the same on the hydrology should be brought out.
- (xxii) Details of rainwater harvesting proposed, if any, in the project to be provided.
- (xxiii) Information on site elevation, working depth, groundwater table should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.
- (xxiv) Quantity of solid waste generation to be estimated and details for its disposal and management be provided. The quality, volumes and methodology planned for removal and utilisation (preferably concurrently) of top soil should be indicated. Details of backfilling proposed, if any, should also be given. It

may be clearly indicated that out of the total waste generated during the mine life, the quantity to be backfilled and the quantity to be disposed off in the form of external dump (number of dumps, their height, terraces etc.).

- (xxv) The reclamation plan, post mine land use and progressive greenbelt development plan shall be prepared in tabular form (prescribed format) and submitted.
- (xxvi) 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 increased load. Arrangement for improving the infrastructure, if contemplated including action to be taken by other agencies such as State Government, if any, should be covered.
- (xxvii) Details of the infrastructure facilities to be provided for the mine workers should be furnished.
- (xxviii) Conceptual post mine land use and Reclamation and Rehabilitation of mined out area (with plans and with adequate number of sections).
- (xxix) Phase-wise plan of greenbelt development, 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.
- (xxx) Health history of workers should be provided. It should also include those who have left the company and the reasons for leaving the company i.e. health problems or otherwise.
- (xxxi) Occupational health impact of project should be anticipated and prevention measures initiated. Details in this regard should be provided.
- (xxxii) Occupational health impact of the project. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP.
- (xxxiii) Measures of socio economic significance influence to the local community proposed to be provided by project proponent. As far as possible, quantitative dimension may be given with time frame for implementation.
- (xxxiv) Detailed environmental management plan to mitigate the environmental impacts which, should inter-alia also include the impact due to change of land use, due to loss of agricultural land and grazing land, if any, occupational health impacts including that due to lead poisoning, if any, besides other impacts of the projects.
- (xxxv) Public hearing points raised and commitment of the project proponent on the same along with time bound action plan to implement the same.
- (xxxvi) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the project should be furnished.
- (xxxvii) The cost of the project (capital cost and recurring cost) as well as the cost towards implementation of EMP should clearly be spelt out.

4. Besides the above, the below mentioned general points will also be followed:-

1305

- a) All documents to be properly referenced with index, page numbers and continuous page numbering.
- b) Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.
- c) Where the documents provided are in a language other than English, an English translation should be provided.
- d) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.
- e) Approved mine plan along with copy of the approval letter for the proposed capacity should also be submitted.
- f) While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF 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.

5. 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.

6. The prescribed TORs would be valid for a period of two years for submission of the EIA/EMP reports, as per the O.M. No. J-11013/41/2006-IA.II(I) dated 22.3.2010.

7. After preparing the draft EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above mentioned issues, the proponent will get the public hearing conducted and take further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.

