

**ENVIRONMENTAL IMPACT ASSESSMENT REPORT AND
ENVIRONMENTAL MANAGEMENT PLAN**

FOR

LIME STONE MINING

(KHASRA NO-3184, LEASE AREA- 21.106 HECTARES)

NEAR VILLAGE- CHAKDURA, (BATHYN AND KHREW)

TEHSIL-PAMPORE, DISTRICT-PULWAMA (JAMMU AND KASHMIR)

MINE LEASE PERIOD-20 YEARS

PRODUCTION CAPACITY- 53055 TPA (ROM)

STUDY PERIOD: 1ST MARCH 2016 TO 31ST MAY, 2016

MONITORING DONE BY VARDAN ENVIRO LAB (NABEL T-2629)

**(The Project falls in Category 'A' due to Dachigam Wildlife Sanctuary, 3.5 Km
towards N direction from mine lease boundary.)**



APPLICANT

MUSHTAQ MUZAFAR ANIM

M/s Dawar Cement Pvt. Ltd.

Tehsil- Pampore, District-Pulwama

(Jammu and Kashmir)



ENVIRONMENT CONSULTANT

VARDAN ENVIRONET

(QCI/NABET ACCREDITED NO. NABET/EIA/1316/IA001)

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(MAY 2017)



REVIEW AND REVISION HISTORY


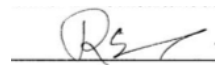
History of revisions of the present report:

Table I: History of the Revisions

S.No.	Rev.	Date	Modifications	Remarks
1.	Rev.00 Draft	12.08.2016	Draft EIA /EMP Report	Report has been prepared by team Vardan and all comment of reviewers has been incorporated in Draft EIA/EMP Report.

Table II: Record of Review

Rev.	Date	Description	Review-2	Approval
Rev.00	12.08.2016	Draft EIA/EMP Report	Mr. S.K. Sharma	Mr. R.S. Yadav
-	-	-		

Rev.	Date	Description	Review-2	Approval
Rev.01	20.05.2017	Final EIA /EMP Report	Mr. S.K. Sharma	Mr. R.S. Yadav
-	-	-		

This Report has been prepared by **Vardan EnviroNet** on behalf of and for the use of the **M/s Dawar Cement Pvt Ltd.** with due consideration and skill as per our general terms and conditions of business and terms of agreement with the **M/s Dawar Cement Pvt Ltd.**

DISCLAIMER

Vardan EnviroNet has taken all reasonable precautions in the preparation of this report as per its auditable quality plan. Vardan EnviroNet also believes that the facts presented in the report are accurate as on the date it was written. However, it is impossible to dismiss absolutely, the possibility of errors or omissions. Vardan EnviroNet therefore specifically disclaims any liability resulting from the use or application of the information contained in this report. The information is not intended to serve as legal advice related to the individual situation.



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ABBREVIATIONS

AAQM	Ambient Air Quality Monitoring
amsl	Above Mean Sea Level
bgl	Below Ground Level
CPCB	Central Pollution Control Board



ABBREVIATIONS	
dB	Decibel
DG	Diesel Generator
E	East
EIA	Environmental Impact Assessment
EMC	Environmental Management Cell
EMP	Environmental Management Plan
ENE	East of North- East
EPA	Environmental Protection Agencies
ESE	East of South East
FCC	False Colour Composite
GIS	Geological Information System
GPS	Global Positioning System
HP	Horse Power
Hr	Hour
IMD	Indian Meteorological Department
IRS	Indian Remote Sensing Satellite
ISCST	Industrial Source Complex, Short Terms
ISO	International Organization Of Standardization
ISS	Indian Standard Specification
KLD	Kilo Litre Per Day
Km	Kilometer
KW	Kilo Watt
LOS	Level of Service
m	Meter
MCDR	Mining Conservation & Development Rules
mg	Milligram
MoEF&CC	Ministry Of Environment Forest and Climate Change
N	North
NE	North-East
NNE	North of North-East
NNW	North of North-West
NO ₂	Nitrogen Dioxides
NTU	Naphelo Turbidity Unit
NW	North-West
OB	Over Burden
OH&S	Occupational Health and Safety
PCU	Passenger Car Unit
PM	Particulate Matter
PPE	Personal Protective Equipment
PPM	Part Per Million
Pvt.	Private
R&R	Rehabilitation and Resettlement
RDS	Respirable Dust Sampler
SE	South- East
SEIAA	State Level Environmental Assessment Authority
SO ₂	Sulphur-di-Oxide



ABBREVIATIONS	
SOI	Survey of India
SOPs	Standard Operating Procedures
SPCB	State Pollution Control Board
SPM	Suspended Particulate Matter
SSE	South of South-East
SSW	South of South-West
TDS	Total Dissolve Solid
TOR	Terms of Reference
TPA	Ton s Per Annum
TPA	Tone Per Hour
TPH	Tons Per Hour
TS	Total Solid
US EPA	United State Environmental Protection Agencies
w.e.f.	With Effective From
w.r.t.	With Reference To
W/W	Weight By Weight
WNW	West of North-West
WSW	West of South-West



DECLARATION BY CONSULTANTS

NABET Annexure–VII

Declaration by Experts contributing to the EIA of M/s Dawar Cement Pvt. Ltd.

Declaration by Experts contributing to the EIA:

I, hereby, certify that I was part of the EIA team in the following capacity that developed the above EIA.

EIA Co-ordinator:

Name : Mr. R.S Yadav

Signature & Date : _____

Period of involvement : June 2016 – Till date

Contact information : D-142, Sector-57, Sushant Lok-III, Golf Course Extension Road, Gurgaon(Haryana)

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Team Member:

Mr. Nemichand	Mr. Anshul Yadav	Mr. Aman sharma

Functional Area Experts (FAEs):

S.No	Functional Areas	Name of the expert/s	Involvement during May , 2016 – Till date	Signature & Date
1.	AP	Mr. S.k Sharma FAA Monika Gupta	a) Identifying the sources of emissions and mitigation measures. b) Site-specific micrometrology monitoring. C) Ambient Air Quality (AAQ) monitoring impact predictions and mitigations. d) Impact identification	
2.	WP	Mr. S.k Sharma FAA Monika Gupta	a) Selection of sampling locations b) Ground water quality monitoring & assessment impacts on water environment and mitigations. b) Identification, characterisation of	

Declaration

			effluent and treatments there of. c) Water balance and conservation measures	
3.	SHW	Mr. SK Sharma <u>FAA</u> Nishant Shakya	a) Identification of haze, solid w.g, and their disposal and mitigation measure. b) Recycling and disposal	
4.	SE	Mrs. Shilpa Mishra <u>FAA</u> Mr. Bhagwan Sahay	a) Determination of demographic profile including socio economy & livelihood b) Assessing the changes in socio economic pattern	
5.	EB	Dr. Vivek Narayan Singh	<u>Involvement during</u> Dec , 2016 – Till date a) Biological environment status in respect of of terrestrial fauna and aquatic eco system b) Impact on ecological environment	
6.	HG/Geo	Mr. R.S Yadav	a) Ground water resource assessment b) Impact on ground water potential and mitigation measures for avoiding ground water contamination.	
7.	AQ	Ms. Surbhi Makhwana <u>FAA</u> Avi	a) Processing of site- specific micro-meteorological data b) Collection and use of data for modelling. c) Air dispersion modelling for prediction of GLCS due to PM ₁₀ , SO ₂ and Nox.	
8.	NV	Mr. Asif Hussain <u>FAA</u> Ms. Neha Jain	a) Analysis of ambient noise quality data b) Impact due to plant noise and abatement measures c) Impact due to drilling and blasting	
9.	LU	Mr. Joshua Anand <u>FAA</u> Mr. Bhagwan Sahay	a) Analysis of data related to land use pattern b) Land use map development. c) Impact on land environment in respect to land for change	

10.	RH	Mrs. Anuradha Sharma	a) Identification of hazardous prone areas b) Environment risk evaluation c) On-site and Off-site emergency planning	
11.	SC	Mr. S. K Sharma <u>FAE</u> Piyush Verma	a)Monitoring, analysis and characterisation of soil. b)Assessment of impact on soil quality and mitigation measure.	

Declaration by the Head of the accredited consultant organization/ authorized person

I, R.S. Yadav, hereby, confirm that the above mentioned Limestone mining case of **M/s Dawar Cements Pvt. Ltd.** at Village– Chakdura, (Bathyn and Khrew) Tehsil-Pampore, District-Pulwama (Jammu and Kashmir)

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

I also confirm that I shall be fully accountable for any mis-leading information mentioned in this statement.

Name: **R.S.Yadav**



Signature

Designation: **Managing Director**

Name of the EIA Consultant Organization: Vardan Environet, QCI/NABET Accredited Environment Consultancy

Lime Stone Mine (Mine Lease Area 21.106 Ha.) Near Village-Chakdura, (Bathyn and Khrew),
Tehsil -Pampore, District-Pulwama (Jammu and Kashmir) By Dawar Cement Pvt. Ltd.

COMPLIANCE TO TOR CONDITIONS

Point wise compliance of ToR points issued by MoEF & CC vide F. No. J-11015/324/2013-IA.II (M) (Pt.) dated **22.01.2016** for the project of minor mineral "Lime stone mining" at Village-Chakdura (Bathyn,Khrew), Tehsil -Pampore, District- Pulwama (Jammu and Kashmir) (Area 21.106 Ha.) with production Capacity 53,055 TPA by M/s Dawar Cements Pvt. Ltd. Arco House, Shallapora, Allochi Bagh, Srinagar, J&K-190009.

ToR	Description	Reply	Citation
A. Standard ToR			
1	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification, 1994 came into force w.r.t. the highest production achieved prior to 1994.	Mining lease was granted to the project proponent by Govt of Jammu and Kashmir Civil Sectt. Industries & Commerce Department vide Govt. order no-317 IND of 2008 dated 31.12.2008. Mining lease was executed in 2009 and since 2008 to June 2013 the project proponent excavated 1, 17, 812 tones of lime stone without obtaining prior environmental clearance. Hence as per direction of MoEF & CC vide letter dated 01.04.2014 Jammu & Kashmir, SPCB has filed a prosecution against the project proponent in 2015 before the Hon'ble Court of Chief Judicial Magistrate Srinagar under section 15 of E (P) Act, 1986 will be. This mine is closed since June 2013. The project proponent has submitted the Board Resolution vide letter dated 18.04.2014 mentioning that no violation of E (P) Act, 1986 repeated in future.	Annexure-I
2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.	The copy of Lease Deed for mining lease issued by Govt. of Jammu and Kashmir Civil Sect. Industries and Commerce Department vide order no. 317 IND 2008/ dated 31.12.2008 and PP has applied for Environmental Clearance enclosed as Annexure-I.	Annexure-I
3	All documents including approved mine plan, EIA and public hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management and mining technology and should be in the name of the lessee.	Contents in all documents are synchronizing with one another in terms of mine lease area, production levels, waste generation, its management and mining technology. Both the mining plan and ML area in the name of Mushtaq Muzafar Anem who is the lessee of this project. Copy of Lease deed and the Approval Letter of Mining Plan is enclosed as Annexure I and II.	Annexure I Annexure-II



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ToR	Description	Reply	Citation
4	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ toposheet should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	All corners of the coordinates of ML area are superimposed on Toposheet of Survey of India Toposheet No. 43J16, 43N4, 43K13, 43O1 ; same has been furnished in this EIA/EMP Report. Land Use/Land Cover map has been prepared using High Resolution Imagery and also incorporated in EIA/EMP Report .	Chapter-1, Figure 1.1 at Page 4 Chapter-3, Figure 3.1 and Figure 3.2 at Page 23-24
5	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	All maps are provided superimposed on Toposheet of Survey of India. The key plan showing lease area has been prepared on the scale of 1:50,000. Geomorphology, Geological and Mineral Map of the area and Jammu and Kashmir is given in EIA/EMP Report .	Chapter-1, Figure 1.1 at Page 4. Chapter-2, Figure 2.3, at Page 13.
6	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	The lease area is a Govt. Waste Land and mineral rights vest with Mining Department, Govt. of Jammu and Kashmir, hence there is no need of land diversion in this case.	Annexure-I



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ToR	Description	Reply	Citation
7	<p>It should be clearly stated whether the proponent company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA report with description of the prescribed operating process/ procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large may also be detailed in the EIA report.</p>	<p>Yes, The company has formulated Environmental policy which is approved by its board of Directors. The operating process or the implementation of policy will be as follows:</p> <ul style="list-style-type: none"> • Compliance with all applicable environmental laws and regular maintenance of their records. • Acquaintance of all employees and contractors with their environmental responsibilities. • Focus on continuous improvement. • Continuous review of environmental achievements. • Half yearly submission of Compliance reports. • Conducting Internal Audits • Closing of NCs and conducting MRM <p>The Policy contains the hierarchical system of the company to deal with the environmental issues and for ensuring the compliance with EC conditions. All the non compliances/violations of environmental laws will be reported to the Top Managemnet. The details are incorporated in EIA/EMP. The Environmental Policy is incorporated as Annexure XII with this EIA/EMP Report.</p>	<p>Annexure - XII</p> <p>Chapter-6, Item 6.1 and 6.1.1 at Page 89-90</p>



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8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	<p>Mines safety for workers working at the site has been taken care of. Safety measures related to risks during mining activity has been proposed. The details are incorporated in of the EIA/EMP Report.</p> <p>The mining lease area shall be developed by opencast mechanized mining; hence subsidence study is not required.</p> <p>Slope Study The general slop of the area is towards south and is abruptly ending towards south and is abruptly ending towards south and form the wide valley floor Bathyan valley with gradual rise towards north and further South-East. The highest level is at 2242m amsl towards The north west of the area at pillar E and the lowest level is at 2042m amsl towards south east of the area at pillar BX.</p> <p>Blasting Study The blasting will be done by the authorized contractors on contractual basis. These contractors have their own safety explosive container as well as Explosive License.</p>	<p>Chapter 7, Item 7.5 at Page 131</p> <p>Chapter 2, Item 2.7at Page 17</p>
9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc should be for the life of the mine/ lease period.	<p>Study area comprises of 10 Km radius around the mine lease boundary. Map showing 10 Km radius of the key plan of the area has been furnished in EIA report and 10 Km radius of mine lease.</p> <p>No waste or sub grade mineral is expected as limestone is free of over burden, 5% waste in the form of khakh-bajri will be generated which shall be used as filling material.</p>	<p>Chapter-1, Figure 1.1 at Page 5</p> <p>Chapter-2, Item 2.9 at Page 19</p>



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10	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and Post-operational phases and submitted. Impact, if any, of change of land use should be given.	<p>Land Use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, National park, migratory routes of fauna, water bodies, human settlements and other ecological features has been incorporated in of EIA/ EMP Report.</p> <p>Land use plan of the mine lease area showing the preoperational, operational and post operational phases is incorporated in of the EIA/EMP Report.</p>	<p>Chapter-3, Item 3.1, Table 3.1, Figure 3.1 at Page 21-23.</p> <p>Chapter-2, Item 2.11, Table-2.15 at Page 19</p>
11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.	<p>No waste or sub grade mineral is expected as limestone is free of over burden, 5% waste in the form of khakh-bajri will be generated which shall be used as filling material.</p> <p>There is no human settlement in the area. Hence, neither villages nor any part of village or any hamlet will be disturbed during the entire life of the mine.</p>	<p>Chapter-2, Item 2.9 at Page 19</p> <p>Chapter 7, Item 7.7 at Page 157</p>
12	A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	The Mining Lease area does not involve any forest land. The land of the Mining lease area is Government Waste is free from any reservation of forest department, Govt. of Jammu and Kashmir. NOC from PCCF, Jammu, vide letter No. PCCF/Lease/NOC/57-61 dated 19.01.2005 is attached as Annexure IV .	Annexure-IV



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13	Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	The Mining Lease area does not involve any forest land. The land of the Mining lease area is Government Waste is free from any reservation of forest department, Govt. of Jammu and Kashmir. NOC from PCCF, Jammu, vide letter No. PCCF/Lease/NOC/57-61 dated 19.01.2005 is attached as Annexure IV .	Annexure-IV
14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not Applicable, There is no involvement of forest land in the project area. NOC from Govt. of Jammu and Kashmir. NOC from PCCF, Jammu, vide letter No. PCCF/Lease/NOC/57-61 dated 19.01.2005 is attached as Annexure IV .	Annexure-IV
15	The vegetation in the RF/ PF areas in the study area, with necessary details, should be given.	There is no National Park, Biosphere Reserves, Tiger Reserves, etc. within 10 Km radius. However, Dachigam Wildlife Sanctuary at 3.5 Km in N. Authenticated Distance Map and Letter from chief wildlife conservator attached as Annexure VI-B.	Chapter-1, Item 1.3, Table 1.1, at Page 2 Annexure-VI-B
16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly detailed mitigative measures required, should be worked out with cost implications and submitted.	Survey has been carried out by the Ecology and Biodiversity Expert in and around the lease area to study the wild life of the area. Details are incorporated in the EIA/EMP Report. Details of probable impacts and possible mitigation measures are incorporated in the EIA/EMP Report.	Chapter 3 Item-3.10 at Page 43



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17	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, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the State Wildlife Department/ Chief Wildlife Warden under the Wildlife (Protection) Act, 1972 and copy furnished.	There is no National Park, Biosphere Reserves, Tiger Reserves, etc. within 10 Km radius. However, Dachigam Wildlife Sanctuary at 3.5 Km in N. Authenticated Distance Map and Letter from chief wildlife conservator attached as Annexure VI.	Chapter 1, Table-1.3 at Page 3 Annexure-VI
18	A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	Detailed survey was conducted to evaluate floral and faunal composition of the study area. Primary data on floral and faunal composition was recorded during site visit and secondary data was collected from the Forest department and published relevant literature and the details are incorporated in EIA /EMP Report.	Chapter 3 Item -3.9 at Page 44



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19	Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered.	The project site is not falling in proximity to area declared as Critically Polluted. The valid and lawful fourth renewal of this lease has been granted to the lease holder by the Mining Department of Jammu and Kashmir, Government as enclosed in Annexure-I . Letter from PCCF, Jammu, vide letter No. PCCF/Lease/NOC/57-61 dated 19.01.2005 is attached as Annexure IV . Area is free from Forest.	Annexure-I Annexure-IV
20	Similarly, for coastal projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t. CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not Applicable, since the project site does not comes under coastal area.	Chapter-1, Item 1.3, Table 1.1, at Page 3
21	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/ National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programs prepared and submitted accordingly, integrating the sectoral programs of line departments of the State Government. It may be clearly brought out whether the village located in the mine lease area will be shifted or not. The issues relating to shifting of Village including their R&R and socio-economic aspects should be discussed in the report.	No displacement is involved for the proposed project. Hence, R&R plan is not applicable for the project.	Chapter 7, Item 7.7 at Page 157



