

EXECUTIVE SUMMARY

PURPOSE OF THE REPORT

Environmental Impact Assessment (EIA) is a decision making tool, in the hands of the Authorities which brings forth the factual position about a project that enables them in arriving at an appropriate conclusion for the proposed projects, to retain them if environmentally sound, and reject if found having deleterious overall impact. EIA identifies the extent of the environmental, social and economic impacts of a project prior to decision-making. EIA systematically examines both beneficial and adverse impacts of the proposed project over and above the prevailing conditions of environmental parameters and ensure that these impacts are taken into account during the project designing stage itself and the values of the combined impacts are never allowed to exceed and remain within the statutory norms. This process has been envisioned and set in motion by the Ministry of Environment and Forests for sustainable development and the final decision is arrived at only, when those to whom it matters are made known of the salient features of the project being envisaged close to them and their opinion has been sought in a widely advertised Public Hearing Event under the chairmanship of the district authorities so that public could also express their opinion free, without favour and fear. Environmental Impact Assessment report is prepared to comply with the Terms of Reference (TOR) received from SEIAA, Uttarakhand, under EIA Notification of the MoEF dated 19-8-2006, and its subsequent amendments and EIA Guidance Manual for Mining of Minerals of MoEF, Govt. of India, for seeking environmental clearance for mining of soapstone in the applied mining lease area measuring 4.982 Ha. The proposed project falls under Category “B2” as per EIA Notification 2006 its amendment 2009, 2011, 2012 & 2016 of the Ministry of Environment and Forests, New Delhi but due to NGT recent order it falls under B1 Category.

IDENTIFICATION OF PROJECT & PROJECT PROPONENT

The proposed project of Shri Govind Singh Bhauriyal is for soapstone which covers an area of 4.982 Ha near Village – Dayali Kuroli, Tehsil-Dugnakuri, District- Bageshwar, State-Uttarakhand. LOI has been granted in favour of Shri Govind Singh Bhauriyal S/o. Khushal Singh Bhauriyal vide Letter No. 1831/VII-1/2017/18-Soapstone/17 dated 20.12.2017, attached as Annexure I.

Soapstone finds its uses in all aspects of life and commercial business. Soapstone has wide applications across various industries. Some uses for soapstone or talc are paper, textile, cosmetics, paint, ceramics, detergents, animal feed, insecticide, plastics and various drying powder. Soapstone, also known as Talc or Talcum Powder, is a mineral that is naturally found in nature. The chemical name for Talc or Talcum Powder is hydrated magnesium silicate. The

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region Uttarakhand accounts for 29% of India's soapstone production.

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The highest production is 15000 Tonnes/ Annum.

S.No.	Year	Production (Tonnes)
1.	1 st Year	15000
2.	2 nd Year	15000
3.	3 rd Year	15000
4.	4 th Year	15000
5.	5 th Year	15000
Total		75000

The proposed mining project has been categorized as Category B2 project.

Proponent & Address

Shri Govind Singh Bhauriyal

Village – Dayali Kuroli, P.O. - Saneti

Tehsil– Dugnakuri, Distt. Bageshwar, Uttarakhand.

BRIEF DESCRIPTION OF NATURE, SIZE AND LOCATION OF THE PROJECT

Brief details of the project are described in the Table below:

Details of the Project

S. No.	Particulars	Description
A	Mining Lease & Location Details	
1.	Name of the Project	Shri Govind Singh Bhauriyal Soapstone Mine Project
2.	Location	
a.	Village	Dayali Kuroli
b.	Tehsil	Dugnakuri
c.	District	Bageshwar
d.	State	Uttarakhand
3.	Lease Area Coordinate	Latitude : 29° 54' 34.98" to 29° 54' 49.73" N Longitude : 79° 58' 8.37" to 79° 58' 18.12" E
4.	Lease Period of Mine	25 Years
5.	Cost of the project	Rs. 32 Lac
6.	Man Power Requirement	55 Nos.
7.	Water Requirement & Source	9.57 KLD approx. for Drinking & Dust

