EXECUTIVE SUMMARY

1 PROJECT DESCRIPTION

1.1 INTRODUCTION

M/s.Karnataka Mining Industries is a partnership firm involved in mining, beneficiation & marketing of minerals. The applicant is having other mining leases in H.D.Kote taluk, for Kyanite and Graphite mineral mining. The partners of the firm Mr Naresh Bajaj & Mr Arun Kumar Bajaj are well experienced in the mining of Kyanite & Graphite.

M/s Karnataka mining industries is in possession of a Mining Lease No-2341 over a total extent of 150 acres (60.70 Hectares) in Hunaganahalli village.

The earlier lease was granted and executed for an area over 62 acres, further vide notification number_DGM/MLS/86/AML94/2004-05-9846/ML No 2341 Dtd: 20-10-2004 another area of 88 acres and inclusion of kyanite was granted coterminous to the existing lease No.2341 to M/s Karnataka Mining Industries.

Since the lessee has proposed to significantly increase the production of Kyanite to 10,000 tonnes/annum from 1000 tonnes, he has been advised to obtain Environmental clearance from MoEF, Government of India as per the above notification under EIA Notification dated 14th September 2006. The proposed increase in production has necessitated changing of the earlier Mining Plan. Hence, the modified Mining Plan is being submitted for approval and onward submission to MoEF and the Directorate of Mines and Geology. The Mining Plan is being prepared under Rule 22 of MCR 1960 for Kyanite and Graphite

1.2 OBJECTIVE OF THE PROJECT

To obtain environmental clearance for proposed project of Kyanite and Graphite Ore of Karnataka Mining Industries (Lease area 60.7 ha (150 Acre), proposed rate of production 10000 tonnes/ year).

Since the area within the lease is less fertile agriculture land because of deposition of the float mineral kyanite bearing graphite schist, maximum upto the depth of 1.2 m. Moreover, the process shall be development of the agriculture land by segregating al the float ore just converting the same to higher fertile land, therefore, this is not exactly a mining project as it doenot involve deployment of heavy mining machinery, drilling or blasting. This is surfacial because of collection of float ore from the surface and maximum up to the depth of 1.2 meters. Presently the land has low fertility due to the presence of the ore but it becomes 100% fertile just after collection of the ore. The area after the collection of mineral is immediately given back to the farmers for farming.

So, this mine is 100% environment friendly and it also increases the fertility of the land, so this project also helps in the land development.

1.3 FEATURE OF THE PROJECT:

- This is an **environment friendly** project.
- The land on which this project is proposed is low fertile land. The cultivation of cotton is done but the **yield is very low**.
- Presently most of the Patta land have low fertility due to deposit of float ore the yield for agriculture is very low after collection of float ore land becomes fertile and farmers are able to grow premium crops such as cotton, reggi etc.
- This project is basically the collection of float ore from the surface or at a maximum depth of 1.2 meters. So, this project cannot exactly be called as mining.
- The method of collection of the float ore is completely manual without involving any drilling or blasting.
- The collection of the done in patches i.e. the land from the farmers is taken for the ore for a small period and after collection of ore it is given back to the farmers for farming and after collection of ore the land becomes completely fertile.
- The growth of cotton is 250 to 300 kg/acre, when the mineral is present but as soon as the mineral is collected the growth becomes just double i.e. around 600 to 650 kg/acre.

- During this process of ore collection the farmers will be given employment in this project.
- In other words this **project also helps in land development.**

2 PROJECT DESCRIPTION WITH LOCATION

- The Project is located at Village Hunaganahalli, Tehsil H.D. Kote & Distt. Mysore, Karnataka.
- The area falls under survey of India GT Sheet 57 D/8 between latitude 12^{o}03'-12^{o}04' N and longitudes 76^{o}25'-76^{o}26' E.
- The Project Lease area **60.70 ha (150 Acre)** falls on Khasra Nos (patta nas) Sl. Nos.19.24, 25, 27, 28, 29,30, 31, 37 42, 43, 44, 45, 46, 47, 48, 49, 50, 51,52