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22	One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season); December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant Downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM ₁₀ , particularly for free silica, should be given.	<p>Baseline data of study area within 10 Km radius of the project site was collected during March, 2016 to May, 2016.</p> <p>The details of monitoring results (Air, Water, Noise, Soil) and the flora and fauna details are incorporated in the EIA/EMP Report. The lab reports of Air, Noise, Water and Soil are attached as Annexure VI-XI.</p>	<p>Chapter 3, Item 3.4 to Item 3.9 at Page 43</p> <p>Chapter 3, Item 3.4 to Item 3.8 at Page 25-43.</p> <p>Annexure VI-XI</p>
23	Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing predominant wind direction may also be indicated on the map.	<p>Air quality modeling was carried out and impact of Air quality has been incorporated in EIA/EMP report.</p> <p>The predominant wind direction recorded during study period was from SW to NE direction.</p> <p>Wind rose diagram is provided in EIA/EMP report.</p>	<p>Chapter 4, Item 4.3 at Page 61-67</p> <p>Chapter 3, Figure -3.3 at Page 27</p>



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24	The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.	Water requirement in this project site is 20 KLD. Water will be taken from existing water sources from nearby villages or tanker supplier. The details are incorporated in EIA/EMP Report . Total Water Requirement= 20 KLD Dust Suppression = 14.5 KLD Plantation=3.5 KLD Domestic Purpose= 2.0 KLD	Chapter 2, Item 2.12.1 at Page 19, and at Figure 2.8 at Page 19
25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Not Applicable Water will be taken from near villages through tankers.	Chapter 2, Item 2.12.1 at Page 19, and at Figure 2.8 at Page 19
26	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	Artificial rainwater harvesting is not proposed for this project because it is a Limestone Mining Project. In this Mining, Pits will be act as rain water harvesting pit at the end of conceptual stage.	—
27	Impact of the project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.	<u>Surface Water</u> There will not be any adverse impact on the surface water as there is no any water stream/body crossing. There is no waste water disposed off outside the premises. <u>Ground Water</u> The ground water level of the lease area is 10 m approximately. In this mining project in the entire lease period the ground water table will not be intersected hence there will be no impact on the water environment. Impact of the project on the water quality and its mitigation measures has been incorporated in EIA/EMP report.	Chapter 4, Item 4.7, at Page 71



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28	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. 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.	<p>The ground water level of the lease area is 10 m approximately. In this mining project in the entire lease period the ground water table will not be intersected hence there will be no impact on the water environment.</p> <p>Systematic diagram of mining depth also incorporated in EIA/EMP report.</p> <p>Water will be sourced from the hired tankers.</p>	Chapter 4, Item 4.7, Figure 4.6 at Page 73
29	Details of any stream, seasonal or otherwise, passing through the lease area and modification /diversion proposed, if any, and the impact of the same on the hydrology should be brought out.	<p>There is no stream modification/ diversion proposed in the lease area.</p> <p>The ground water level of the lease area is 10 m approximately. In this mining project in the entire lease period the ground water table will not be intersected hence there will be no impact on the water environment.</p>	Chapter 2, Table 2.1 at Page 11
30	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.	<p>Maximum Working Depth : 10m above Surface Level</p> <p>Ground water table: 10 m bgl</p> <p>Information about site elevation, working depth has been incorporated in EIA/EMP Report.</p> <p>Schematic diagram of mining depth also incorporated in EIA/EMP Report.</p>	<p>Chapter 4, Fig 4.6 at Page 73</p> <p>Chapter 4, Item 4.7, Figure 4.6 at Page 73</p>



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31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	<p>A suitable combination of trees that can grow fast and also have good leaf cover shall be adopted to develop the greenbelt. It is proposed to plant 1000 trees/Year of native species along with some fruit bearing and medicinal trees during the plan period</p> <p>Progressive Green belt Development Plan have been incorporated in EIA/EMP Report.</p> <p style="text-align: center;">Schedule of Plantation for the Five Years</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Saplings to be planted</th> <th>Survival (@ 70%)</th> </tr> </thead> <tbody> <tr> <td>I</td> <td>1000</td> <td>700</td> </tr> <tr> <td>II</td> <td>1000</td> <td>700</td> </tr> <tr> <td>III</td> <td>1000</td> <td>700</td> </tr> <tr> <td>IV</td> <td>1000</td> <td>700</td> </tr> <tr> <td>V</td> <td>1000</td> <td>700</td> </tr> <tr> <td>Total</td> <td>5000</td> <td>3500</td> </tr> </tbody> </table> <p>Source: Mine Plan</p>	Year	Saplings to be planted	Survival (@ 70%)	I	1000	700	II	1000	700	III	1000	700	IV	1000	700	V	1000	700	Total	5000	3500	Chapter 10, Item 10.6, Table 10.1 at Page 168
Year	Saplings to be planted	Survival (@ 70%)																						
I	1000	700																						
II	1000	700																						
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V	1000	700																						
Total	5000	3500																						
32	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.	Impact on local transport infrastructure due to the project has been assessed. There will not much impact on local transport as only 6 dumpers/day [6 no. x 3 trips/day x 2 (up/down) = 36] will be required for transport of mineral from mine. The LOS value from the proposed mining will be same as earlier values for NH-1A and MDR-1. So the additional load on the carrying capacity of the concern roads is not likely to have any significant adverse affect. Traffic density from the proposed mining activity has been incorporated in EIA/EMP Report and traffic study detailed enclosed as Annexure-X .	Chapter 3 Item 3.8, at Page 41-43. Annexure-X																					
33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA report.	Adequate infrastructure and other facilities will be provided to mine worker. Information about onsite shelter and facilities for workers has been incorporated in EIA/EMP Report .	Chapter 2, Item 2.12.3 at Page 20																					



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34	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.	Conceptual post mining Land use is incorporated in EIA/EMP Report.	Chapter 2, Item 2.11, Table 2.3 at Page 19
35	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area May be detailed.	The impact on OHS of employee and proper mitigation along with budgetary provision incorporated in EIA/EMP Report. Person protective measures, pre-placement medical examination and periodical medical examination schedules, management plan have been furnished in EIA/EMP Report.	Chapter 4, Item 4.14 at Page 81 Chapter-7, Item 7.5 Table 7.7, at Page 113
36	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	Public health implication like respiratory disorder, noise induced problems are major issues which will be addressed properly. Study has been performed which includes to gain an understanding of the source, identification of exposure pathway and determination of likely receptor. The impact will not be concentrated and confined to particular zone. Periodic health camps will be undertaken under CSR activities in the villages. Details incorporated in EIA/EMP Report. Rs 20 Lakhs will be spent on Health check up camps, Surveillance programme for the Public, Sanitation and drinking water facilities. The budgetary allocations of for public health implication are incorporated in EIA/EMP Report.	Chapter 10, Item 10.8, at Page 127 Chapter-7 Item 7.8 at Page158 and Table 7.9 at Page 158



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37	Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	<p>Socio economic measures for the local people have been proposed under the component of the Corporate Social Responsibility along with the budgetary allocation have been incorporated in EIA/EMP Report.</p> <p>Proposed project will provide the employment opportunity to the local community hence project will have positive impact on the surrounding local community.</p> <p>An amount of Rs. 16.0 Lakhs is allocated for CSR activities. Detailed break up is incorporated in EIA/EMP Report.</p>	<p>Chapter 7, Item 7.7, at Page 156</p> <p>Chapter-7 Item 7.8 at Page158</p>
38	Detailed environmental management plan to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.	<p>Details of environment management plan are incorporated in EIA/EMP Report.</p> <p>Details of occupational health impacts along with proposed mitigation measures are incorporated in EIA/EMP Report.</p>	<p>Chapter-10, Item 10, at Page 170</p> <p>Chapter 4, Item 4.14 at Page 81</p>



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ToR	Description	Reply	Citation
39	Public hearing points raised and commitment of the project proponent on the same along with time bound action plan to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	<p>Public hearing has its own significant in the Environment impact assessment process. As per EIA Notification 2006, the draft EIA report is submitted to State Pollution Control Board for conducting the public consultation for the proposed project. During this stage the opinion of the public residing near by the project area is addressed and their concerns and suggestions are recorded. Based on that Final EIA report is prepared, which is submitted to Ministry of Environment & Forest for its appraisal.</p> <p>Following the EIA process laid down by the EIA notification 2006 & its amendments the draft EIA report was prepared in July-16 after collection of baseline data in pre-monsoon period from March- May 2016. The proponent submitted the draft EIA report in State pollution control Board, J&K for its public hearing but due to hostile law and order situation in Kashmir valley including district Pulwama, Pollution Control Board Jammu and Kashmir was unable to conduct the public hearing.</p> <p>Considering the current scenario, project proponent approached MoEF&CC, New Delhi to exempt the public hearing for the proposed project and submitted a request vide its letter dt. 19.9.2016 (Annexure- XIII). In response, Ministry of Environment, Forest & Climate Change vide its letter no. F. No. J-11015/324/2013-IA-II (M) (Pt) dt. 3d November 2016 (Annexure- Annexure-XIV) requested Chairman, Pollution Control Board, J&K to conduct the public hearing through the D.C. Pulwama with a copy to D.C. Pulwama district for necessary action. Considering the current Law & Order scenario of the district, D.C. Pulwama by his letter no. DCP/PA/16/1330-31 dt. 28.11.2016 (Attachment- Annexure- XV) informed MoEF&CC, New Delhi that conducting Public hearing is not feasible in current scenario.</p> <p>In this regard, as per point no. V of the EIA Notification 2006, para 7, sub para 7 (i), Stage 3 Public consultation, If the public agency or nominated authority like SPCB reports to the regulatory authority concerned that owing to the local situation, it is not possible to conduct the</p>	Annexure- XIII to XVI.



Lime Stone Mine (Mine Lease Area 21.106 Ha.) Near Village-Chakdura, (Bathyn and Khrew),
Tehsil -Pampore, District-Pulwama (Jammu and Kashmir) By Dawar Cement Pvt. Ltd.

ToR	Description	Reply	Citation
		<p>public hearing in a manner which will enable the views of the concerned local persons to be freely expressed, it shall report the facts in detail to the concerned regulatory authority, which may, after due consideration of the report and other reliable information that it may have, decide that the public consultation in the case need not include the public hearing.</p> <p>In view of letter of MoEF&CC GOI letter dated 3.11.2016 the public hearing was not conducted due to worst situation of law and order as reported by district collector in Pulwama Dated 28.11.16. However the MoEF&CC GOI directed the J&K State Pollution Control Board to conduct the public consultation. Accordingly J&K State Pollution Control Board made public notice via 3 News Paper Greater Kashmir dated 04-02-2017 and Kashmir Reader dated 01-02 2017 and Subah Kashmir dated 01-02-2017 to raise any objection/suggestion regarding environmental clearance of the mining project in the office of Member Secretary J&K State Pollution Control Board. During public consultation many objections and suggestions were received and the summary of the public consultation was submitted to Director (Mining) MoEF&CC GOI vide letter no 105 dated 25.04.17 by Member Secretary J&K State Pollution Control Board, copy enclosed as annexure XVI.</p>	
40	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the project should be given.	The Committee noted that it is a violation case as the PP had started production of limestone without obtaining requisite prior environmental clearance since 2008 to 2013. As per the PFR, the PP had mined out 1,17,812 tons of limestone. PP informed that the mine is closed since June 2013.	Chapter -2 2.13 at Page 20
41	The cost of the project (capital cost and recurring cost) as well as the cost towards implementation of EMP should clearly be spelt out.	<p>The costs of project as well as the cost of EMP have been incorporated in EIA/EMP Report.</p> <ul style="list-style-type: none"> • Cost of the project is Rs. 8.0 Crores • Cost for Environmental Protection Measures are Rs 32.00 Lakh per annum • Cost of OH&S is Rs 20.00 Lakh per annum • Cost for CSR is Rs 16.00 Lakh per annum 	Chapter 1, Item 1.3 and at Page 3



Lime Stone Mine (Mine Lease Area 21.106 Ha.) Near Village-Chakdura, (Bathyn and Khrew),
Tehsil -Pampore, District-Pulwama (Jammu and Kashmir) By Dawar Cement Pvt. Ltd.

ToR	Description	Reply	Citation
42	A Disaster Management Plan shall be prepared and included in the EIA/EMP report.	The Disaster Management Plan has been prepared and incorporated in EIA/EMP Report .	Chapter 7, Item 7.3 at Page 112
43	Benefits of the project if the project is implemented should be spelt out. The benefits of the project shall clearly indicate environmental, social, economic, employment potential etc.	The benefits of the project has been prepared and incorporated in EIA/EMP report.	Chapter 9, Item 9.0 at Page 162
B. Additional ToR			
44	Details of transportation of mined out materials as per Indian Road Congress for both the ways (loaded as well as unloaded trucks) load and its impact on environment.	Traffic study is discussed in EIA/EMP Report and its impact assessment is presented in this EIA/EMP report.	Chapter 3, Item 3.9 at Page 41 Chapter 4, Item 4.15 at Page 82
45	Proper species specific Conservation plan for schedule-I and II species.	The conservation plan for Schedule species present in 10 Km area and has been prepared and submitted to Chief Wildlife Warden J&K for its approval. Amount of Rs. 15 Lakhs has been kept for implementation of this plan. Receiving copy of the same is attached.	
46	Necessary NBWL clearance should be obtained.	Dachigam Wildlife Sanctuary falls within 10 Km radius of Mine area. NBWL Clearance application is being filled by Project proponent.	
Besides the above , the below mentioned general points are also to be followed:-			
a)	All documents to be properly referenced with index and continuous page numbering.	Compiled	
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.	Indicated	
c)	Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All original analysis/testing reports should be available during appraisal of the project.	Enclosed	
d)	Where the documents provided are in language other than English, an English translation should be provided.	Provided	
e)	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall be filled and submitted.	Enclosed	



Lime Stone Mine (Mine Lease Area 21.106 Ha.) Near Village-Chakdura, (Bathyn and Khrew),
Tehsil -Pampore, District-Pulwama (Jammu and Kashmir) By Dawar Cement Pvt. Ltd.

ToR	Description	Reply	Citation
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 be followed.		Followed
g)	Changes, if any made in the basic scope and project parameters (as submitted in Form-1 and the PFR for securing TOR) should be brought to the attention of MoEF&CC with reasons for such changes and the permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.		26-7-2016
h)	As per the circular no. J-11011/618/2010-IA(I) dated 30.05.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.		Not Applicable
i)	The EIA report 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.		Included



CHAPTER-1

INTRODUCTION

PRELUDE

EIA is different from other decision-making tools like environment audit, which is conducted on existing projects, while the EIA is applied to new projects and the expansion of existing projects. EIA uses the techniques of science, economics, sociology, geology etc while assessing the project because it is dealing with events, which have not yet occurred, may not occur, but whose chances of occurrence may be strong in future. There are various other tools like cost-benefit analysis, environment management systems and risk analysis. EIA is by far the most suitable tool for any proposed project. It is also one of the most popular decision-making tools and has been integrated in the regulatory system of many countries.

We have collected data for one season *i.e.* from 1st March 2016 to 31st May 2016. The ToR was issued on date **22nd January 2016** by MoEF&CC, GoI, vide letter no. **J-11015/324/2013-IA.II (M)** and Amendment in ToR was issued on vide letter no. **J-11015/324/2013-IA.II (M) dated 14th September 2016** regarding Production capacity from 50,000 TPA (ROM) to 53055 TPA (ROM)

1.0 PURPOSE OF REPORT

The Environmental Impact Assessment has been prepared to assess the current environmental scenario of the area and then based on the activities of the mining proposed, to carry out Environment Management Plan (EMP). This plan will identify and address the impacts, where these are adverse in nature, and thereafter design mitigative measures to manage such impacts in a manner as to conserve environment and ecology of the area. The EMP has been prepared with a view to ultimately ensure that the adverse impacts are minimized if these cannot be prevented altogether.

1.1 DETAILS OF MINING ACTIVITY, LOI AND CONSULTANT

Lease: Mining lease of limestone mining has been issued by the Govt. of Jammu and Kashmir, Civil Sect. Industries and Commerce Department vide order no. 317 IND 2008 dated 31.12.2008 in favor of Sh. Mushtaq Muzaffar Anim S/O Haji Mohd. muzafar Anim M/s Dawar Cement Pvt. Ltd. for mining of Lime stone with project area 21.106 HA. (Copy of Mining lease letter has been enclosed as **Annexure-I**).

Lease Period: 20 Years (26 March 2009-25.03.2029).

Mine Plan & Progressive Mine Closure Plan: The Mining Scheme & Progressive Mine Closure Plan of proposed Lime Stone lease area was approved vide 614(2)/MS-B-235/13-DDN dated 6.11.2013 Under MCDR 1960 It is prepared by RQP G.N. Chowdry, (RQP No. RQP/DDN/0148/2002/A) (Copy of Approved letter of Mining Scheme & Progressive Mine Closure Plan has attached as **Annexure-II**)

Category "A": As per EIA Notification dated 14th September, 2006 and amendment in MoEF&CC GOI Notification dated 15.Jan 2016 this project falls under Category "A", 1(a), due to area 21.106 Ha. and Dachigam Wildlife Sanctuary lies within 10Km radius from mine lease boundary. In this context, the applicant submitted TOR/EC application along with Form-I and Pre-Feasibility Report to Ministry of Environment & Forests, New Delhi and requesting for issue of "Terms of Reference" (ToR). TOR has been accorded by MoEF&CC, GoI vide letter no. **J-11015/324/2013-IA.II (M) dated 22th January 2016**. Baseline study period pre Monsoon *i.e.* **March, 2016 to May, 2016** (Copy attached as **Annexure III a, b**).

1.1.1 Year-wise production detail since 2008 - 2013

Mining lease was granted to the project proponent by Govt of Jammu and Kashmir Civil Sectt. Industries & Commerce Department vide Govt. order no-317 IND of 2008 dated 31.12.2008. Mining lease was executed in 2009 and since 2008 to June 2013 the project proponent excavated 1, 17, 812 tones of lime stone without obtaining prior environmental clearance. Hence as per direction of MoEF & CC vide letter dated 01.04.2014 Jammu & Kashmir, SPCB has filed a prosecution against the project proponent in 2015 before the Hon'ble Court of Chief Judicial Magistrate Srinagar under section 15 of E (P) Act, 1986. This mine is closed since June 2013. The project proponent has submitted the Board Resolution vide letter dated 18.04.2014 mentioning that no violation of E (P) Act, 1986 repeated in future.