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		Suppression / Plantation & Source: Nearby villages & natural springs.
B	Environmental Settings	
8.	Elevation(RL)	Highest & lowest levels found in the area are of RL 1910m and 1852.9m RL respectively.
9.	Nearest National Highway /State Highway	SH- 37: Balighat-Dharmagarh road; 1 Km SW
10.	Nearest Railway Station	Kathgodam; 82 Km SW (Aerial)
11.	Nearest Airport	Pantnagar; 109 Km SW (Aerial)
12.	Ecological Sensitive Areas(Wildlife Sanctuaries)	Zim Corbett National Park; 97 km SW(Aerial)
13.	Reserved/Projected Forests	Zim Corbett National Park; 97 km SW(Aerial)
14.	Nearest Town/City	Village: Kuroli– 1.0 Km Town: Bageshwar – 45 Km
15.	Nearest River	Saryu River – 1.90 Km NNW
16.	Seismic Zone	Zone – V

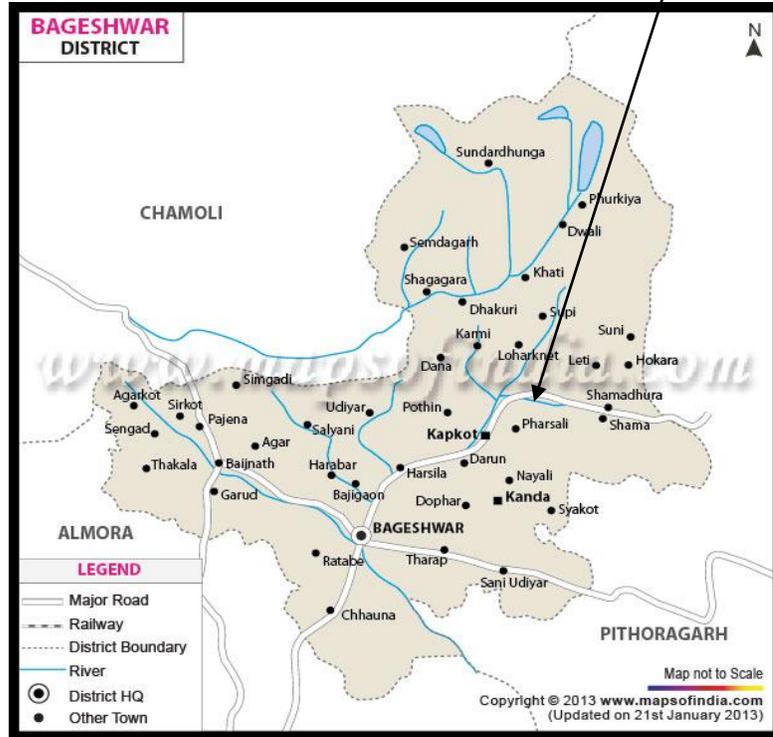
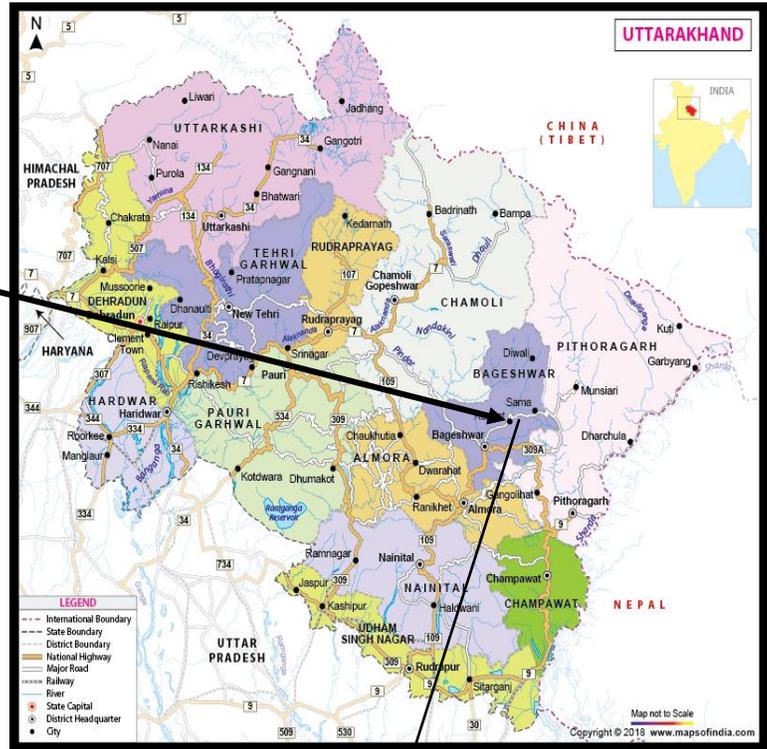