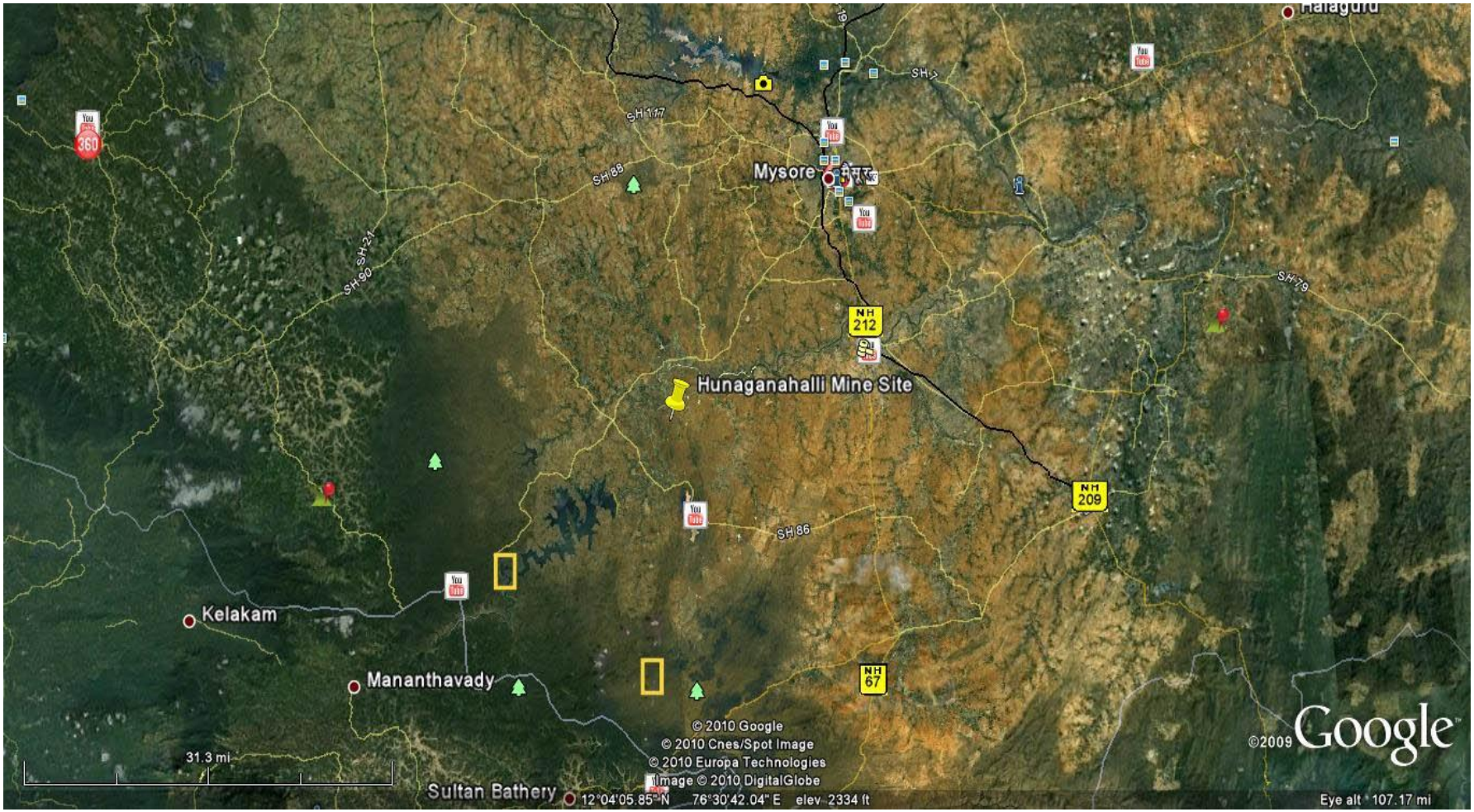

Figure 1: Google Image

Table- 1: General Information

S. No.	Particulars	Details
1.	Name of the project	"Graphite & Kyanite Mine (86 AML 94)" over an extent of 60.7 ha (150.00 Acres)
2.	Total Lease Area	60.7 ha (150.00 Acres)
3.	Locations	Near village Hunaganahalli, Tehsil Heggadadevanakote, Distt - Mysore, Karnataka
	A. Village	Hunaganahalli
	B. Taluka	Heggadadevanakote
	C. District	Mysore
	D. State	Karnataka
4.	Nearest Railway Station	Mysore Rly. Station 36 km (approx.)
5.	Nearest Airport	Bengaluru International Airport - 166 km (approx.)
6.	Nearest Water Body	Kabini River, which is approx. 5 km from the project site.
7.	Nearest Town	Mysore
8.	Reserve forest/Protected forest/ Wildlife Sanctuary/ Biosphere reserve.	No Reserve Forest/Protected Forest/Wildlife Sanctuary/Biosphere Reserve within 10 km
9.	Defense Installation	Not applicable
10.	Seismic Zone	Zone II

3 PHYSIOGRAPHY

The area forms an undulating terrain surrounded by "U" shaped ridges rising to a maximum height of 941 m above MSL. Applied mining lease area lies on the eastern slope of the hill ridge extending along N-S direction in Hunaganahalli village. Towards the east is the hill with moderately high relief. Hill tops are occupied by exposures of Kyanite and graphite bearing schist. The entire area is sloping towards east and there are a few seasonal streamlets (nallas) draining towards east, ultimately joining the river Kapila, at a distance of 5 km. The valley is occupied by dry agriculture lands where mostly rain fed crops are grown as the rainfall is scanty.

4 GEOLOGY OF THE AREA

The rock formations occurring in the area are high-grade metamorphic rocks classified under Sargur Schist Complex which are considered to be the oldest rock formation of Dharwar Craton of Karnataka. The region is composed of garnetiferous gneiss which is also known as tonalite with lenticular bodies of Amphibolites, Hornblende granulites, pyroxene granulites, meta-dunite and peridotite, garnetiferous mica schist and graphite-Kyanite-sillimanite-muscovite schists. In general these rock units are folded into isoclinal folds with well developed foliation with varying trends from N-S to NNW-SSE and dips are steep both to east and west.