1.2 IDENTIFICATION OF PROJECT AND PROJECT PROPONENT

#	Name of the Mine lease area	Applicant/s	Proponent Name
1.	Lime Stone Mine, Mine Lease Area-21.106 Ha. Near Village Chakdura (Bathyn and Khrew), Tehsil-Pampore, District- Pulwama (J&K)	M/s Dawar Cement Pvt. Ltd. Tehsil- Pampore, District- Pulwama (Jammu and Kashmir) Pincod-190009	Mushtaq Muzafar Anim Tehsil- Pampore, District- Pulwama (Jammu and Kashmir) Pincod-190009

1.3 BRIEF DESCRIPTION OF NATURE, SIZE, LOCATION OF THE PROJECT

Table 1.1 Brief Description of the Project

S. No.	Particulars	Details		
A.	Nature and Size of the Project	The proposed mining area is situated in Village- Chakdura (Bathyn,Khrew), Tehsil -Pampore , District- Pulwama (Jammu and Kashmir). The production capacity of this lease area is proposed as 53,055 TPA of Lime stone. The Mining lease area is Govt. waste land (Siwai Chak Land).		
B.	Location			
	Name of Unit	Khasra Number	Area of Block (ha.)	
	Lime Stone Mine	3184	21.106	
	Total		21.106 Ha.	
	Village	Bathyn Khrew		
	Tehsil	Pampore		
	District	Pulwana		
	State	Jammu and Kashmir		
Coordinates	Latitude & Longitude of Lime Stone Mine	Pillar No.	Latitude	Longitude
		Bx	34°03'15" N	75°00'45" E
		Ax	34°03'18" N	75°00'39" E
		Hx	34°03'19" N	75°00'36" E
		A	34°03'24" N	75°00'32" E
		B	34°03'22" N	75°00'28" E
		C	34°03'26" N	75°00'23" E
		D	34°03'29" N	75°00'16" E
		E	34°03'42" N	75°00'19" E
		F	34°03'38" N	75°00'23" E
		G	34°03'26" N	75°00'32" E
		H	34°03'31" N	75°00'45" E
	Dx	34°03'27" N	75°00'47" E	
	I	34°03'16" N	75°00'46" E	
	Toposheet (OSM) No.	43J16,43N4,43K13,43O1		
C.	Lease Area Details			
	Lease Area	21.106 Ha.		
	Type of Land	Govt. waste Land (Siwai Chak Land)		
	Topography	The topography of the area forming the hills of Pir Panjal Range is mountainous and rugged one. It is characterized by deep ravines having steep to moderate slopes. The area is marked by small ridges and depression. The ridges trending north and north-west.		
	Site Elevation Range	2242 AMSL to 1942 AMSL		Source: Google earth



S. No.	Particulars	Details
D.	Cost Details	
	Cost of the project	Rs. 8.00 Crores
	Cost for EMP	Rs. 32.00 Lakhs per annum
	Cost of CSR	Rs. 16.00 Lakhs
	Cost of OH&S	Rs. 20.00 Lakhs
'E.	Details of Environmental Setting	
	Ecological Sensitive Areas (v National Park, Wild Life Sanctuary, Biosphere Reserve, Reserve/ Protected Forest etc.) within 10 Km radius	There is no Biosphere Reserves, Tiger Reserves, Wildlife Corridors, etc. within 10 km radius. However Wildlife Sanctuary within 10 Km radius of study area is hereunder: Dachigam Wildlife Sanctuary: ~3.5 Km in N direction.
	Archaeological Important Place	None
	Nearest Town/ city	Khrew ~3.00 Km, SW.
	Nearest Post Office	Bathyn ~1.00 Km approx. NE
	Nearest Police station	Khrew ~ 3.00 Km SW
	Nearest Railway Station	Pampore Railway station ~12.35 Km, SW
	Education Facilities	Government high school Zantrag~ 1.00 Km in W direction.
	Medical Facilities	District Hospital Shopial~5.00 Km, W.
	Nearest National Highway	NH -1A, 1.68 Km, SE
	Nearest Airport	Srinagar Air port ~23.00 Km, W
	Water body	Jhelum river ~9.00 Km, SW
	Seismic Zone	Zone VI

(Source: Site visit /Baseline Data and Pre-feasibility Report)

All corner-coordinates of ML area are superimposed on Toposheet of survey of India and same has been furnished here in the **Figure 1**.



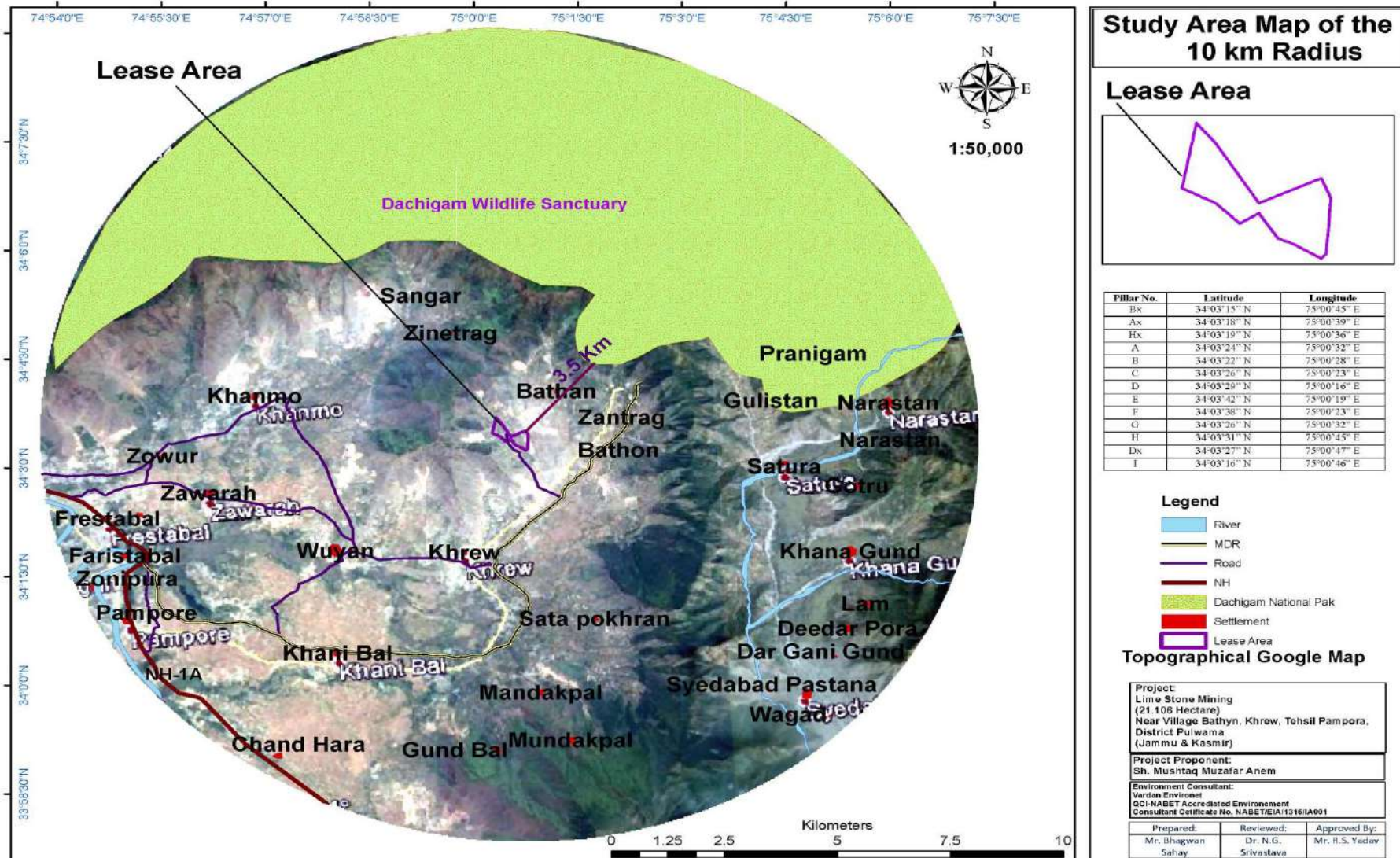


Figure 1.1: Key Plan showing the Environ Study area along with the Coordinates of Mine Lease area



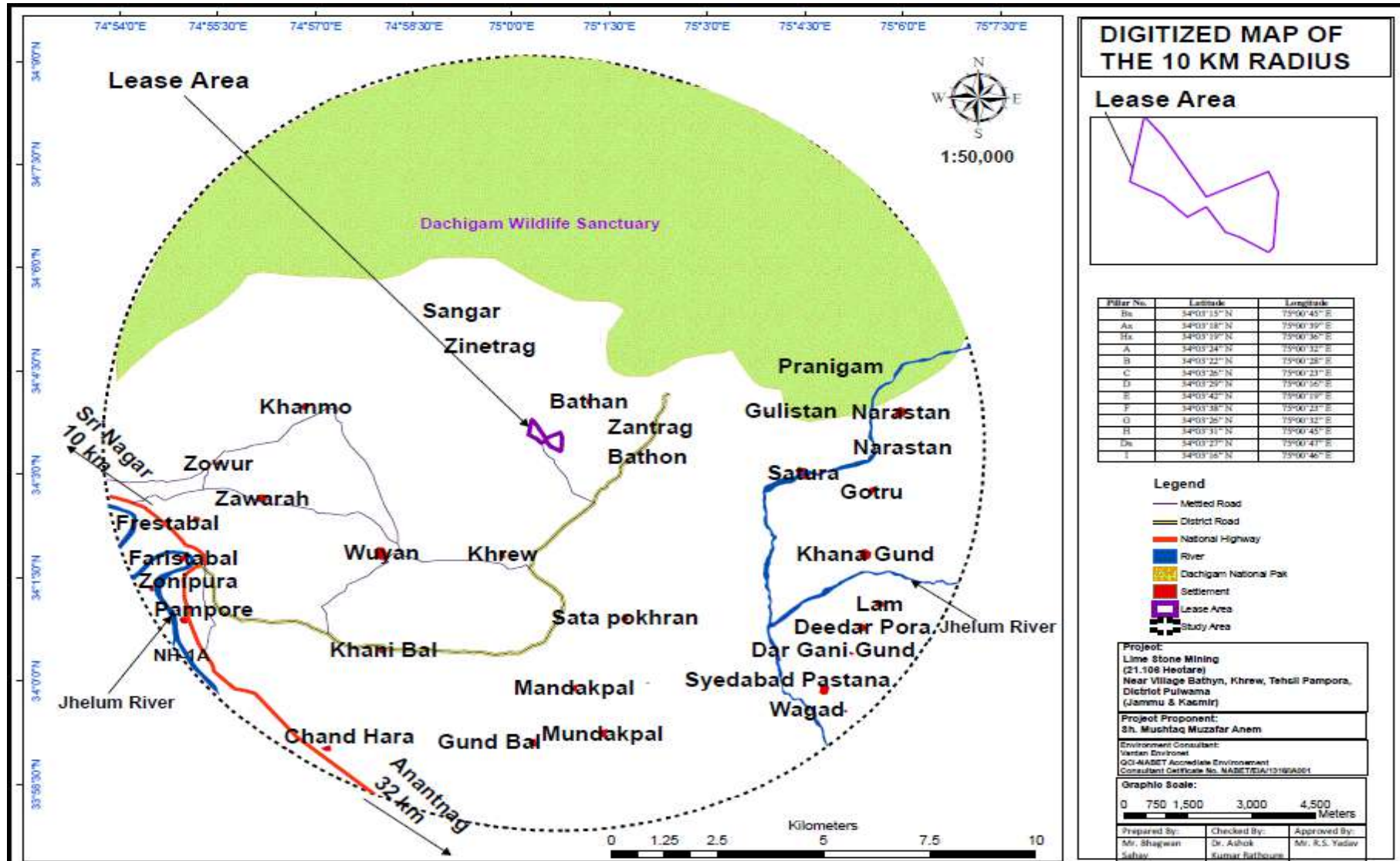


Figure 1.2: Digitized map showing the Environmental Settings of the Study area



1.4 SCOPE OF STUDY

The scope of the study includes a detailed characterization of the environment in an area of 10 Km. radius of the Mine Lease Area for various environmental parameters like Air, Water, Noise, and Land, Biological and Socio-economic aspects.

1.4.1 Preparation of EIA

The EIA includes the following details:

- 1) Study of the reports like Geological report, Pre-Feasibility Report (PFR) or mining plan made available by the client.
- 2) Present Environmental Setting
- 3) Identification, prediction and evaluation of Anticipated Environmental Impact due to the proposed mine and related facilities.

The environmental impacts would be anticipated in core and buffer zone on:

- Topography and drainage,
- Climate,
- Water quality (Surface/Ground),
- Hydro-geological Regime,
- Air quality,
- Noise Levels,
- Soil Quality,
- Flora and Fauna,
- Traffic density survey,
- Land-Use,
- Socio-Economic Conditions,
- Habitat,
- Health, culture, human environment including public health, occupational health and safety
- Sensitive Places/Historical Monuments.

This Final EIA Report is prepared in accordance with the Terms of Reference issued by Expert Appraisal Committee (EAC) of MoEF&CC, New Delhi vide ToR letter no J-11015/324/2013-IA.II (M) (Pt.) dated 22 January 2016 and 14th September 2016.

This EIA Report is prepared in accordance with has been divided into twelve chapters (in addition to Executive Summary) as briefed hereunder:

Chapter 1 – Introduction

The chapter provides description of project background, site and surroundings, objectives, scope and organization of the study and format of this report.

Chapter 2 – Project Description

This chapter provides information on project and capacity; need for the project; location; size or magnitude of operation; technology and process description; maps showing project layout, component of projects etc.

Chapter 3 – Description of the Environment

This chapter deals with the methodology and findings of field studies undertaken with respect to ambient air, meteorology, water, soils, noise levels, ecology to define the various existing environmental status in the area of the project. This also deals with the infrastructural development as a part of project and sources of pollution from the proposed mining project.

Chapter 4 – Anticipated Environmental Impacts and Mitigation Measures

In this chapter, the potential impacts of the proposed mining and allied activities, which could cause



significant environmental concerns, are identified and discussed. This discussion will form the basis for environmental management activities.

Chapter 5 – Analysis of Alternatives (Technology and Site)

This chapter will include a comparison of alternatives in this chapter to determine the best method of achieving the project objectives with minimum environmental impacts or indicates the most environmentally friendly and cost effective options, if any.

Chapter 6 – Environmental Monitoring Program

This chapter will include ascertaining the environmental impacts; state of pollution within the mine lease and in its vicinity; planning for predictive or corrective actions in respect of pollution to keep it within permissible limits.

Chapter 7 – Additional Studies

This chapter will include outcomes of public consultation, risk assessment, social impact assessment, R&R action plan, biodiversity conservation plan, watershed management etc.

Chapter 8 – Project Benefits

This chapter deals with improvements in the physical infrastructure, social infrastructure, employment potential and other tangible benefits due to proposed project activity.

Chapter 9 – Environmental Cost Benefit Analysis

This chapter includes environmental value enhancement (biodiversity, crop productivity, eco tourism etc.)

Chapter 10 – Environmental Management Plan

This chapter will include the description of administrative aspects of ensuring that the mitigation measures suggested are implemented and their effectiveness is monitored, after approval of the EIA.

Chapter 11 – Summary

This will constitute the summary of EIA Report.

Chapter 12 – Disclosure of Consultant

This will include the names of the consultants engaged in preparation of EIA and nature of consultancy rendered.

1.5 LAWS APPLICABLE TO THIS PROJECT

The Acts, Notifications, Rules and Amendments applicable for setting up a new mining industry or its expansion of an existing mine and for operation of a mine include the following:

- The Water (Prevention & Control of Pollution) Acts 1974
- The Water (Prevention & Control of Pollution) Acts 1977
- The Air (Prevention & Control of Pollution) Acts 1981
- The Environment (Protection) Acts 1986
- The Manufacture, Storage & Import of Hazardous Chemical Rules, 1989 (Including amendment rules 1994 & 2016)
- The Public Liability Insurance Act 1991 & Rule 1991
- Bio-Medical Waste (Management & Handling) Rule 2016
- The Indian Electricity Act 1910 & Rules 1956.
- The Petroleum Act 1934 as amended in 1997 & Rule 1976, as amended till 2002
- Contract Labour (Regulation & Abolition) Act 1970 & Its Central Rule 1971
- The Central Motor Vehicle Rules 1989 (Under Motor Vehicle Act 1988)
- The Workmen's Compensation Act 1923 as amended up to 2000/ Rule 1924, 1935, 1991 & 1996.



CHAPTER-2

PROJECT DESCRIPTION

2.0 GENERAL

This chapter gives broad description of the project, location, type of ore deposit(s), quantity and quality of reserve, Mining Methodology, various site utilities and infrastructure, aspect and impact etc. The downstream use of mineral for value addition and its importance is also described in this chapter.

The project is proposed for mining of Mineral Lime Stone Mine over an area of 21.106 Ha. with production capacity of **53,055 TPA (ROM)** in near Village chakdura, Bathyn and Khrew, Tehsil -Pampore, District-Pulwama (Jammu and Kashmir) By Mushtaq Muzafar Anim. It is an opencast mechanized mining project to excavate Mineral Lime Stone from the lease area granted by civil sectt. Industries and commerce Department, Govt. of Jammu and Kashmir.

2.1 PROMOTOR'S BACKGROUND

Dawar Cements Private Limited was registered at Registrar of Companies Jammu on 09 May, 2002 and is categorized as Company Limited by Shares and an Indian Non-Government Company. Dawar Cements Private Limited's Corporate Identification Number (CIN) is U26942JK2002PTC002213 and Registration Number is 002213.

Dawar Cements Private Limited currently have 3 Active Directors / Partners: Mushtaq Muzaffar Anim, Manzoor Ahmad Anim, Javaid Ahmad Anim, and there are no other Active Directors / Partners in the company except these 3 officials.

Dawar Cements Private Limited is involved in Manufacturing - Metals & Chemicals, & Products Thereof Activity and currently company is in Active Status. Dawar Cements Private Limited registered address on file is C/o Arco Traders Km Building Sarai Bala Jammu and Kashmir India.

2.2 NEED FOR THE PROJECT

The said project plays a significant role in the domestic as well as infrastructural market. Limestone has many industrial uses and can be used as mined or processed into a wide variety of products. It is the raw material for a large variety of construction, agricultural, environmental, and industrial materials.