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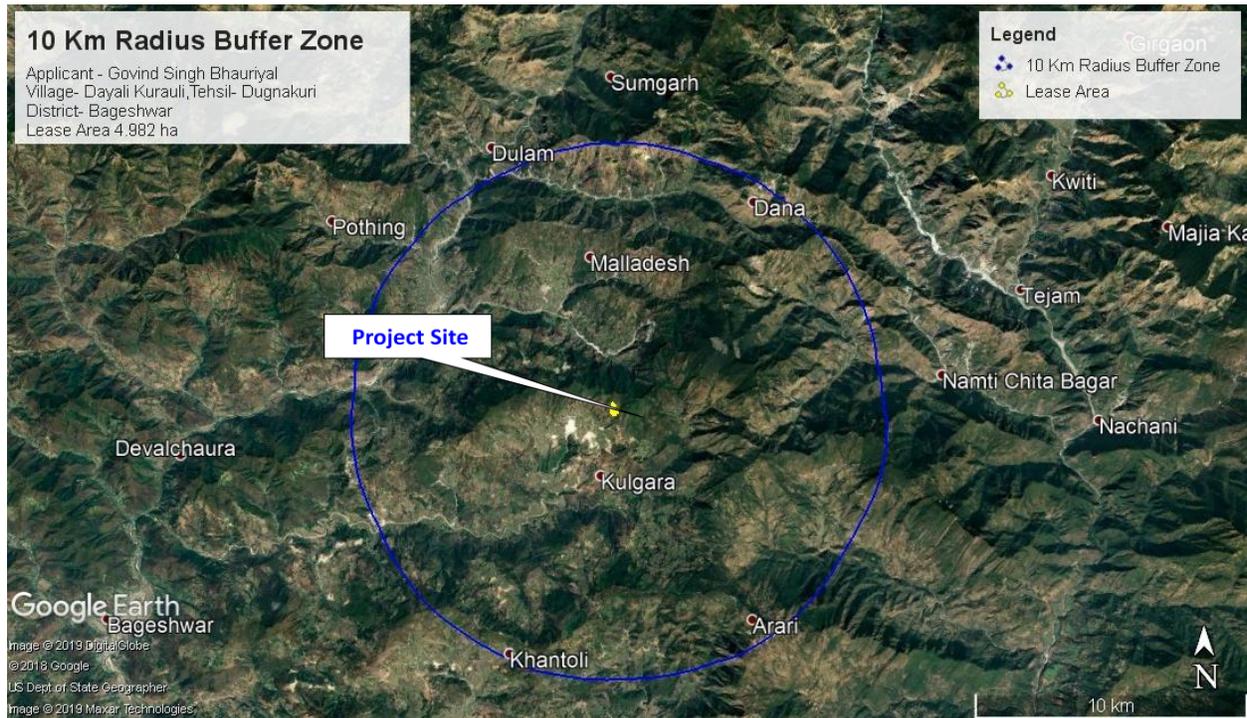
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Project Location



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10 KM Study area

STATUS OF REGULATORY CLEARANCES OF THE PROJECT

The Mining plan has been approved by DGMU vide Letter No. 3061Mukhya Khanij/M.PLAN.-119/BHU.KHANI.E/2017-18 dated 12.03.2018.