LOCAL GEOLOGY: Total area is covered by Graphite and Kyanite bearing float ore. In the area both Graphite and Kyanite occurs as associated minerals and they are generated from the parent garnetiferous gneissic rock having lenticular patches of Graphite-Kyanite bearing schist located on the ridge to the west of the area. The, general trend of the gneiss is N10° W to S10° E and dips to 70° to 80° SW'. The floats of varying sizes are mixed with soil and deposited with varying thickness all along the slopes, Concentration and thickness of the float zone is better on higher slopes closer to the outcrops and as we move down slope both thickness and concentration of float ore reduces.

Graphite & Kyanite are found as associated minerals in the form of float material comprising flakes, crystals and fragments. The content of graphite mineral in the host rock varies to 2 to 5% and Kyanite analyses about 30 – 35% SiO_2, and 50-54% Al2O3 and 1.5-2.5 Fe_2O_3. The floats are mixed with soil and thickness of the float zone is about 1.2m on the higher slope and in lower fields it is about 0.8 to 1 m.

5 DRAINAGE PATTERN

The total area is sloping towards east and there are few seasonal nallas running towards east and joins the river Kapila which is at a distance of 5 km.

6 LAND USE PATTERN:

Table- 2 : Proposed Land Use

Already mined float ore area	1.13 Hectares
Mining	44.45 Hectares
Ore stock yard, rest yard + cap	6.17 Hectares
Infrastructure (Site services)	0.18 Hectares
Proposed afforestation	3.34 Hectares
Roads	5.43 Hectares
Total	**60.70 Hectares or 150 Acres**

7 DETAILS OF EXPLORATION

Exploration in the vicinity of the applied area has been carried out by the department of Mines and Geology, Government of Karnataka. About 8-10 trial pits of various dimensions were sunk all along the strike of the mineralized zone on the top of the ridge on the exposures of kyanite & graphite bearing schist. Though there is no insitu Graphite-Kyanite deposit in the applied area, the exploration done in the past by the DMG in the hills adjoining the ML points to the existence of primary source for the Graphite - Kyanite float.