Limestone is used in construction almost everywhere. In 2007, crushed limestone was 68% of all crushed rock produced in the United States. Also, limestone is the key ingredient in making Portland cement. Despite our Nation's abundance of limestone, there have been cement shortages in recent years.

Some of the purest of natural limestone are marbles. For centuries, marble has been the decorative stone of choice in government buildings and public statues. Travertine is also used as a dimension stone in tiles and tabletops. Some white limestone is simply crushed and sieved for use in landscaping and roofing.

Powdered limestone is used to remove impurities from molten metal like steel. It can also remove toxic compounds from the exhaust of coal-burning power plants. Limestone is used as a filler in a variety of products, including paper, plastic, and paint. The purest limestone is even used in foods and medicines such as breakfast cereals and calcium pills.

Limestone is also the raw material for making lime (CaO) that is used to treat soils, purify water, and smelt copper. Lime has many additional uses in the chemical industries.

Dolomites are commonly less suitable than other industrial limestones for most applications. Most dolomite that is mined is simply crushed and sieved for use as aggregate in concrete or asphalt. Lime Stone is used in various building and construction works etc. and will be sold to nearby markets to fulfill the requirements of the local people.

2.3 DESCRIPTION OF MINE LEASE AREA

The proposed project is for mining of Lime Stone over an area of 21.106 Ha. near Bathyn and Khrew, Tehsil -Pampore, District- Pulwama (Jammu and Kashmir) by Mushtaq Muzafar Anim. The lease area falls in Survey of India Toposheet (OSM) No. **43J16, 43N4, 43K13, 43O1.**



2.3.1 Lease Hold Area

The proposed Limestone along with associated minor minerals mining project has lease area is 21.106 ha and the status of the land is given below:

Particular	Area (ha)
Govt. Waste Land (Siwai Chak Land)	21.106
Total	21.106

The general location and project site layout are given below:

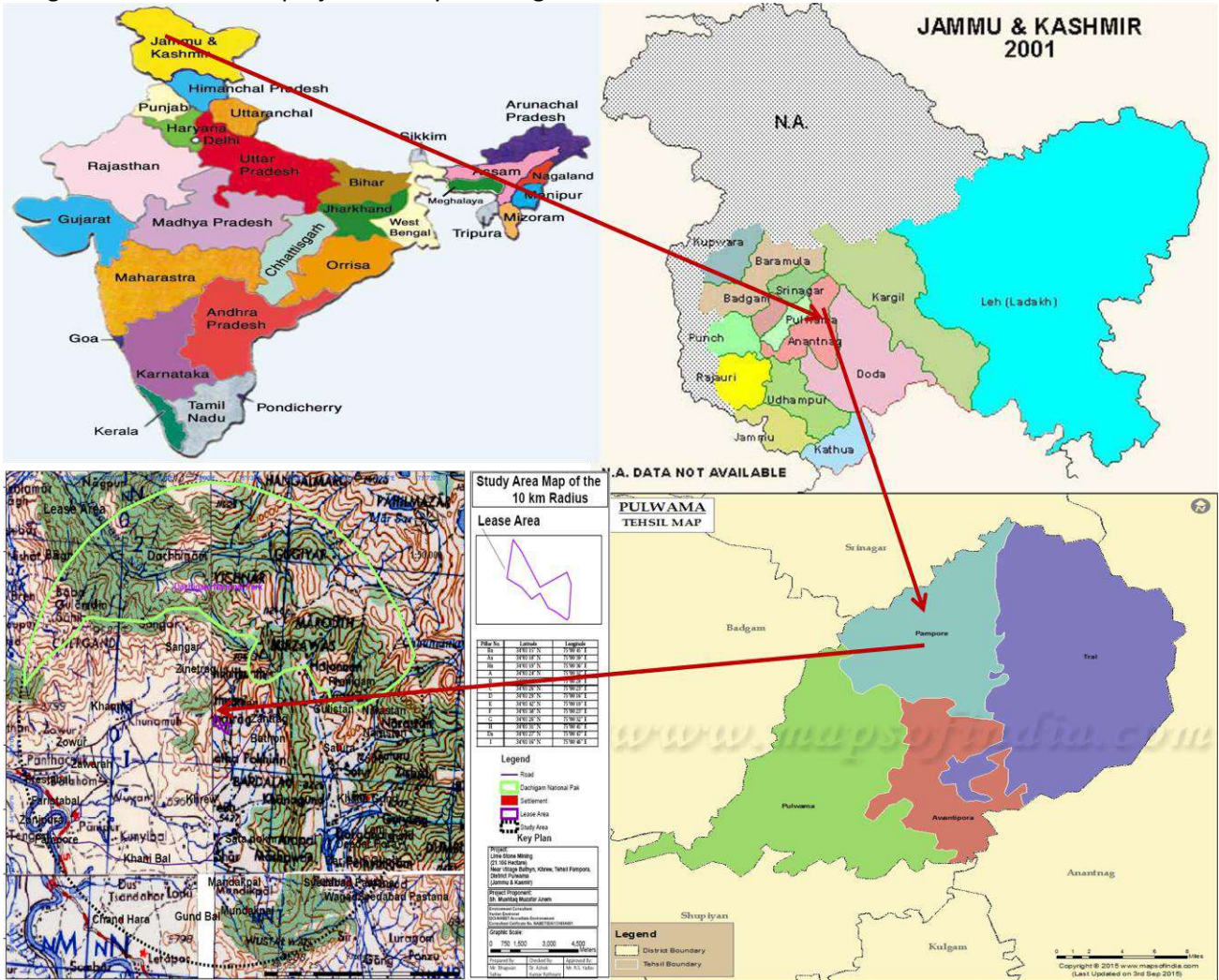


Figure 2.1: Location Map of the Project Site

2.3.2 Site History

Bathyn and Khrew Villages is located in Tehsil -Pampore, District- Pulwama (Jammu and Kashmir). It is situated ~12.00 Km away from district headquarter Pulwama and ~9.00 Km away from Sub-District Headquarter Pumpore. The topography of the area forming the hills of Pir Panjal Range is mountainous and rugged one. It is characterized by deep ravines having steep to moderate slopes. The area is marked by small ridges and depression. The ridges trending north and north-west.





Figure 2.2 Site visit Photograph.



Figure 2.2 (a) Google Image (Short View) of the Project Site

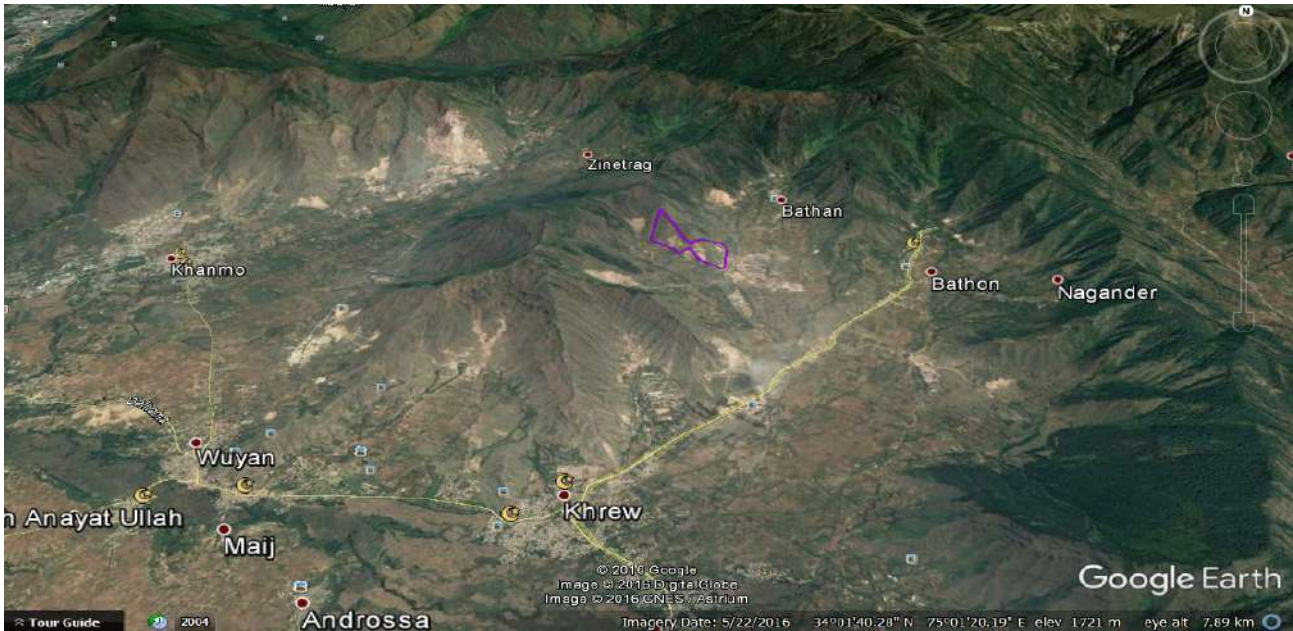


Figure 2.2(b) Google image (Long View) of the Project Site

2.4 MINING AREA

Lease was granted by Govt of Jammu and Kashmir, civil sect. industries and commerce Department in favor of Sh. Mushtaq Muzaffar Anim S/o Haji Mohd. Muzaffar Anim M/s Dawar Cement Pvt. Ltd. For mining of Lime stone. This land is free from the forest and NOC from the APCCF is attached as annexure-IV.

Table 2.1: Details of Mining

S. No.	Particulars	Details
1.	Method of Mining	Mechanized opencast method
2.	Geological Reserves	43222636 says 43.22 Million Tons
3.	Mineable Reserves	36983444 says 37 Million Tons
4.	Proposed Production	53,055 TPA(ROM)
5.	Elevation Range of the Mine Site	2242 m amsl to 1942 m amsl
6.	Bench Height	Bench Height: 3.0 m
7.	Bench Width	60 m
8.	Depth of pit	10m

Source: Approved Scheme of Mining with Progressive Mine Closure Plan, Page No. 6, 18

2.4.1 Topography of the Area

The topography of the area forming the hills of Pir Panjal Range is mountainous and rugged one. It is characterized by deep ravines having steep to moderate slopes. The area is marked by small ridges and depression. The ridges trending north and north-west. The general slop of the area is towards south and is abruptly ending towards south and is abruptly ending towards south & form the wide valley floor Bathyan valley with gradual rise towards north and further South- East. The highest level is at 2242m amsl towards The north west of the area at pillar E and the lowest level is at 2042m amsl towards south east of the area at pillar BX.

Source: Source: Approved Scheme of Mining with Progressive Mine Closure Plan, Page No. 56.

Geomorphology

Pulwama district is hilly and mountainous towards the northeast and southwest with broad intermountain



valley. The altitude of the hill ranges up to 3700 m amsl. The Valley area in the central part of the district has flat to mildly undulating topography with its elevation about 1600 m amsl and has an area about 6,000 sq. km. The Master slope in the area is towards north west. The district forms part of the Jhelum sub basin of Indus basin. River Jhelum is the major rivers with its tributaries drain the area. Three major tributaries of River Jhelum viz., Sasara, Rembaira and Romushi rivers drains the sloping land in the southwest and have wide channels. Soil in hilly areas is poor and fertile in plain areas. Productivity in higher ranges is poor while in central regions is fertile.

Source: CGWB Report March 2013.

2.4.2 Geology

The main geological formation in the area is upper Triassic limestone of cement grade limestone inter-bedded with quartzite bed. The limestone bands in the area trend 294° N to 342° N, amount of dip 30° to 46° and dip direction is 24° to 72° N. A lithological section of the area from top to bottom is given below -

Bed No.

- B0 Talus and scree
- B3 Grey to dark grey, fined grained, massive limestone with thin bands of bluish grey limestone.
- B2 Yellowish grey quartzite with reddish brown surface color.
- B1 Bluish grey limestone, fine grained and thickly average bedded

Bed No. B1: The surface of the litho unit is strained light brown, possibly due to leaching of overlying quartzite, which contains ferruginous material. This litho unit is exposed towards southern corner of area for strike length of 150m and the upper contact is exposed in the area. The length of band is 150m, width 105m and depth 130m. The limestone is bluish grey fine grained, thickly bedded.

Bed No. B2: Yellowish grey quartzite with reddish brown surface color. This litho unit contains ferruginous material and thin siliceous limestone stringers. The litho unit overlies B1. The litho unit is fine to medium grained, well jointed and massive. The lithology is easily distinguished with color variation and grain size.

Bed No. B3: Grey to dark grey, fine grained massive limestone. This litho unit lies over B2 and is exposed in strike, throughout the area and trending 307° N to 342° N amount of dip varies 30° to 45° and dip direction varies 37° N to 72° N. This litho unit is exposed along the bedding plan where it forms a dip-slope exposed all along this formation includes a zone where stringers of bluish grey limestone occur in it. The frequency of this stringers and the thickness of the zone is variable from place to place. The litho band is fine grained, heterogeneous in texture and prominently exposed in the entire area.

(Source: Source: Approved Scheme of Mining with Progressive Mine Closure Plan, Page No. 57.

2.4.2.1 Regional Geology

The rock formations of this district range from Cambrian to Quaternary. The brief generalized geological succession in the district is given below Stratigraphic Unit Lithology Thickness (m) App. Age Alluvium Clay, Silt and sand 15 Recent Upper Karewas Alternate greenish sandy and grey clay bed layers with calcareous Laminae 750 Plio-Pleistocene Second fluvio-glacial boulder bed 130 Lower Karewa Clay (bluish grey) & Conglomerates with coarse to fine sand (greenish in colour) alternate with grey sandy clays. Lignite and peat material 2000 Plio- Pleistocene First fluvio-glacial Boulder bed 200 Panjal Trap Agglomeratic slates, grits and effusive rocks Permo Carboniferous Zewan beds Shale, slates with quartzite and limestone. Cambro-Silurian Zewan beds, Panjal traps forming hilly and mountainous terrain of the district with hard formations of igneous and metamorphic rocks. The Karewas and alluvium of Quaternary and Tertiary age (Plio-Pleistocene) underlie the valley area and consists of alternate bands of sand, silt, gravel and clay, interspersed at two to three levels locally by glacial boulder beds. This formation is important from ground water point of view and sustains the water supply system in the area. This formation of Plio-Pleistocene age lies disconformably over the older rocks ranging in age from Cambrian to Triassic.

Source: http://cgwb.gov.in/District_Profile/JandK/pulwama.pdf



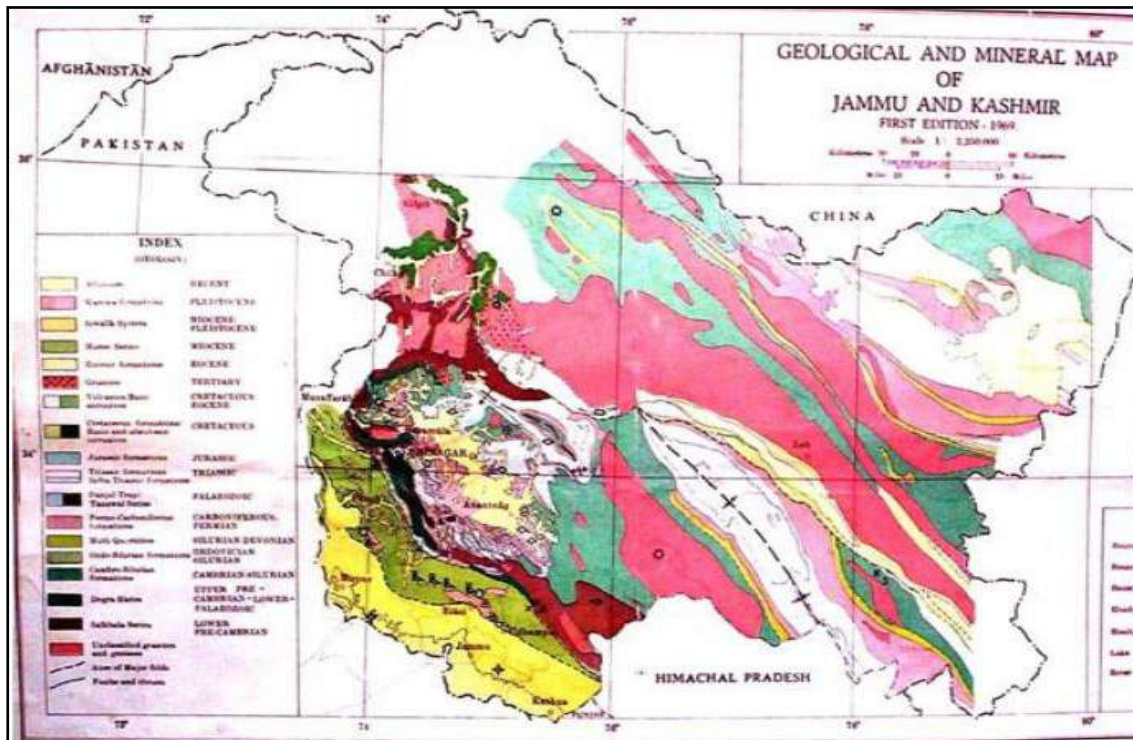


Figure 2.3: Geological and Mineral Map of Jammu and Kashmir (Source: GSI)

Geological Divisions of Jammu and Kashmir State:

- The Kashmir valley comprises of sedimentary, metamorphic and igneous rocks ranging in age from Salkhala (Precambrian) to Recent.
- Outer Hill Division covering Jammu comprises of Siwaliks, Murrees and Dogra Slates types of Geological Formations.
- Indus valley (Ladakh) Comprises Crystalline complex of rocks ranging in composition from sedimentary igneous and metamorphic in characteristics.

Mineral Bearing Area:

- Area of State : 222236 Sq kms
- Mountainous Area : 133346 Sq kms
- Mineral bearing Area : 13334 Sq kms
- Viability of the deposit : 60% of the deposits are commercially viable for Mining

2.4.3 Physiography and Drainage

The topography of the area forming the hills of Pir Panjal Range is mountainous and rugged one. It is characterized by deep ravines having steep to moderate slopes. The area is marked by small ridges and depression. The ridges trending north and north-west. The general slope of the area is towards south and is abruptly ending towards south and form the wide valley floor Bathyn valley with gradual rise towards north and further South-East. The highest level is at 2242m amsl towards the north west of the area at pillar E & the lowest level is at 2042 m RL towards south east of the area at pillar BX. No nallah exists within the lease area and rainy seasonal water flows from the upper reaches down the slope. Thinly populated villages exist outside the area which are located mostly on the gentle slope of the hills and in valley portion. Terraced farming for maize is carried out by the villagers on the slopes.