There is no National Park, Wildlife Sanctuary & National Monument, within core zone or 10 km radius of the ML area.

There is no legal issue against the project in the court of law.

MINE DEVELOPMENT AND PRODUCTION

The mining will be done semi-mechanized way in open cast method in quite a systematic manner by forming 6m high benches. However, there may be minor variation in the width and- height which the lessee will keep on mending. The top soil and interburden to be scrapped with the help of JCB machine, dozer, shovels, pickaxe, spade & crowbar and will be stacked separately in dump yard located near the working pit. The developmental working will be done by construction of road/track to different working benches, removal of top soil and interburden. The soil will be filled into the bags, loaded on mules and unload into stockyard.

Method of Mining

The mining will be carried out in three pits and will be open cast semi -mechanized method in quite a systematic manner by forming 3m height and 3m width benches . The face slope of benches shall be 60 ° – 65 ° with 45 ° overall pit slope. Average thickness of soil has been considered as 0.8m to 1.3m & it shall be stacked separately. All operations of mining will be carried by using JCB as well as conventional manual means using crowbars, spades and chisel etc as well as by using excavator. The production has been proposed in quarry of the ML area. No deep hole drilling and blasting is proposed.

IMPACT ON LAND USE & RECLAMATION OF MINED OUT AREAS

Opencast mining activities may alter the landscape of the lease area and also cause some disturbance to the surface features of the surrounding areas. Mining will be done after leaving 7.5 m safety barrier.

Plantation will be developed in consultation with district administration/ local authority, wherever feasible.

Proposal for reclamation of land affected by mining activities:

The mining will commence from the higher levels and will advance towards lower levels. Intermittent backfilling will commence from the higher levels and subsequently advance towards the lower elevation so that terraced agriculture fields would undertake in such a manner that original land use will be restored i.e. before the onset of monsoon will be handed over to cultivators for cultivation. The final backfilling will be started once the ultimate benches are formed and pit reaches the optimum economic depth. All recovery of the mineral will be of the saleable grade.

Plantation will be raised in 7.5m barrier zone along the boundaries of the mining lease area by planting the native species around ML area, backfilled and reclaimed area, around water body, roads etc. in consultation with the local DFO/Agriculture department.

LAND USE PATTERN

Presently (pre-mining), the land covered under the mine lease area is non-forest land.

BASELINE ENVIRONMENTAL STATUS

Soil Quality

Five soil samples were collected in and around the mine lease area to assess the present soil quality of the region. Physical characteristics of soil were characterized through specific parameters viz bulk density, porosity, water holding capacity, pH, electrical conductivity and texture. Soil pH plays an important role in the availability of nutrients. Soil microbial activity as well as solubility of metal ions is also dependent on pH. In the study area, variations in the pH of the soil were found to be slightly basic (7.42 to 7.69). Electrical conductivity (EC) is a measure of the soluble salts and ionic activity in the soil. In the collected soil samples the conductivity ranged from 268-431 $\mu\text{mhos/cm}$.

The soils with low bulk density have favorable physical condition where as those with high bulk density exhibit poor physical conditions for agriculture crops.

Based on the results, it is evident that the soils are not contaminated by any polluting sources.

Meteorology

Meteorological data at the site was monitored during 1st March 2019 to 31st May 2019 representing winter season.