Based on the geological mapping, applicant has dug 26 trial pits in the existing mining lease nos.2341 and 2340, and proved the existence of graphite - kyanite float zone. Since the area is agricultural land extensive pitting could not be carried out. Pitting and fresh float collection in two areas has revealed that the float ore occurs up to a depth of 1.2m thickness. In Block- 1 thickness of the float zone is about 1.2 m with about 32% concentration and in Block- 2 thickness is about 0.80 m with 12% concentration of float ore. In Blocks 3 and 4 the thickness of the float horizon is 1.0m and 0.8m respectively with concentrations of 18% and 12%. The average Bulk density derived for the float ore is 2.5.

8 METHOD OF ESTIMATION OF RESERVES

Since the deposit is float ore type and of shallow depth trial prospecting pits dug by the lessee and the results obtained form the basis for estimation of proved reserves. Four blocks have been demarcated and the surface area of each of these block calculated. By taking the average thickness of the ore zone and recovery percentage, the ore reserves have been estimated. The following parameters were taken into consideration to estimate the reserves.

- Aerial extent of the Graphite and Kyanite float in the 4 blocks
- Thickness of the float ore horizon
- Recovery of the Kyanite-graphite float 0.8m to 1.2m
- Tonnage conversion factor (Bulk density) – 2.5

Geological reserves of Graphite & Kyanite Float ore

The Kyanite-Graphite float ore forms a layer of uneven thickness on the slopes of the area. The fragments of Graphite-Kyanite schist and quartzo-feldspathic material are mixed up in the area on lower slopes of the mound. Thickness of the float ranges from 0.8 to 1.2 metres.

Table- 3 : Details of Reserve Calculation

Block No.	Surface area (length X width)	Av. Float Depth	Bulk Density	Tonnes of mined Ore	Kyanite % recovery	Tons of Ore Recovered
1	28,145 sq m,	1.2 m	2.5	84,435	32%	27,019 tonnes
2	200,000 sq m.	0.8 m	2.5	400,000	12%	48,000 tonnes
3	118,000 sq m	1.0 m	2.5	53,100	18%	53,100 tonnes
4	96,680 sq m.	0.8 m	2.5	23,203	12%	23,203 tonnes
			Total Probable Reserves --			**151,323 Tonnes**

Total probable reserves available in area is **1, 51,323 tonnes** and categorized as (121+122) under UNFC code classification.

9 LIFE OF THE MINE

Since no mine development is involved, the proposed collection of float ore in full measure i.e. 10,000 TPA will begin from the 1st year itself. At the proposed rate of production of about 1000 tonnes per year and the proved reserves, anticipated life of the mine is about 15 years.

10 MINING

FLOAT ORE COLLECTION: Since the deposit is of float type and maximum depth of the horizon is only 1.2m, it is proposed to carry out manual float collection using simple tools like crow bar, pick axe, iron pan and sieve etc. The ore produced will be transported by tractor trailer and stocked in the stock yard which will be picked up by trucks and transported to the processing unit at Bangalore.

The float ore horizon will be initially loosened by using crow bar and material will be screened through sieving at site. All soil and finer rock fragments get separated from kyanite fragments.

Practically there is no waste generation. All the soil and finer material shall be put back into site and the land levelled for further agricultural use. Production of float ore will be at the rate of 10,000 tonnes per annum.

Small area shall be within operation for purpose of collection of float ore. The land shall be reclaimed for agriculture purpose immediately after collection of ore is completed.

11 BACK FILLING BY SOLID WASTE

Practically there is no waste generation. All the soil and finer material shall be put back into site and the land levelled for further agricultural use.