(Source: Source: Approved Scheme of Mining with Progressive Mine Closure Plan, Page No. 56)



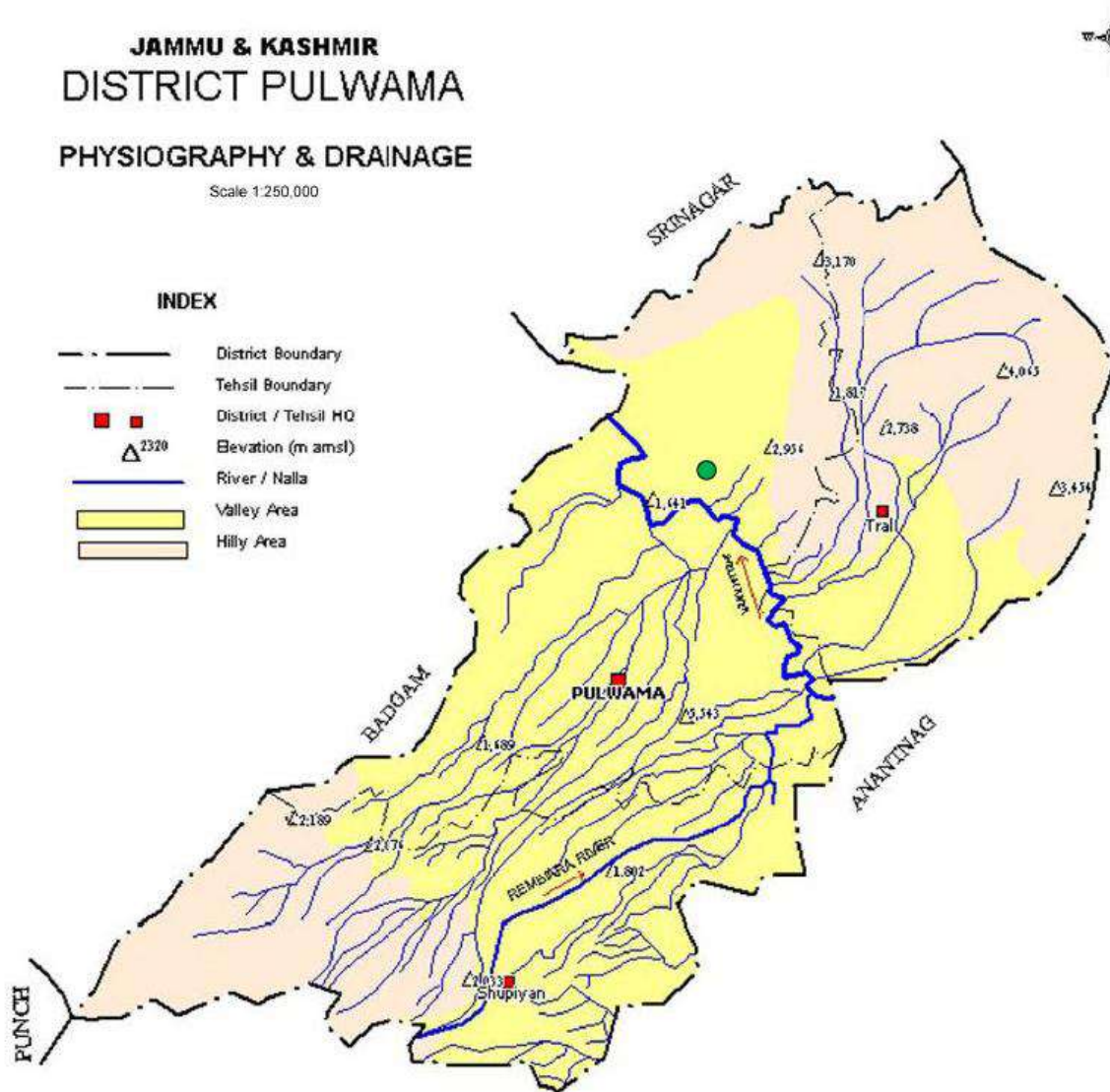


Figure 2.4: Physiographic and Drainage of Pulwama (J&K)

2.4.4 Hydrogeology

Hydro-geologically, the district is divided into two distinct and well-defined aquifer systems, viz., hard rock or fissured aquifer constituted mainly by semi-consolidated to consolidated rock units and soft sedimentary or porous aquifer constituted mainly by unconsolidated sediments. The fissured formation includes the semi-consolidated to consolidated rock formations exposed in the district are of igneous, metamorphic and sedimentary origin. These forms low and high hill ranges throughout the district. Fractured and jointed igneous, metamorphic rocks and the scree/talus deposits in the foothills form low to moderate potential aquifers with poor to moderate yields. Occurrence and movement of the ground water is mainly controlled by secondary porosity originated due to fracturing and faulting and related tectonic disturbances and weathering. Ground water oozes in the form of springs, seepages in the hilly areas and is utilizing for domestic purposes. There are numerous springs in the district generally concentrated along the contact zones and also in the hilly area. At some places shallow hand pumps and tube wells are constructed for ground water development. The yield of the shallow tube wells and hand pumps constructed along these secondary porous zones varies from 3-35 m³/hr.

The unconsolidated sediments comprising of fluvio-glacial and lacustrine deposits of Karewas and recent alluvium, terrace deposits and alluvial fan deposits constitute the porous aquifer system of the district. The



sediments consist of sand, gravel, cobbles, pebbles, boulders inter layered with thick clay beds forms the prolific aquifer system. Occurrence and movement of ground water is mainly controlled by the primary intergranular porosity in the soft sedimentary comprising of Quaternary alluvium and the Karewa formations. This unconsolidated sedimentary deposit forms multi-layer major aquifer system in the area. The sedimentary formation is +300m thick in the district as revealed by the study and ground water exploration carried out by CGWB. Ground water in the district occurs in phreatic and confined conditions in these formations. The depth of the tube wells ranges from 40 m at Ratnipora to 306 m at New Karewa. The water table occurs under artesian conditions at some areas. The yield of the tube wells ranges from 300 lpm at Hayatpora to 2980 lpm at Khonmoh for drawdowns ranges from 25 m to 0.41 m respectively. The depth to water level ranges from 0.50 m agl (artesian free flowing) at Tahab to 44.24 m at Hayatpora. The transmissivity values ranges from 63 m² /day to 100 m² / day.

Source: CGWB Report March 2013.

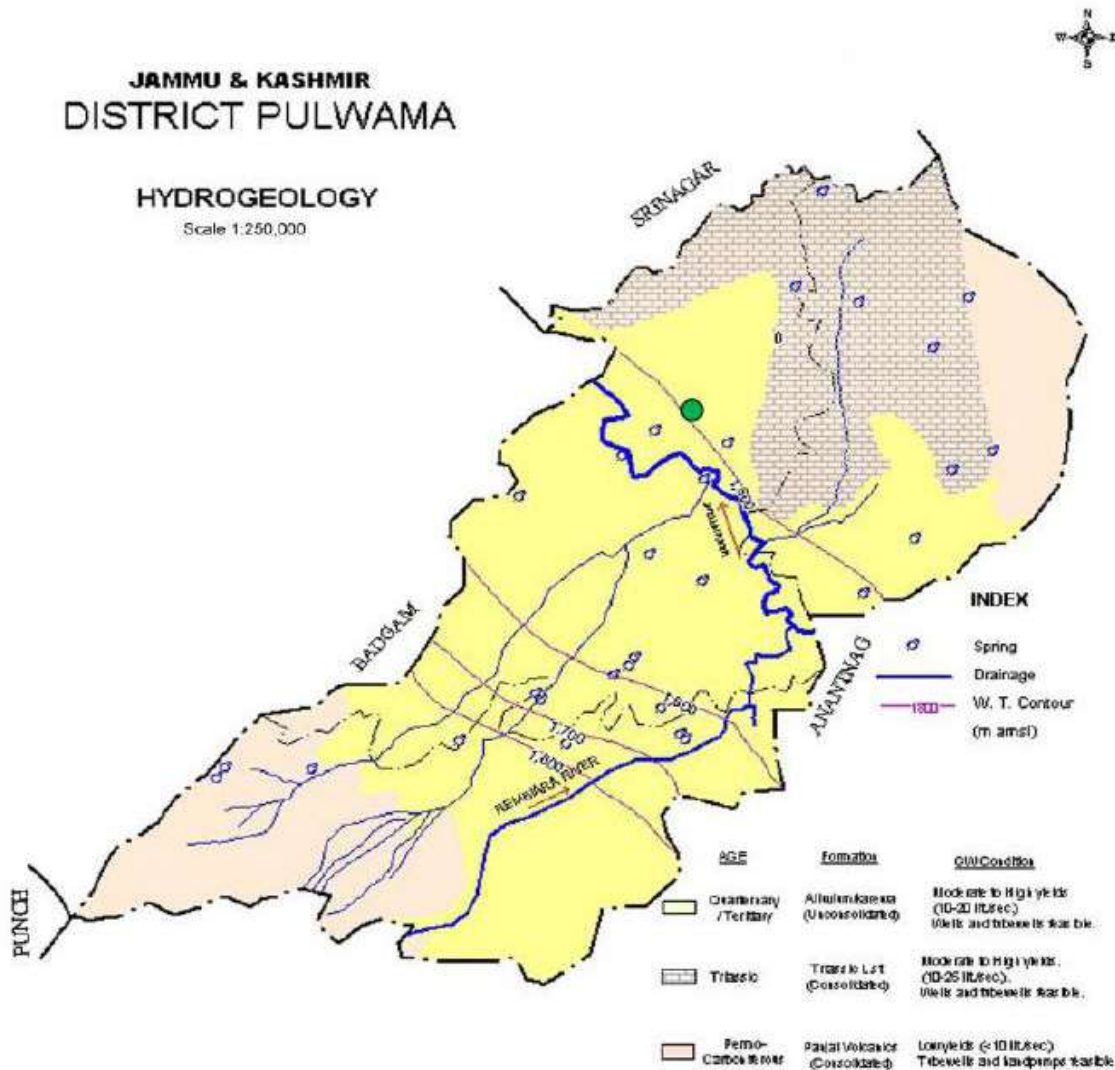


Figure 2.5: Hydrogeology of Pulwama (J&K)

2.4.5 Climate and Rainfall

The climate of the district is Temperate cum Mediterranean type. In the higher reaches the temperature remains cold throughout the year. Average minimum and maximum temperature varies from -5°C to 32°C. The winter season starts from the middle of the November and severe winter conditions continues till the middle of February/March. The district receives an average annual precipitation of about 556.5 mm in the



form of rain and snow for about 60 days.

Source: http://cgwb.gov.in/District_Profile/JandK/pulwama.pdf

2.5 SEISMICITY OF THE AREA

The Himalayan zone is divided into three seismic gaps – Kashmir gap, Central gap and Assam gap. The Jammu and Kashmir, Himachal Pradesh and Uttarakhand falls under Kashmir gap which is the highest earthquake prone seismic zone. Among the most notable are the Northwest Kashmir earthquake of 2005 (Mw 7.6); 2002 (Mw 6.4), Pattan earthquake of 1974 (Mw 7.4), Kangra earthquake of 1905 (Mw 7.8), 1885 Magnitude 7.5, 1842 Magnitude 7.5 Kashmir valley earthquake, 1505 Magnitude 7.6 earthquake of Kashmir, 1555 magnitude more than 8, etc. According to the seismic zonation map, the region under study falls in seismic zones IV and V. A recent seismic hazard analysis of Northwest Himalayan region has categorized Jammu region under high hazard zone (Mahajan et al., 2007). The entire study area is flanked by a number of faults and thrusts some of them being considered very active (e. g., Main Boundary Thrust (MBT) and Murree thrust). Most of the earthquakes are generated by the fault movements (Bolt 1999) and in Jammu and Kashmir region there are parallel faults trending northwest to south east.

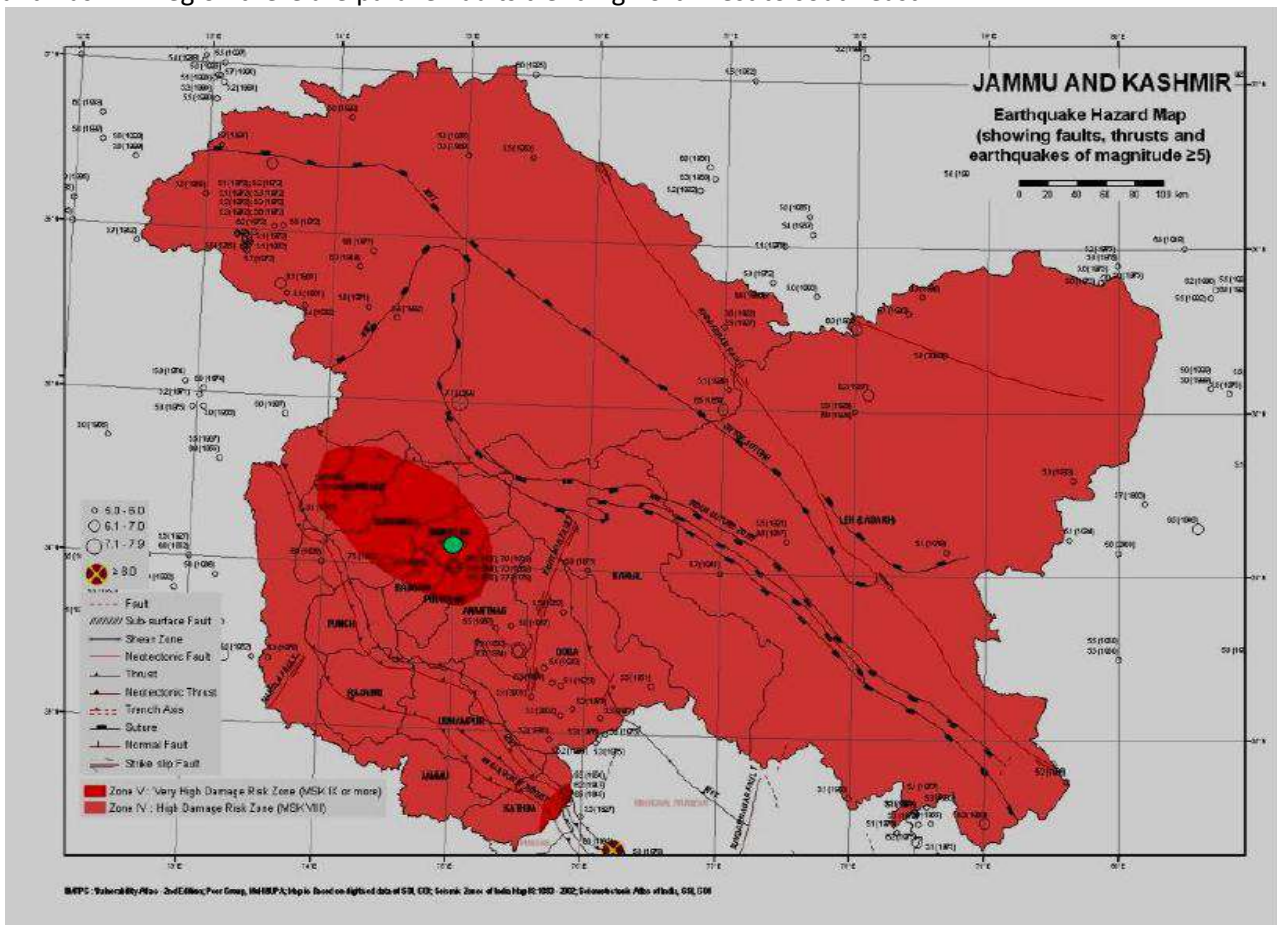


Figure 2.6: Map showing earthquake hazard distribution (Source: BMTPC)

Recent Hazard

i. Snow Blizzard at Waltengu Nad (Kulgam district) February, 2005

On 18th Feb 2005 a snow blizzard occurred in villages Waltengu Nad, Pachgam and Nigeenpora affecting 128 families consisting of 618 souls. During the incident 175 lives (54 men, 48 women and 73 children) were lost. In many cases full families were wiped out. 183 sheep/goats, 308 cows, 54 buffaloes and 5 horses perished.

ii. Kashmir Earthquake, October, 2005

On 8th October, 2005 a devastating earthquake of magnitude 7.6 resulted in 953 deaths and 418 injuries in Jammu & Kashmir (also more than 80,000 deaths in PoK). This was one of the deadliest earthquakes in the sub-continent. 23,782 houses were fully damaged in the quake in the State. 40.3% of the deaths comprised children below 10 years of age, thereby depicting their vulnerability and signifying the importance of school safety. The presence of Army in the affected areas proved to be a great healer for the people, as Army was



among the first responders who, with the help of IAF, managed to airlift hundreds of injured people to different hospitals in Srinagar and Baramulla.

iii. Leh Cloudburst and Flash floods, August 2010

On the intervening night of August 5 - 6, 2010, Leh witnessed a devastating cloudburst followed by flashfloods. The unprecedented event resulted in the death of over 250 people and damage worth crores of rupees. The areas in and around Leh, especially Choglamsar, where people had constructed houses along the dry water course had no idea that the stream could get flooded and wash away everything whatever came in its way.

2.6 EXPLORATION AND RESERVES

Category wise (Proved, Probable & Possible reserves estimated in the earlier mining plan with grade).

Reserves estimated in Approved Mining Plan. The quantity of Geological Reserves estimated in approved mining plan is given below.

CATEGORY	MINERAL	MILLION TONNES
Proved	Limestone	31.205282
Probable	Limestone	5.778162
Possible	Limestone	6.239192
Geological Reserves=43.222636 Million Tons		
Total Mineable Reserves= 36.983444 Million Tons		

(Source: Source: Approved Scheme of Mining with Progressive Mine Closure Plan, Page No. 6)

2.6.1 Life of Mine

As per Approved mining Scheme the life of mine will be more than 340 years.

2.6.2 Year wise production

Year	ROM Limestone (Tons)	Saleable Ore (Tons)
2013-14	51438	51438
2014-15	53055	53055
2015-16	50760	50760
2016-17	50828	50828
2017-18	51165	51165
Total	257246	257246

(Source: Source: Approved Scheme of Mining with Progressive Mine Closure Plan, Page No. 23)

2.7 MINING METHODOLOGY

Mining will be mechanized. As the benches reach their ultimate pit limit, the plantation will be undertaken over the benches. The slope of the mining faces will be kept 70° to 75°. The proposed mining will be carried out manually with drilling and blasting. Big boulders of limestone will be broken manually with the help of hammer. Mining faces will open from the top level from the existing haul road. The production of limestone will be achieved through the continuation of extraction of limestone from existing pits on top at RL 2059 to RL 2062. The production of limestone shall be achieved through the opening and advancement of benches from RL 2062 downwards for six benches up to RL 2044m, 6600sqm area shall be covered by mining faces & it will be in between the local coordinates N 2200 to N 2400 & E 1500 to E 1645. Mining shall be carried out in gullet like manner. The mining faces will open from the existing haul roads and advance towards the north & east and north east directions. Waiting points will be provided at each turning of ensure safe passing of tippers. The soil will be spread over the completed benches for the purpose of plantation. During ensuring five years benches 2062 m RL will reach their ultimate pit limit and plantation will be undertaken over the benches. Local species will be planted over the benches. Considering future development in more years to come these mining faces shall not reach ultimate pit limit last bench on top at RL 2236 does not reach the limit.