Ambient Air Quality

Ambient Air Quality Monitoring (AAQM) has been carried out at five locations during pre-monsoon season from March to May 2019. The minimum and maximum level of PM10 recorded within the study area was in the range of 41.7.1 $\mu\text{g/m}^3$ to 62.8 $\mu\text{g/m}^3$ with the 98th percentile ranging between 58.2 $\mu\text{g/m}^3$ to 61.4 $\mu\text{g/m}^3$. The minimum and maximum level of PM2.5 recorded within the study area was in the range of 16.2 $\mu\text{g/m}^3$ to 28.2 $\mu\text{g/m}^3$ with the 98th percentile ranging between 23.2 $\mu\text{g/m}^3$ to 27.7 $\mu\text{g/m}^3$. The minimum and maximum concentration of SO2 recorded within the study area was 5.5 to 8.4 $\mu\text{g/m}^3$ with the 98th percentile ranging between 5.6 $\mu\text{g/m}^3$ to 7.1 $\mu\text{g/m}^3$. The minimum and maximum level of NO2 recorded within the study area was in the range of was 7.6 $\mu\text{g/m}^3$ to 17.3 $\mu\text{g/m}^3$ with the 98th percentile ranging between 12.0 $\mu\text{g/m}^3$ to 16.7 $\mu\text{g/m}^3$. The results thus obtained indicate that the concentrations of PM10, PM2.5, SO2 and NO2 in the Ambient Air are well within the National Ambient Air Quality (NAAQ) standards for Industrial, Residential, Rural and other areas.

Water Quality

The water quality in the impact zone was assessed through physico-chemical and Microbiological analysis of ground water samples. The results have been compared with the

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drinking water quality standards specified in IS: 10500. It was observed that all the physico-chemical parameters and heavy metals from ground water samples are below stipulated limits for drinking water standards.

□ The pH limit fixed for drinking water samples as per IS-10500 Standards is 6.5 to 8.5 beyond this range the water will affect the mucus membrane or water supply system. During the study period, the pH was varying for ground waters from 7.46 to 7.82 and the surface waters are 7.12 to 7.53. The pH values for all the samples collected in the study area during study period were found to be within the limits.

□ The desirable limit for total dissolved solids as per IS-10500 Standards is 500 mg/l whereas the permissible limits in absence of alternate source is 2000 mg/l, beyond this palatability decreases and may cause gastro intestinal irritation. In ground water samples collected from the study area, the total dissolved solids are varying from 243 mg/l to 275 mg/l. The TDS of the samples were above the desirable limit but within the permissible limit of 2000 mg/l.

□ The desirable limit for chlorides is 250 mg/l as per IS-10500 Standards whereas, permissible limit of the same is 1000 mg/l beyond this limit taste, corrosion and palatability are affected. The chloride level in the surface water samples collected in the study area were ranging from 8 mg/l to a maximum of 20 mg/l, in ground water samples 12 mg/l to 27 mg/l. The chloride samples are within the desirable limits.

□ The desirable limit as per IS-10500 Standards for hardness is 200 mg/l whereas the permissible limit for the same is 600 mg/l beyond this limit encrustation in water supply structure and adverse effects on domestic use will be observed. In the ground water samples collected from the study area, the hardness is varying from 149 mg/l to 214 mg/l.

□ Fluoride is the other important parameter, which has the desirable limit of 1 mg/l and permissible limit of 1.5 mg/l. however the optimum content of fluoride in the drinking water is 0.6 to 1.5 mg/l. If fluoride content is less than 0.6 mg/l it causes dental carries, above 1.5 mg/l causes flurosis. In the ground water samples of study area the fluoride value were in the range of 0.2 mg/l to 0.5 mg/l. In surface water 0.3 mg/l to 0.5 mg/l.

Overall all the samples collected from the study area were found to be fit for consumption, Most of ground water samples are well within the permissible limits, as per IS-10500. Most of the heavy metals in all samples are below detectable limits.