12 PRODUCTION DETAILS

Collection of float ore is proposed at the rate of 10,000 tonnes per annum. The float ore collection is proposed to be commenced from Block 1 on the western side of the ML

area where about 32% recoverable concentration of Kyanite-Graphite float is found. The proposed production programme is given bellow:

Table- 4 : Details of Production

Year	Production Tonnes	Soil will be put back into the land
I year	10,000	-- do --
II year	10,000	-- do --
III year	10,000	-- do --
IV year	10,000	-- do --
V year	10,000	-- do --
Total	50, 000	-- do --

13 CONCEPTUAL MINING PLAN:

The mining depth will be only up to a max depth of 1.2 m. During first five year plan period working will be in Block 1 as shown in plate 6. It is proposed to produce 10,000 tonnes of float Kyanite and Graphite ore every year. It is proposed to put back the soil simultaneously with float ore collection and level the area after recovery of the float Kyanite-Graphite ore which would make the land much more fertile and agriculture friendly.

During the conceptual mine plan period more trial pits and trenches will be opened in the area to get more information about the recovery and concentration of float ore. It is also proposed to develop a green belt along the lease boundary. During the conceptual period 0.5 Ha green belts will be developed for every five years.

14 EMPLOYMENT POTENTIAL

In order to achieve the production target and to comply with all the statutory requirements following mining personals shall be deployed from the adjoining mines of the applicant. Since these are adjoining areas same technical crew can supervise and guide the mining activities.

Mining Engineer, Geologist, Mine mate cum supervisor, Driver and about 50 workers will be engaged for loosening the soil, screening and sorting of kyanite-graphite fragments from the float-soil zone.

15 PRESENT ENVIRONMENTAL SCENARIO

The baseline data for meteorology, air, noise, water and soil were collected during the month of March to May, 2010. The air at 6 stations and noise monitoring was done at 10 stations, soil and water at 8 locations. The brief details are given below:

Table- 5 : Details of Production

S. No.	Parameters	Values
1.	**Temperature**	
	Max.	39.4°C
	Min.	10.6 ^{0}C
2.	Relative Humidity	70 % – 40 %
3.	Average Rainfall	1000 - 1500 mm/annum
	Ambient Air Quality	
4.	PM10	70.8 μg/m^3
5.	SO_2	<0.1μg/m^3
6.	NOx	<0.1μg/m^3
	Noise level	
7.	Day time	47.7 dB
8.	Night time	42.0 dB
9.	**Water quality**	
	pH	7.35 to 8.96
10.	TDS	104 to 2090 mg/L
11.	Nitrates	0.39 to 34.5 mg/L
12.	Fluoride	<0.02 to 0.84 mg/L
13.	**Soil analysis**	
	pH	5.99 to 8.28
14.	Organic matter	5.5 to 9.0%

16 ENVIRONMENT IMPACT ASSESSMENT

16.1 AIR, WATER, NOISE, VIBRATION LEVEL:

There will be no impact on all these parameters of environment as not only the scale of operation is small being 30 tonnes per day and the method involves collection of float ore manually.

16.2 SOCIO-ECONOMIC ENVIRONMENT:

There are a few villages situated within the 5 km radius of the area with population of about 12,000. Presently they are all engaged in seasonal agricultural activity. The mining activity will generate some permanent employment to the local populace. Recovering

the graphite-Kyanite float ore from top layers of the agricultural field is expected to increase its fertility resulting in increased production of crops.

17 ENVIRONMENT MANAGEMENT PLAN

17.1 LAND ENVIRONMENT

- The lease area is covered by private dry rain dependent agriculture land.
- Presently, the land is non fertile due to the presence of the mineral but it becomes fertile just after the collection of the mineral.
- The land is immediately after collection of ore is given back to the farmers.
- Because of the float ore mining there will little change in the landscape of the area. At the conceptual stage the mined out area will be backfilled to make the land for agriculture.
- It is proposed to develop a belt of about 7.5 mt of green belt all along the boundary of the area. Every year it is proposed to carry out afforestation over 0.1 hects by planting 200 saplings of local varieties plants which may survive better.

17.2 QUALITY OF AIR, NOISE LEVEL AND SOIL:

There will not be any effect on the quality of air and water as the mining is on small scale and confined to the soil horizon upto a maximum depth of just over a metre. No blasting is proposed and also no heavy machineries will be utilized for this mining, hence impact on noise level is nil. Soil cover will be retained and reclaimed for agriculture purpose.