Length of mining faces will vary from 14m to 170 m width of working benches will vary from 5m to 8m advancement of benches will vary from 4m to 67 m height of the benches will be 3m & slope of the faces shall be kept 70° to 75°. The ultimate width and height of the completed benches will be kept 3.0m ultimate pit slope will be maintained 45°.

(Source: Source: Approved Scheme of Mining with Progressive Mine Closure Plan, Page No. 23)

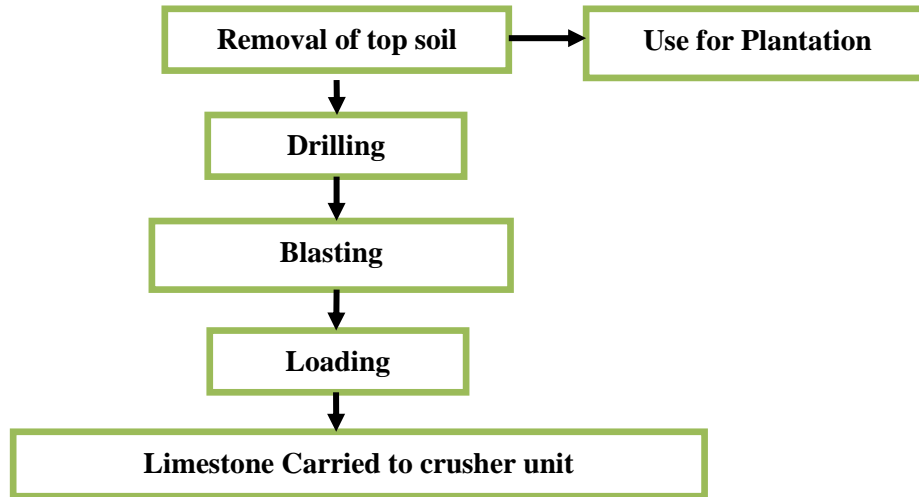


Figure.2.7: Process Flow Chart of Limestone Mining

2.7.1 Extent of Mechanization

The machineries required for mining will be arranged on hired basis initially. The machinery required will be as follows:

Table 2.2: Details of Proposed Mining Machinery

S. No.	Name of equipment	Make	Capacity	Quantity
1.	Jack Hammers	Atlas Copco	300 cfm	4
2.	Pneumatic air compressor	Atlas Copco	Above 90 cfm	1
3.	Pneumatic Hose pipe	Dunlop	3/4"	100mts
4.	Tippers/Trucks	6	10 tons	TATA (6 wheel drive)
5.	Drill Rods		0.65 cm Length 1.0 m length 1.5 m length	12
6.	Loading equipment	Loading shall be manual, therefore, no loading equipment is proposed.		

(Source: Source: Approved Scheme of Mining with Progressive Mine Closure Plan, Page No. 30, 62)

2.7.2 Blasting

Mine will be worked manually and blasting will be limited to short hole by Jack hammer (32 mm diameter) Initially sub benches of 1.5m height shall be developed which will be latter converted in to 3m height benches. Hole depth 1.5 m burden 0.90m yield per hole-4 tons excavation required per day (considering 300 working days in a year) = 270 tons per day. Thus number of holes to be blasted per day is 65-70 needing 70kgs of explosive. The lessee has obtained explosive license from controller explosive.

(Source: Source: Approved Scheme of Mining with Progressive Mine Closure Plan, Page No. 31)

2.7.3 Storage of Explosive

The explosive will be supplied by the authorized contractor at the blasting site at the time of blasting. The explosive will be directly used, so no storage of explosive is proposed. All statutory provisions as under the Explosive Act and modifications thereof are proposed shall be followed.

2.8 LOADING AND TRANSPORTATION

The mineral limestone shall be carried in hired trucks from either from either mine/benches or stacking yard to its final destination.

(Source: Source: Approved Scheme of Mining with Progressive Mine Closure Plan, Page No. 31)

2.9 Handling of waste/ sub grade material

No waste or sub grade mineral is expected as limestone is free of over burden, 5% waste in the form of khakh-bajri will be generated which shall be used as filling material.

(Source: Source: Approved Scheme of Mining with Progressive Mine Closure Plan, Page No. 31)

2.10 USE OF MINERAL

The limestone from the lease area is used in cement manufacturing.

2.11 LAND USE PATTERN OF MINING AREA AT VARIOUS STAGES

Table 2.3: Land Use Pattern

S. No.	Particulars	As on Date	End of 5 th Year
1	Mining	0.42	0.63
2	Road/ buildings/ Infrastructure	0.62	0.5
3	Channels and trial pits	0.113	0.113
4	Plantation	0.327	0.432
5	Retaining wall	-	0.03
6	Balanced undisturbed land	19.62	19.401
Total		21.106	21.106

(Source: Source: Approved Scheme of Mining with Progressive Mine Closure Plan, Page No. 41)

2.12 UTILITIES AND SITE FACILITIES

2.12.1 Water Requirement

Total water requirement for the project will be 20.0 KLD which will be used for domestic as well as dust suppression purpose and sourced from nearby village.

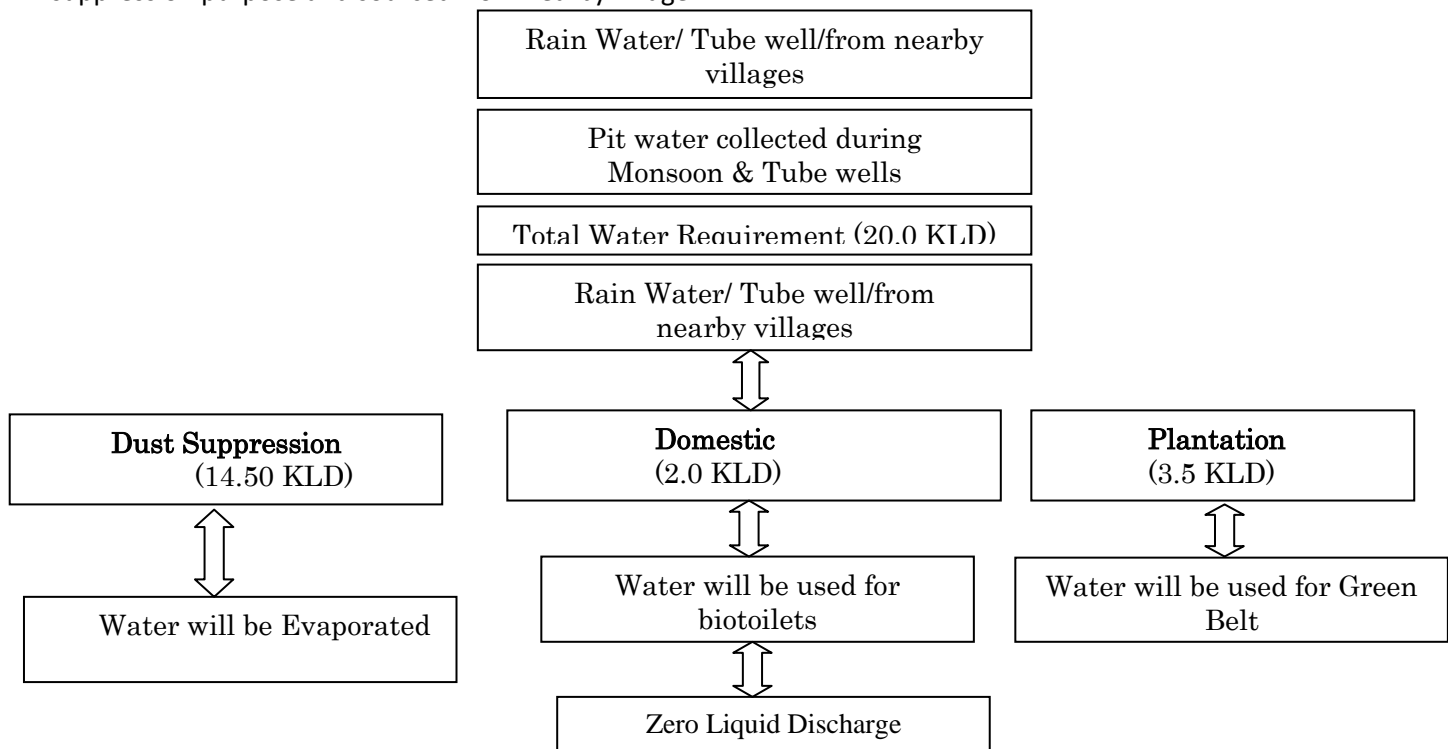


Figure 2.8: Water Balance

Note: Water requirement is fulfilled through hired tankers. Therefore there is no need of clearance from the competent authority as there will be no ground water withdrawal by the project proponent.

2.12.2 Man Power

Table 2.4: Man Power Requirement

S. No.	Category of Manpower	Proposed Manpower Requirement
1.	Mining Enginner Full time	1
2.	Mining Engineer	1
3.	Mining Geologist	1
4.	Foreman	1
5.	Blaster	2
6.	Skilled /unskilled workers	29
7.	Unskilled Labours	4
Total		39

(Source: Source: Approved Scheme of Mining with Progressive Mine Closure Plan, Page No. 33)

Most of the workers will be from nearby villages. With increase in production additional man power will be required.

2.12.3 Site Services

The workers are mostly locals living in the close proximity of area and will work in shifts during day time only thus there is no requirement of major infrastructural facilities at the site. The following infrastructure facilities will be made available for the workers.

- (i) **Mine Office:** Temporary office is proposed is proposed at mine site.
- (ii) **Rest shelter:** Temporary rest shelter has been provided near mining lease site.
- (iii) **First Aid:** First aid facility will be available at office.
- (iv) **Water Supply:** Water is being supplied from nearby villages for drinking purpose.
- (vi) **Urinals:** At the mining lease site urinal and latrine are proposed.

2.12.4 Power

The electric power will not be use for the process of mining. Only HSD Fuel will be required for operating machineries. The operation will be done in one shift therefore required electricity for lighting arrangement will be made as per Regulation 146 of MMR 1961.

2.13 STATUTORY OBLIGATIONS AND LITIGATION

2.13.1 Litigation

The Committee noted that it is a violation case as the PP had started production of limestone without obtaining requisite prior environmental clearance since 2008 to 2013. As per the PFR, the PP had mined out 1,17,812 tons of limestone. PP informed that the mine is closed since June 2013.

2.14 SUMMARY

The proposed project is for mining of Lime Stone over an area of **21.106 Ha.** near Chakdura, Bathyn and Khrew, Tehsil -Pampore , District- Pulwama (Jammu and Kashmir) with production capacity of **53,055 TPA** Tons of Lime Stone . Climatically area falls in temperate zones with pleasant summer and extremely cold in winter. The project site falls under seismic **zone VI**. The total geological reserve is 43.222636 Million Tons and total mineable reserve is 36.983444 Million Tons . Lime Stone will be transported by trucks. It is widely used in construction, buildings, bridges and other infrastructure. Total water requirement for the project is **20 KLD**. Total man power requirement for the project is **39**. The site facilities like canteen, rest-shelter, first aid facility, water and electricity supply etc. will be provided as per requirement.



CHAPTER-3

DESCRIPTION OF THE ENVIRONMENT

3.0 Study area and period

The main objectives of describing the environment, which may be potentially affected, are to assess present environmental quality and the environmental impacts and to identify environmentally significant factors that could preclude Mine development. Here we are discussing about the present scenario of the study area with reference to the prominent environmental attributes. The study area covers 10 Km radius of the mine lease area. Baseline data has been collected out during the **Pre Monsoon i.e. 1st March to May 2016 by M/s. Vardan EnviroLab, Gurgaon {MoEF&CC Recognised Laboratory vide S.O. 1783 dated 30th June 2015, NABL Certificate No. T-2629** (Certificates of NABL and MoEF&CC are enclosed as **annexure V**) in accordance with the Guidelines for EIA issued by the Ministry of Environment Forests and Climate Change, Govt. of India and CPCB, New Delhi. The impact identification always commences with the collection of baseline data such as Ambient Air Quality, Micro-Meteorology, Ground and Surface Water Quality, Noise levels, Soil Quality, Land use pattern, Biological Environment and Socio-economic aspects, Solid and Hazardous waste, Risk Assessment, Geology and Hydrology within the study zone of 10 Km. radius. Long term meteorological data recorded at the nearest IMD station, Shrinagar was also collected. Micrometeorological data at site was recorded using automatic weather station. Apart from these, secondary data have been collected from Census Handbook, Revenue Records, Zoological survey of India, Botanical Survey of India, Geological Survey of India, Statistical Department, Soil Survey and Land use Organization, District Industries Centre, Regional Forest Department, Central Ground Water Authority, etc. The generation of primary data as well as collection of secondary data and information from the site and surroundings was carried out during study. The EIA study is being done for the Mine Lease (core zone) and area within 10 Km distance from mine lease boundary (buffer zone), both of which together comprise the study area. The following data, through field survey and other sources, has been collected by **M/s Vardan Environet**, for preparing the EIA/EMP for the proposed mining area with related facilities.

- Physical environment (Air, Water, Soil and Noise) baseline data.
- Relevant meteorological data, for previous decades from Indian Meteorological Department (IMD) and primary data.
- Land use pattern within core zone and buffer zone (10 Km distance around the core zone) based on Survey of India Toposheet map, ground truth and satellite image.
- Identification of water bodies, hills, roads etc. within 10 Km radius.
- Eco-sensitive places, sanctuaries, biosphere reserves within 10 Km radius.
- Religious places / historical monuments and tourist places within 10 Km radius.
- Details of fauna and flora within a distance of 10 Km from the project site and information about forests, if any.
- Demography and Socio-economic based on last available Census data for entire study area.
- Major industries within 10 Km radius.
- Study of present environmental protection and mitigation measures in nearby operating similar projects, if any.

3.1 COMPONENT

LAND ENVIRONMENT

Area statistics of land use classes has been generated within 10 Km radius of mine lease area (Core zone and Buffer zone) and given in **Table 3.1**.

3.1.1 Data Used

Indian Remote Sensing satellite IRS-P6, LISS III, multi-spectral digital data has been used for the preparation of land use/ land cover map of present study. Survey of India reference map on 1:50,000 scales have been used for the preparation of base map and geometric correction of satellite data. Ground truth has been carried out to validate the interpretation accuracy and reliability of remotely sensed data, by enabling verification of the interpreted details and by supplementing with the information, which cannot be obtained directly on satellite imagery.



3.1.2 Methodology

The methodology used for the study consists of following components.

(i) Base Map Preparation

Base map was prepared using Survey of India reference map on 1:50,000 scale. Interpreted thematic details were transferred on the base map. Besides, other supporting data like project reports and statistical data published by various Government departments have also been used.

(ii) Ground Truth Data Collection

Ground data on geo-environmental components of the study area was collected for verification of information about the different features on the study areas, which are responsible for the occurrence of specific spectral reflectance behavioral patterns. During the ground truth detailed information on agricultural practices, wastelands, mining, industrial area etc. were collected along with other land features.

(iii) Interpretation of Remote Sensing Data

A hybrid technique has been used *i.e.* visual interpretation and digital processing for identification of different land use /land cover classes based on the image characteristics like tone, size, shape, pattern, texture, location and association etc. An image interpretation key was developed based on such image characteristics, which enables interpretation of satellite images for land use/land cover features. Further, the land use / land cover and other baseline layers was put in GIS database for integration, analysis, statistics generation and final out in the form of land use land cover map.

3.1.3 Observation of Land Use Study

In the present study, both digital image processing and using visual interpretation technique were used to generate output of Land use / Land cover map of study area on 1: 50,000 scale (as shown in **Figure 3.1**). A standard False Colour Composite (FCC) image has also been generated on the same scale (**Figure 3.2**). Land use Pattern of the Study Area (10 Km distance from the mine site).

Table 3.1 Land Use Pattern of the Study Area

Land use	Area (Hectares)	% Area
Water Body	140.22	0.41
Open forest	8502.21	25.02
Dense Forest	9000.95	26.49
Open Scrub	4900.95	14.42
Grassland	5293.3	15.58
Agricultural Land	4645.17	13.67
Fallow Land	1359.45	4.00
Settlement	135.25	0.40
Total Area	33977.5	100.00

Source: Land use map

3.1.4 Topography

The topography of the area forming the hills of Pir Panjal Range is mountainous and rugged one. It is characterized by deep ravines having steep to moderate slopes. The area is marked by small ridges and depression. The ridges trending north and north-west. The general slope of the area is towards south and is abruptly ending towards south and form the wide valley floor Bathyn valley with gradual rise towards north and further South-East. The highest level is at 2242m amsl towards the north west of the area at pillar E & the lowest level is at 2042m amsl towards south east of the area at pillar BX. No nallah exists within the lease area and rainy seasonal water flows from the upper reaches down the slope. Thinly populated villages exist outside the area which are located mostly on the gentle slope of the hills and in valley portion. Terraced farming for maize is carried out by the villagers on the slopes.

3.1.5 Drainage

Drainage of the study area has already been discussed in **Chapter-2**.