Noise Levels

The noise level monitoring results of March 19 to May 19. The ambient noise level in study area during the day time varies from 45.45 to 40.26 dB (A) during day time and 41.85 to 35.66 dB (A) during night which is within the specified limits of CPCB.

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Based on the field studies and review of published literature, it is observed that there are two Schedules-I species present in the study area of the mine lease area i.e. Indian Leopard and Asiatic Black Bear. There are no wildlife sanctuaries and National Parks within the study area of 10-km radius.

ANTICIPATED ENVIRONMENTAL IMPACTS

Impact on Air Quality

Soapstone mine where PM10 and PM2.5 will be the main pollutants generated in mining activities. The emissions of Sulphur dioxide (SO₂), Nitrogen Oxide (NO₂) contributed by diesel operated equipment and vehicles movement were considered marginal as branded make and vehicles with PUC certificate will be operated only. Fugitive dust and particulates are major pollutants occurred in the mining activities. Fugitive emissions will be settled by 70- 80% by use of multiple water sprinklers. Prediction of impacts on air environment will be made with proposed production and net increase in PM10 and PM2.5 emissions at the proposed site and at the 10 km radius of study area due to mining activities.

Air pollution sources in the operating mine was classified into two categories

- i. Loading and unloading of mineral and OB, IB
- ii. Transportation on the haul road

Impact on Water Resources Surface Water Resources

The topography of the area will not be largely changed in view of the proposed concurrent reclamation. During the mining activity period, there is a possibility of mixing of freshly disturbed material with the rain water. To take care of such happenings, retaining walls have been provided along the backfilled pits and along the soil and interburden dumps.

Groundwater Resources

The water table in hills is usually very deep and does not have any relevance with mining activities. However, concurrent restoration to original topography will not be disturbing the percolating water.

Impact on Water Quality

The impact on water quality will be confined to increased suspended solids during rain. The dumps will be secured with toe walls and rainy water will not carry significant suspended material.

With the mining operations, due to the deployment of machinery, operation for mine development, excavation and transportation of soapstone, it is imperative that noise levels would increase. It is also observed that these incremental noise levels will not significantly affect the existing ambient noise levels.

Impact on Soil

The environmental impacts of the mining activities on topsoil are based on the quantity of removal of topsoil and its dumping. In the present project as it is proposed to temporarily store the topsoil and use it for plantation schemes, no impact of dozing of topsoil is envisaged.

The soil erosion from overburden and interburden dumps is not envisaged in the present project, as sufficient measures as detailed in the EMP would be undertaken.

Impact on Flora and Fauna

There is no forest area in the core zone area of the lease. As the mining activity is restricted to core zone, no significant impact on the flora of the buffer zone due to the proposed mining of Soapstone is anticipated.

The incremental dust generations due to the mining operations, at the boundary of the mine lease are insignificant and it is also expected that with the adoption of mitigatory measures as suggested in EMP, the impact due to operation of the mine will be minimal on the terrestrial ecosystem and also on the adjacent forest area.

The impact on the fauna of the buffer zone due to the mining activity will be marginal. The proposed progressive plantation over a period of time will reduce the impact, if any, on the fauna.

Impact on Land Use Pattern

The proposed opencast mine will result in change the land use pattern of the ML area. The land degradation is expected during mining activities like excavation, overburden dumping, soil extraction etc. Land requirement for the project has been assessed considering functional needs.

Impact on Socio - Economic Aspects

The mine area does not cover any habitation. Hence the mining activity does not involve any displacement of human settlement. No public buildings, places, monuments etc exist within

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the lease area or in the vicinity. The mining operation will not disturb/ relocate any village or need resettlement. Thus no adverse impact is anticipated.