17.2.1 Air Environment

The source of air pollution in the region to mining and the related transportation activities. The meteorology of the area becomes an important parameter in the environmental issues in the mining settlements. The dust generated from the mine haul

roads and overburden dumping sites will contribute to environmental pollution unless checked.

Suitable precautionary measures by water spraying on haul roads and by afforestation to protect the inhabitants and environment will be taken. Considering the quantum of work i.e. manual system of working all environmental parameters will remain within the limits.

17.2.2 NOISE ENVIRONMENT

There will not be much impact on noise environment by this small scale open cast float mining. The method of collection of ore will be simple manual collection or picking of float. There shall not be any kind of utilization of heavy earth moving machinery and drilling or blasting.

17.3 WATER MANAGEMENT:

There are no perennial water courses or nalas (streamlets) in the mining area. The proposed method of mining will not have any impact on the ground water regime. In fact, it will enhance the ground water recharge. However, seasonal nalas will not be disturbed by this mining and if needed small-check dams will be constructed to check the surface runoff and control the siltation.

17.4 SOLID WASTE MANAGEMENT

After recovery of the float ore, the remaining non mineralized pebbles will be kept separately for possible future use for road metal and soil and silt will be backfilled in the worked out area and will be levelled so that area can be used for agriculture. Practically there is no waste left behind and the agriculturist will be benefitted by this mining activity. So no proposal of disposal of waste and no site is located for disposal of waste other than reclamation of the mined out area.

17.5 FLORA AND FAUNA:

The applied area is an agriculture land and it is devoid of vegetation except a few small trees at the corners of the private lands. Very rare fowls, crow, fox, wild pigs have been spotted occasionally on the hillocks by villagers.

18 HUMAN SETTLEMENT:

There are no human settlements in the ML area. Village Hunaganahalli is adjoining to the area in the north direction. The total population in villages falling in the buffer zone is 12,166.

19 STORAGE AND PRESERVATION OF TOP SOIL:

The top soil of 1 to 1.2 m thickness is upgrade in the proposed method of mining, wherein the deleterious rock fragments and rubbles are removed from top soil by sieving. No separate storage of top soil is necessary during the mining to collect the float ore.

The top soil, after recovering the kyanite-graphite float is restored in the same place so as to make the land much more fit for agricultural use, with increased fertility. There is no need for separate soil storage.

Reclamation work will be carried out continuously and simultaneously after the mineral is depleted as per the conceptual mining plan; it is propose to refill and level area for agricultural use.

Small area of 1 or 2 acre shall be within operation for the purpose of collection of float ore. The land shall be reclaimed for agriculture purpose immediately after collection of ore is completed and given back to the farmers for agriculture.

20 AFFORESTATION PROGRAMME:

It is proposed to develop a belt of about 7.5 m of green belt all along the boundary of the area. For First five years an average 200 sapling will be planted in about 3.34 Ha land. Details of proposed plantation are as follows.

Table- 6 : Plantation Details

Year	Location	No. of Saplings	Boundary
I Year	E 195 - E 284	200	Western Boundary
II Year	E 95 ~ E 195·	200	Western Boundary
III Year	N 625 -_N 705	200	Western Boundary
IV Year	N 515 - N 625	200	Western Boundary
V Year	N 390 - N 515	200	Western Boundary

21 COST OF ENVIRONMENT PROTECTION MEASURES

There is no question of rehabilitation in the proposed method of mining. However the lessee will spend the following amounts for afforestation.

Table- 7 : Environment Management Cost

S.No.	Activity	Details of Jobs	Capital Cost (Lakhs)	Recurring cost / Annum (Lakhs)
01	Afforestation works	200 saplings	0.75	0.50
02	Dust Control	25 tractor trips of water & Suppression	2.00	0.75
03	Check dams etc.	10 mts	1.00	0.50
04	Environmental monitoring		1.00	0.50
Total Estimate			**4.75**	**2.25**