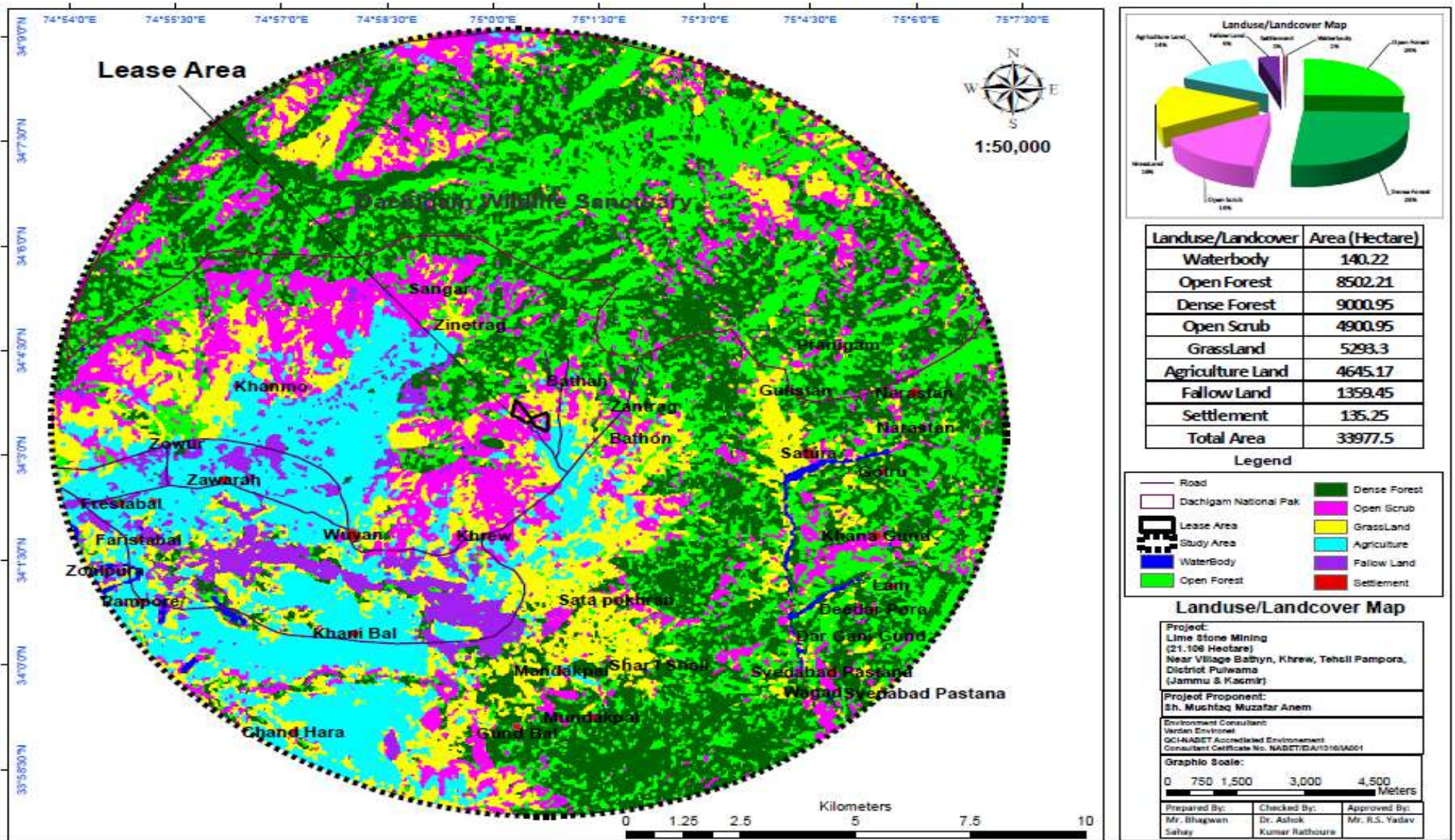


Figure 3.1: Land Use / Land Cover Pattern of the Study Area (10 Km Radius from the Mine Site)



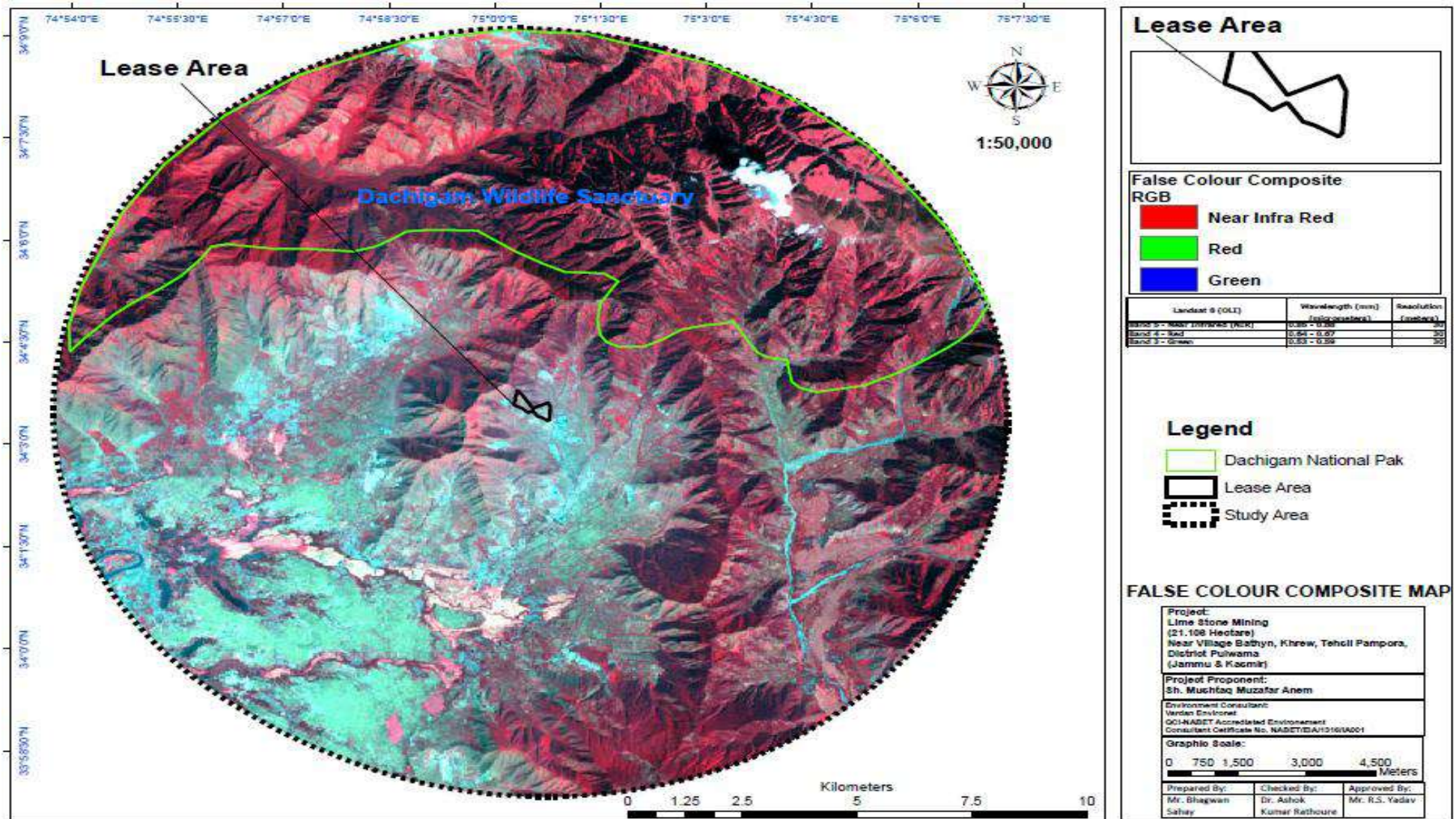


Figure 3.2: FCC Map of the Study Area (10 Km Radius from the Mine Site)



3.2 SEISMICITY OF THE AREA

The seismicity of the area has been discussed in the details in Chapter 2 of this EIA/EMP report.

3.3 METEOROLOGY

The meteorology of the project area plays very important role in dispersion of pollutants and buildup of pollution within the atmosphere. In the present study, one season (March 2016 – May 2016) meteorological data has been taken to find the dispersion of pollutant concentration. The mixing height for study period, which is an important parameter to express the dispersive potential of atmosphere, has been taken from the atlas of hourly mixing height and assimilative capacity of atmosphere in India (Attri et al., 2008).

3.3.1 Climate of the Area

The climate of district can be classified as subtropical monsoon, mild and dry winter, hot summer and sub-humid which is mainly dry with hot summer and cold winter except during monsoon season when moist air of oceanic origin penetrates into the district. There are four seasons in a year. The hot weather season starts from mid March to last week of the June followed by the southwest monsoon which lasts up to September. The transition period from September to November forms the post monsoon season. The winter season starts late in November and remains up to first week of March.

3.3.2 Rainfall of the Area

The normal annual rainfall of the district, based on the record for the period 2009-2013 is **686.1-1367.7 mm**. About 88.5% of the annual rainfall is recorded during the southwest monsoon from June-September. August is the wettest month of the year with 1566.9 mm rainfall during this period.

Table 3.2 Monthly Average Rainfalls for Year 2009-2013 (mm)

Months/Year	2009	2010	2011	2012	2013
January	3.5	7	2.8	9.0	76.0
February	20.5	27	19.5	0	142.4
March	4.0	0	14.2	2.0	9.9
April	20	0	4.9	12.1	1.4
May	0	8.3	55.4	0.3	17.7
June	7	25.4	303.5	4.7	330.6
July	159	459.4	225.9	179.3	121.2
August	220	357.1	228.5	347	414.3
September	308	437.1	65.9	122	98.3
October	6	11	0	0	15.7
November	0	6.7	0	0	7.8
December	0	28.7	1.6	9.7	23.9
Total Rainfall	748	1367.7	922.2	686.1	1259.2

As we can see that the average annual rainfall of the district from the year 2009-2013 shows a variable pattern and will make a curved graph with decreasing and increasing heights.

3.3.3 Meteorological Status at the Project Site

Meteorological station was set-up at site to record surface meteorological parameter during study period; Pre Monsoon Season, 2016.

Climatology during study period (1st March, 2016 to May, 2016)

- Maximum Temperature : 30°C
- Minimum Temperature : 9.0°C
- Relative humidity (Maximum) : 64%
- Wind speed (Maximum) : 5.1 m/s



Table 3.3: Meteorological Condition of the Study Area

Month	Temperature °C		Relative Humidity %		Wind Speed (Km/Hr)	
	Min	Max	Min	Max	Min	Max
March 2016	9.0	20.25	27.0	96.0	0	12.2
April, 2016	14.0	19.00	32.0	95.0	0	16.1
May, 2016	16.0	30.0	20.0	94.0	0	18.2

3.3.4 Relative Humidity

The humidity is highest in July, August and September. The annual mean relative humidity of 30 years is furnished in **Table 3.4**.

Table 3.4: Monthly Average Relative Humidity (%)

Months	Min	Max
January	48	75
February	44	70
March	34	61
April	25	44
May	27	42
June	38	55
July	64	75
August	69	80
September	56	71
October	40	61
November	41	63
December	47	72
Average	44	64

3.3.5 Wind Speed / Wind Rose Diagram

Wind speed and wind direction data recorded during the study period is useful in identifying the influence of meteorology on the air quality of the area. Based on the collected meteorological data, relative percentage frequencies of different wind directions are calculated and plotted as wind roses of Sixteen directions viz., N, NNE, NE, ENE, E, ESE, SE, SSE, S, SSW, SW, WSW, W, WNW, NW and NNW for twenty four hour duration respectively. Maximum and minimum temperatures including percentage relative humidity were recorded simultaneously. The average wind speed recorded was 0.8 m/s. wind rose diagram from the monitored data shows that the predominant wind direction during the study period was mainly from SW to NE. The Wind rose diagram has been shown in **Figure 3.3**

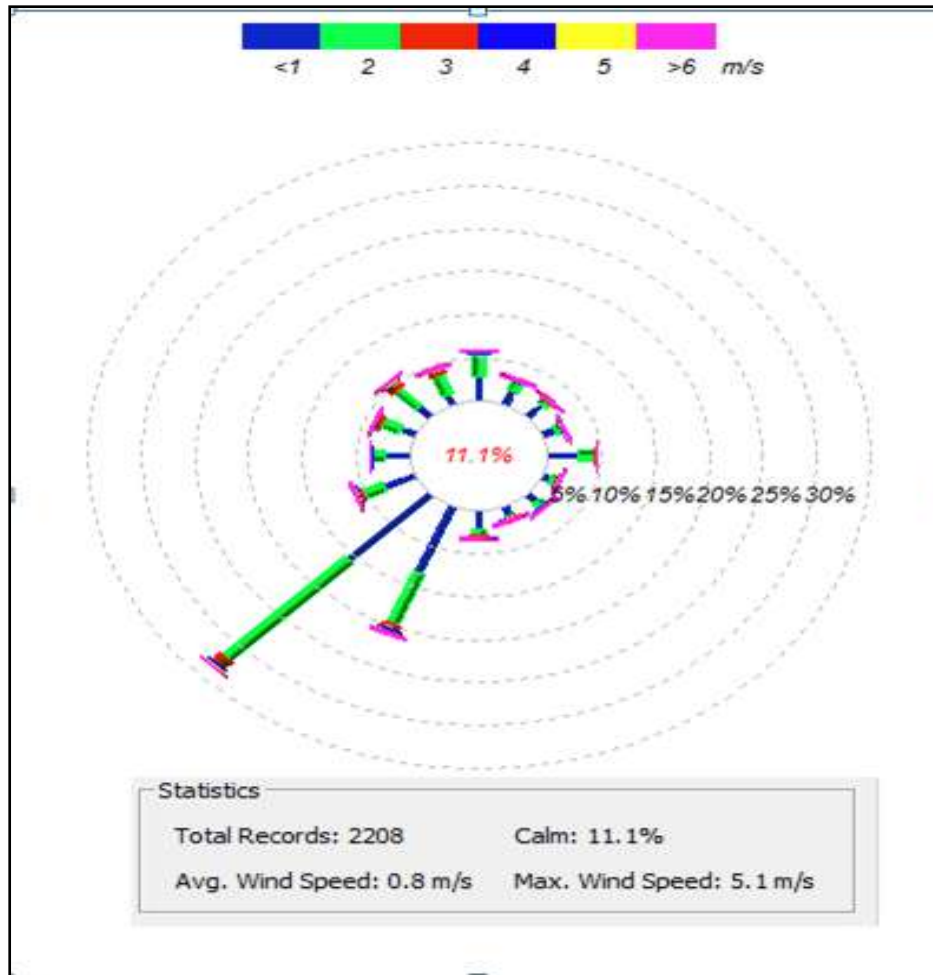


Figure 3.3: Wind Rose Diagram of Study Area

3.4 AMBIENT AIR QUALITY

The ambient air quality with respect to the study area of 10 Km radius around the lease area forms the baseline information. The various sources of air pollution in the region are dust rising from unpaved roads, domestic fuel burning, vehicular traffic, agricultural activities, other industries, etc. The prime objective of baseline air quality monitoring is to assess existing air quality of the area. This will also be useful in assessing the conformity to standards of the ambient air quality during the operations.

3.4.1 Selection of Sampling Station

The baseline status of the ambient air quality has been assessed through scientifically designed Ambient Air Quality Network. The design of monitoring network in the air quality surveillance program has been based on the following considerations:

- Meteorological conditions (wind direction and wind speed),
- Representative of likely affected area, school, village, hospitals etc.
- Representative of regional background air quality for obtaining baseline status,
- Topography of the study area
- Accessibility and availability of the infrastructure, Such as historical monument.
- Representative of sensitive receptor, Such as water body, forest etc.

As per ToR condition which was issued on date 22.01.2016 by MoEF&CC, GOI vide letter no. J-11015/324/2013-IA.II (M) (Pt.) Keeping in view above mentioned points, 7 Nos. of Ambient Air Quality Monitoring Stations were established within the study area. The sampling locations and their distances are shown in **Table 3.6** and in **Figure 3.4**. It can be observed from the wind rose diagram, that the predominant wind direction during the study period was from West. Villages/locations have been selected in downwind direction as well as in the upwind direction for AAQ monitoring from the proposed activity site.

Table 3.5 Ambient Air Quality Monitoring Sampling Stations

Stations	Sampling Locations	Coordinates		Aerial Distance (Km) and Direction From Mine Site	Sampling Location Criteria
		Latitude	Longitude		
A1	Near Project Site	34°3'21.821"N	75°0'37.957"E	Mine Site	<ul style="list-style-type: none"> Falls in Upwind direction of 1st pre-dominant wind direction.
A2	Near Village Bathan	34°3'58.56"N	75°1'10.204"E	1 Km, N	<ul style="list-style-type: none"> Falls in Downwind direction of 2nd pre-dominant wind direction. Densely populated area (Total Population as per Census, 2011 is 862).
A3	Near Villag-Pranigam	75°4'4.542"E	75°4'4.542"E	5.1Km, NE	<ul style="list-style-type: none"> Falls in Downwind of 1st pre-dominant wind direction. Densely populated area (Total Population as per Census, 2011 is 870).
A4	Near Village Zinetrag	34°4'46.086"N	74°59'40.977"E	2.8 Km, NW	<ul style="list-style-type: none"> Falls in Downwind direction of pre-dominant wind direction. Densely populated area (Total Population as per Census, 2011 is 616).
A5	Near Village-Satura	34°2'57.272"N	75°4'27.104"E	5.7 Km, NE	<ul style="list-style-type: none"> Falls in Crosswind direction of predominant direction Densely populated area (Total Population as per Census, 2011 is 2920).
A6	Near Village SataPokhran	34°0'48.896"N	75°1'45.649"E	5 Km, SE	<ul style="list-style-type: none"> Falls in Cross wind direction of predominant direction Densely populated area (Total Population as



					per Census, 2011 is 1342).
A7	Near Village- Wuyan	34°1'46.708"N	74°57'58.798" E	5 Km, SW	<ul style="list-style-type: none"> Falls in Upwind direction of 2nd predominant wind direction. Densely populated area (Total Population as per Census, 2011 is 5874).

(Source: SOI Topo-sheet and Field Visit)

3.4.2 Baseline Data

Ambient air monitoring at 07 locations was carried out during 1st March to May 2016 in the study area to assess the ambient air quality at the source. Major air pollutants viz. Particulate Matter (PM₁₀), Sulphur Dioxide (SO₂), Nitrogen Dioxide (NO₂), representing the basic air quality in the region were identified for Ambient Air Quality Monitoring (AAQM). The ambient air quality results are given in **Table 3.7 and 3.8** for each location.