The impact of mining activity in the area is positive on the socio-economic environment of the region. The proposed Soapstone Mine will be providing employment to local population and it will be give preference to the local people whenever there is requirement of man power

ENVIRONMENTAL MANAGEMENT PLAN

The summary of environmental mitigation measures are given in below table:

Table: Proposed Environmental Mitigation Measures

Impact Predicted	Suggestive measure
Disturbance of free movement / living of wild fauna	Awareness camps will be conducted for labours to make them aware about sensitivity/importance of forest life.
	<ul style="list-style-type: none"> No tract or new road for movement of labours or vehicles be laid in reserve forest area, this will prevent forest fragmentation, encroachment and human – animal encounter.
	<ul style="list-style-type: none"> Care will be taken that noise produced during vehicles movement for carrying ore materials are within the permissible noise level. Higher noise level in the forest area will lead to restless and failure in detection of calls of mates and young ones.
	<ul style="list-style-type: none"> Care will be taken that no hunting of animals carried out by labours.
	<ul style="list-style-type: none"> If wild animals are noticed crossing the core zone, it will not be disturbed at all.
	<ul style="list-style-type: none"> Labours will not be allowed to discards food, plastic etc., which can attract animals near the core site.
	<ul style="list-style-type: none"> Only low polluting vehicle will be allowed for carrying ore materials. All vehicles allowed in the project site area will have to provide pollution under control certificate at the end of three months.
	<ul style="list-style-type: none"> No honk will be allowed in the forest area, noise level will be within permissible limit (silent zone-50dB will be within permissible limit (silent zone-50dB



	during day time) as per noise pollution (regulation and control), rules, 2000, CPCB norms.
Harvesting of forest flora	<ul style="list-style-type: none"> • No tree cutting, chopping, lumbering, uprooting of shrubs and herbs should be allowed. • No pilling of ore material should in the reserve forest area. • Collections of economically important plants will be fully restricted.

ANALYSIS OF ALTERNATIVES

The Soapstone has been identified based on the result of geological investigations and exploration carried out by the Geological Survey of India (GSI). The mining projects are site specific as such alternate sites were not considered.

The mine is operated by opencast cum semi-mechanized method of mining. No other alternative technologies can be used because of the hard nature of the ore. Proposed mine is using eco-friendly measures to minimize the impact of mining on the surrounding environment.

ENVIRONMENTAL MONITORING PROGRAM

Attributes	Sampling		Measurement Method	Test Procedure
	Network	Frequency		
A. Air Environment				
Meteorological	Minimum 1 site in the project impact area	Regularly in one season by Weather Monitoring Station	Mechanical/automatic weather station	-
Wind direction				
Relative humidity				
Rainfall	7 locations in the project impact area (Minimum 2 locations in upwind side, 2 sites in downwind side / impact	Once in a season.	Gravimetric method	-
Pollutants			Gravimetric method	-
PM ₁₀			EPA Modified West & Geake method	Absorption in Potassium Tetra Chloromercurate followed by Colorimetric estimation using P-Rosaniline
SO ₂				

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	zone and 1 in core zone)			hydrochloride and Formaldehyde (IS: 5182 Part - II).
NO ₂			Arsenite modified Jacob & Hochheiser	Absorption in dil. NaOH and then estimated colorimetrically with
				sulphanilamide and N (I-Nephthyle) Ethylene diamine Dihydrochloride and Hydrogen Peroxide (CPCB Method).

B. Water Environment

pH, Turbidity, Colour, Odour, Taste, TDS, Total Hardness, Calcium hardness, Magnesium hardness, Chloride, Fluoride, Sulphate, Nitrates, Alkalinity,	Set of grab samples during pre and post-monsoon for ground and surface Water in the vicinity.	Diurnal and Season wise	As per IS 10500	Samples for water quality should be collected and analyzed as per : IS : 2488 (Part 1-5) methods for sampling and testing of Industrial effluents
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Iron, Copper, Manganese, Mercury, Cadmium, Selenium, Arsenic, Cyanide, Lead, Zinc, Chromium, Aluminum, Boron,				Standard methods for examination of water and wastewater analysis published by American Public Health Association.
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C. Noise