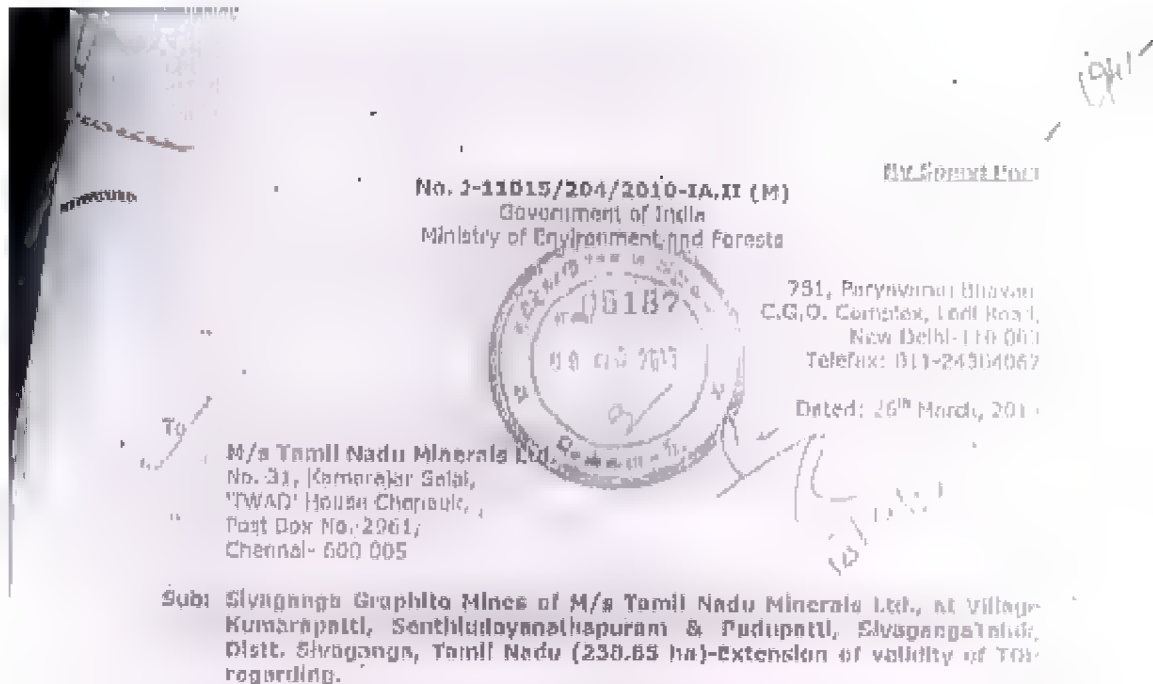

(Dr. S.K. Aggarwal)
Director

Copy to:-

1. The Secretary (Environment & Forests), Government of Tamil Nadu, St. George Fort, Chennai - 600 009, Tamil Nadu.
2. The Chairman, Tamil Nadu Pollution Control Board, 76, Mount Salai, Guindy, Chennai- 600 032, Tamil Nadu for necessary action.
3. The Chief Conservator of Forests, Southern Regional Office, Ministry of Environment & Forests, Kendriya Sadan, 4th Floor, E&F Wings, 17th Main Road, Block, Koramangla, Bangalore- 560 034, Karnataka.
4. Guard file.

(Dr. S.K. Aggarwal)
Director

Annexure – 6

Extension of Validity of TOR Issued in vide letter No. J.11015 /204/2010 – IA.II(M)**Dated 19th August 2010**

This has reference to your letter no. 11595/MU/2006, dated 26.09.2012. The Proposal is to extension of validity of the Terms of Reference (TOR) for undertaking detailed EIA study for the purpose of obtaining environmental clearance in accordance with the provisions of the EIA Notification, 2006.

2. The Ministry of Environment and Forests has issued TOR to M/s Tamil Nadu Minerals Ltd. vide letter of even no. dated 19th August, 2010. The proposal was considered by the (Reconstituted Expert Appraisal Committee in its 4th meeting held during 20th-22th February, 2013. The validity period of TOR prescribed for this Project is getting expired on 14.08.2012. It is mentioned that the Proponent prepared EIA/EMP and submitted to State Pollution Control Board for conducting Public Hearing.

3. Based on the request, the Committee recommended the extension of the validity of TOR for one year from the due date of expiry of its two year validity i.e. from 19th August 2012 to 18th August, 2013.

(Dr. S. Jagan)
Secretary

Copy to:

- 1). The Secretary, Ministry of Mines, Government of India Shriest Bhawan, New Delhi.
- 2). The Secretary, Department of Environment, Government of Tamil Nadu, Chennai.

Page 1 of 1

- The Secretary, Department of Forests, Government of Tamilnadu, Chennai
- 4). The Secretary, Department of Mines and Geology, Government of Tamilnadu, Chennai
 - 5). Chief Conservator of Forests, Regional Office (SZ), Kendriya Sadan, 4th Floor E&F, Wings 17th Main Road, 1 Block, Kormangala, Bangalore-560 034.
 - 6). Chairman, Central Pollution Control Board, Parkview Bhawan, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.
 - 7). The Chairman, Tamil Nadu Pollution Control Board, 70, Mount Salai, Guindy, Chennai- 600 032, Tamil Nadu.
 - 8). Member Secretary, Central Ground Water Authority, A2, W-3 Curzon Road Barracks, K.G. Marg, New Delhi-110001.
 - 9). Controller General, Indian Bureau of Mines, Indira Bhawan, Civil Lines, Nagpur-440 001.
 - 10). District Collector, Sivaganga District, Government of Andhra Pradesh.
 - 11). Guard File

(Dr. Sanoj)
Director