Noise levels at Day & night time - Leq dB (A)	Mine Boundary, High noise generating areas within the lease	Quarterly / Half yearly	As per CPCB norms	As per CPCB norms
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D. Soil

pH, Bulk Density, Soil texture, Nitrogen, Available Phosphorus, Potassium, Calcium, Magnesium,	3 locations in the project impact area	Yearly/half yearly	As per USDA Method	As per USDA Method
Sodium, Electrical Conductivity, Organic Matter, Chloride				



E. Socioeconomic				
Demographic structure	Socioeconomic survey is based on proportionate, stratified and random sampling method	Minimum for two phases of the project	Primary data collection through Questionnaire	Secondary data From census records, statistical hard books, topo sheets, health Records and relevant official records available with Govt. agencies
Infrastructure resource base				
Economic resource base				
Health status: Morbidity pattern				
Cultural and Aesthetic attributes				
Education				

COST ESTIMATES

The details of the cost to for the Environmental Management plan for 5 years, the budget for Corporate Environmental Responsibility (CER) (per year) and year wise allocation of funds for the various activities proposed to be taken up under CSR programme has been given in below Table.

S. No.	Activities	Allocation of Fund (Rs. Lacs)
1	Health Camps	1.0
2	Up gradation of toilets of government school in nearby villages	1.5
3	Distribution of Books and Notebooks among meritorious girl child belonging to Scheduled Caste and Scheduled Tribe population.	0.2
4	Repair and Painting of School Building in the project village	0.5
	Total	3.2

Budget for Environmental protection

S.No.	Measures	Capital Cost (In Rs.) (1 st Year)	Recurring Cost (In Rs.) (for Subsequent Years)
1	Pollution Control ➤ Dust Suppression	1,00,000	1,00,000
2	Pollution Monitoring i) Air pollution ii) Water pollution iii) Soil Pollution iv) Noise Pollution	1,00,000 60,000 40,000 20,000	1,00,000 60,000 40,000 20,000
3	Plantation/ Green belt	3,82,500	6,82,500
4	Reclamation of mined out area	--	11,75,760
5	Occupational Health	1,00,000	50,000
Total		8,02,500	22,28,260

ADDITIONAL STUDIES

Risk Assessment and Disaster Management Plan

The complete mining operation will be carried out under the management control and direction of a qualified mine manager holding Mines Manager’s Certificate of Competency. Moreover, mining staff will be sent to refresher courses from time to time to keep them updated.

Disaster Management Plan

Emergency preparedness is an important aspect in the planning of Disaster Management. Personnel would be trained suitably and prepared mentally and physically in emergency response through carefully planned, simulated procedures. Similarly, the key personnel and essential personnel shall be trained in the operations.

PUBLIC CONSULTATION

Public Hearing

In consonance with the EIA notification dated 14th September 2006, vide section 1 (a) related to Public Hearing, the draft EIA/EMP report shall be submitted to the Uttarakhand Environment Protection & Pollution Control Board (UEPPCB) for public hearing

PROJECT BENEFITS

The impact on the civic amenities will be substantial after the commencement of mining activities. Medical facilities will be provided in the form of first-aid facility at the mine. These medical facilities will also be available to local people in the surrounding in case of emergencies.

- Generation of employment and improved standard of living;
- Increased revenue to the State by way of royalty, taxes and duties; and
- Superior communication and transport facilities etc.

The employment of local people in primary and secondary sectors of project will upgrade the prosperity of the region.

CONCLUSIONS

- The mining operations will meet the compliance requirements of MoEF&CC;
- Community impacts will be beneficial, as the project will generate significant economic benefits for the region;
- Adoption of Best Available Technology and Best Management Practices with more environmental friendly process; and
- With the effective implementation of the Environment Management Plan (EMP) during the mining activities, the proposed project can proceed without any significant negative impact on environment.