3.4.2.1 Sampling and Analytical Techniques and Instruments Used for Sampling

The various instruments used and technique adopted for sampling is given in table below:

Table 3.6: Testing Procedure Used for Determining Various Air Quality Parameters

Parameters	Testing Procedure
PM ₁₀	Gravimetric Method by using Repairable particulate matter sampler "Repairable Dust Sampler" (RDS).
PM _{2.5}	Cyclonic Method by using Fine particulate sampler.
NO ₂	Absorption in diluted NaOH and then estimated calorimetrically with sulphanilamide and N (I-Nephthyle) Ethylene diamine Dihydrochloride and Hydrogen Peroxide (IS: 5182 1975, Part-VI).
SO ₂	Absorption in Sodium Tetra Chloromercurate followed by Colorimetric estimation using P-Rosaniline hydrochloride and Formaldehyde (IS: 5182 Part – II, 2001).
Free Silica	Colorimetric method by Spectrophotometer

Table 3.7: Ambient Air Quality Monitoring Results in µg/m³ (March 2016 to May2016)

Station	PM ₁₀		PM _{2.5}		SO ₂		NO ₂	
	Min	Max	Min	Max	Min	Max	Min	Max
A1	45.3	59.8	24.2	35.2	6	10.6	13.1	23.8
A2	46.4	56	23.6	33.4	6.1	10.6	14	23.7
A3	46.4	57.7	24.6	34.1	6.1	9.9	14	24.9
A4	46.4	57.5	24.2	32.7	6	9.8	14.8	29
A5	46.1	76.3	24.2	38.8	6.1	9.9	15.3	26.8
A6	53.8	74.9	44.8	56.3	6	10.1	14.2	22.1
A7	45.2	55.8	24.1	33.5	6.7	9.8	13.7	22.4

Table 3.8: Mineralogical Composition of free Silica in PM₁₀ *

Station	PM ₁₀ (µg/m ³)	Free Silica (% in PM ₁₀)	Ca (µg/m ³)	Mg (µg/m ³)	Ni (ng/m ³)	Pb (µg/m ³)
A1	50.8	2.7	0.86	0.41	<0.5	0.1
A2	47.5	2.3	0.74	0.28	<0.5	0.07
A3	52	1.9	0.66	0.29	<0.5	0.04
A4	54.9	2	0.78	0.27	<0.5	0.04
A5	54.2	2.1	0.71	0.35	<0.5	0.08
A6	0.76	2.4	0.76	0.36	<0.5	0.07
A7	53.6	2.1	0.67	0.4	<0.5	0.05

Source: AAQ Monitoring Results, March 2016 to May 2016

* Mineralogical composition of free Silica in PM₁₀ has been analyzed once in a season for each monitoring location.

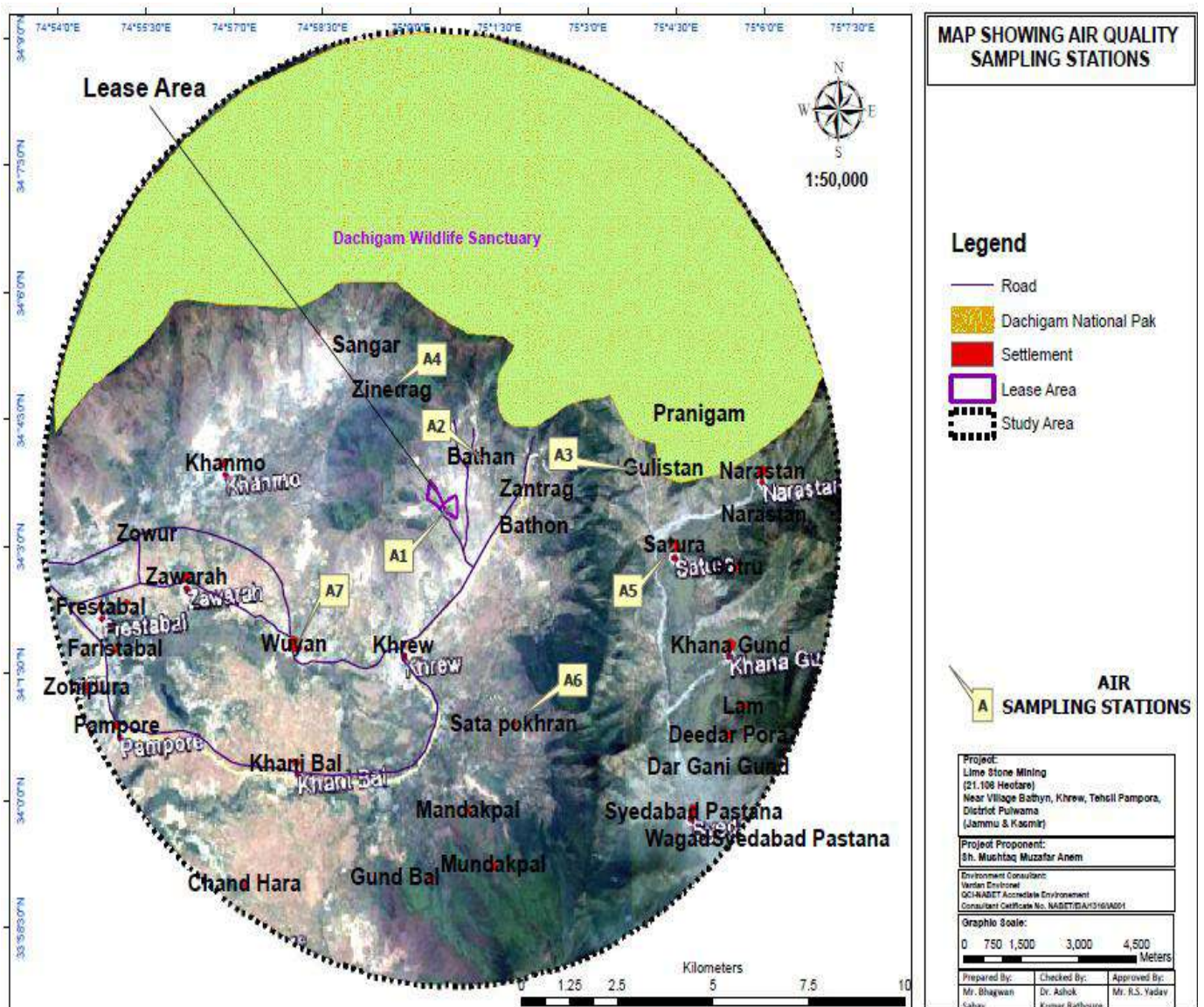


Figure 3.4: Key plan of Air Monitoring Stations



3.4.3 Results

The minimum and maximum concentrations of PM₁₀ for all the 7 AAQM stations were found to be **45.2 µg/m³** and **76.3 µg/m³** respectively and the minimum and maximum concentrations of PM_{2.5} for all the 7 AAQM stations were found to be **23.6 µg/m³** and **56.3 µg/m³** respectively. The range of Free Silica in PM₁₀ was found to be **2.0% to 2.7%**. Ambient Air Quality Monitoring reveals that the minimum and maximum concentrations of SO₂ were found to be **6.00 µg/m³** and **10.6 µg/m³** respectively. The prescribed CPCB limit of 80 µg/m³ for residential and rural areas has never surpassed at any station. The minimum and maximum concentrations of NO₂ were found to be **13.1 µg/m³** and **29.00 µg/m³** respectively. Lab Reports for Air Quality Monitoring and CPCB standard is attached as **Annexure VI**. The standards of Ambient Air Quality in India are available online at <http://cpcb.nic.in/National Ambient Air Quality Standards.php>.

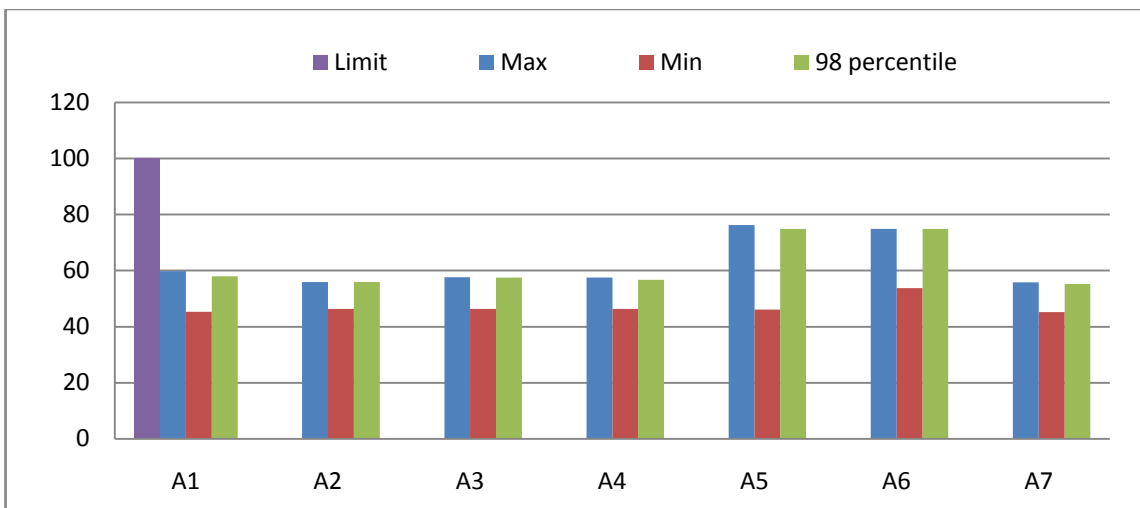


Figure 3.5: PM₁₀ Concentration in µg/m³

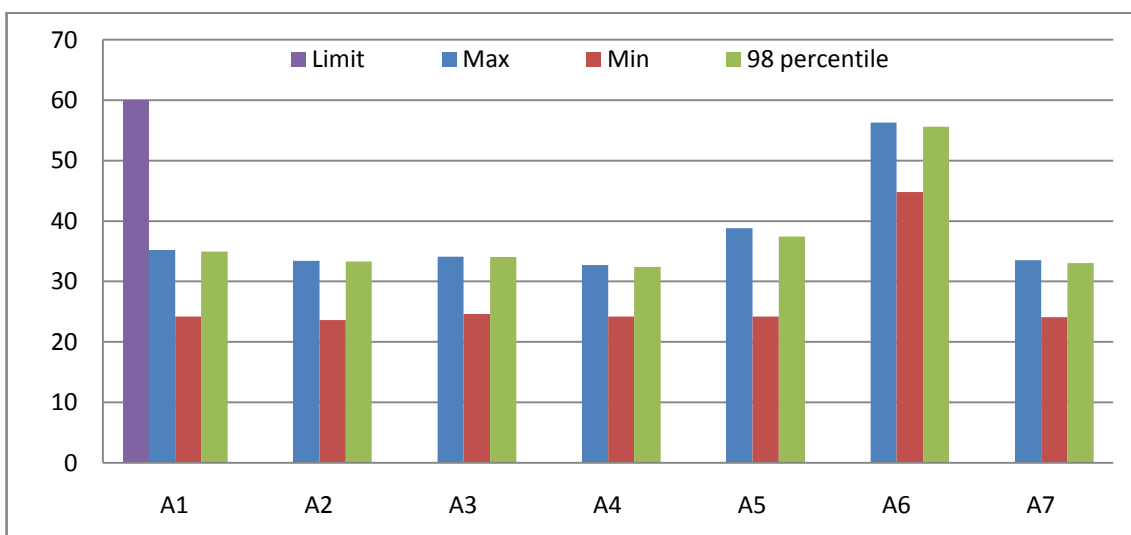


Figure 3.6: PM_{2.5} Concentration in µg/m³

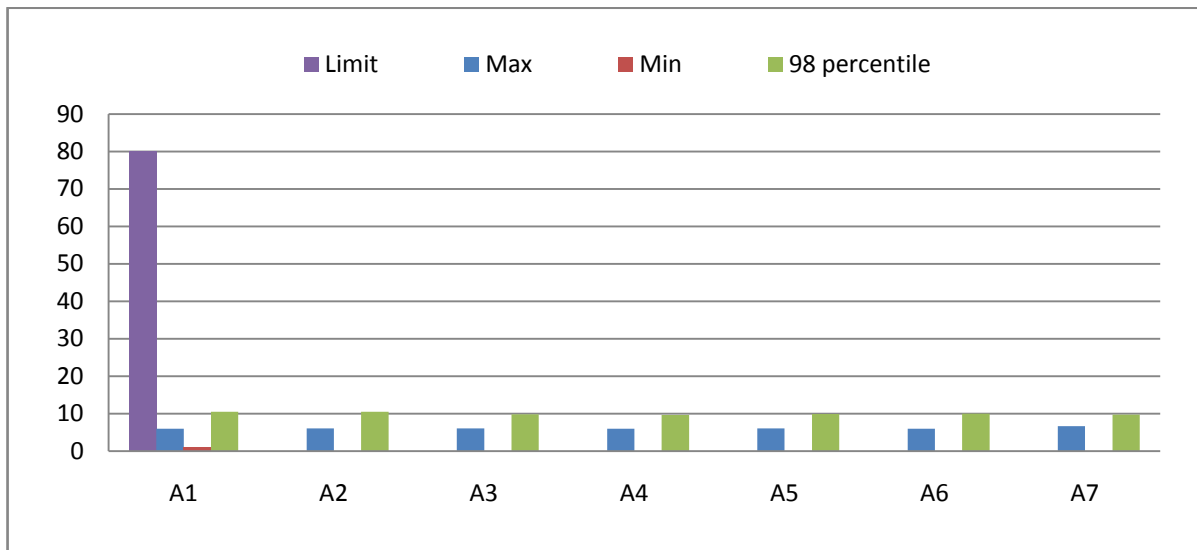


Figure 3.7: SO₂ Concentration in µg/m³

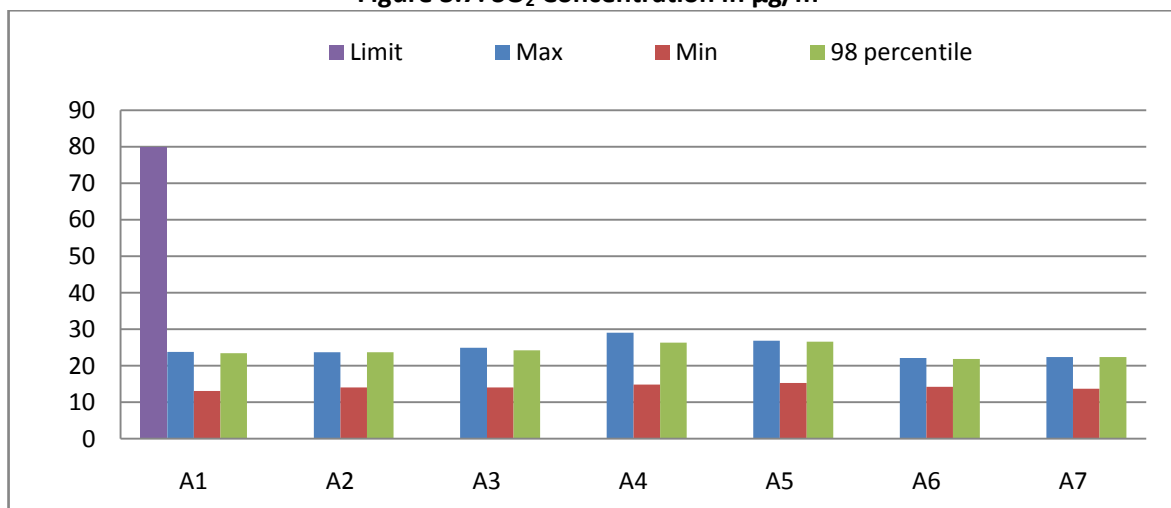


Figure 3.8: NO₂ Concentration in µg/m³

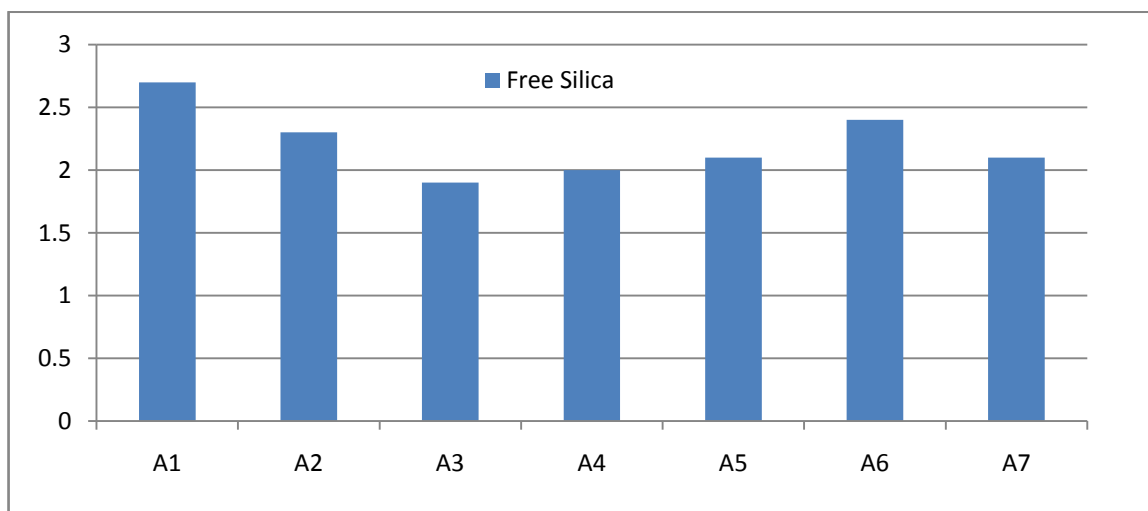


Figure 3.9: Range of Free Silica in PM₁₀

3.5 WATER ENVIRONMENT

3.5.1 Methodology Adopted for Selection of Sampling Station

The sampling was done both for surface water and underground water. The samples were taken from the identified monitoring locations within the 10 Km radius of the study area. Total of **9** samples were taken (**7** for ground water and **2** for surface water). The water quality sampling locations are described in **Table 3.9 (a) and 3.9(b)** and shown in **Figure 3.10**.

Table 3.9 (a): Ground Water Sampling Stations

Station	Sampling Location	Coordinates		Aerial Distance (Km) and Direction From Mine Site
		Latitude	Longitude	
GW1	Near Project Site	34°3'21.821"N	75°0'37.957"E	Mine Site
GW2	Near Village Bathan	34°3'58.56"N	75°1'10.204"E	1 Km, N
GW3	Near Villag-Pranigam	75°4'4.542"E	75°4'4.542"E	5.1Km, nE
GW4	Near Village-Zinetrag	34°4'46.086"N	74°59'40.977"E	2.8 Km, NW
GW5	Near Village-Satura	34°2'57.272"N	75°4'27.104"E	5.7 Km, NE
GW6	Near Village-SataPokhran	34°0'48.896"N	75°1'45.649"E	5 Km, SE
GW7	Near Village-Wuyan	34°1'46.708"N	74°57'58.798"E	5 Km, SW

Source: SOI Toposheet and Field Visit

Table 3.9(b): Surface Water Sampling Stations

Station	Sampling Location	Coordinates		Aerial Distance (Km) and Direction from Mine Site	Criteria
		Latitude	Longitude		
SW1	Canal near Village-Bhud Kalan	34°1'4.796"N	74°56'1.219"E	8 Km, SW	Canal
SW2	Canal near Village- Tapu Majra	34°1'5.941"N	74°55'59.383"E	9 Km, SW	Canal



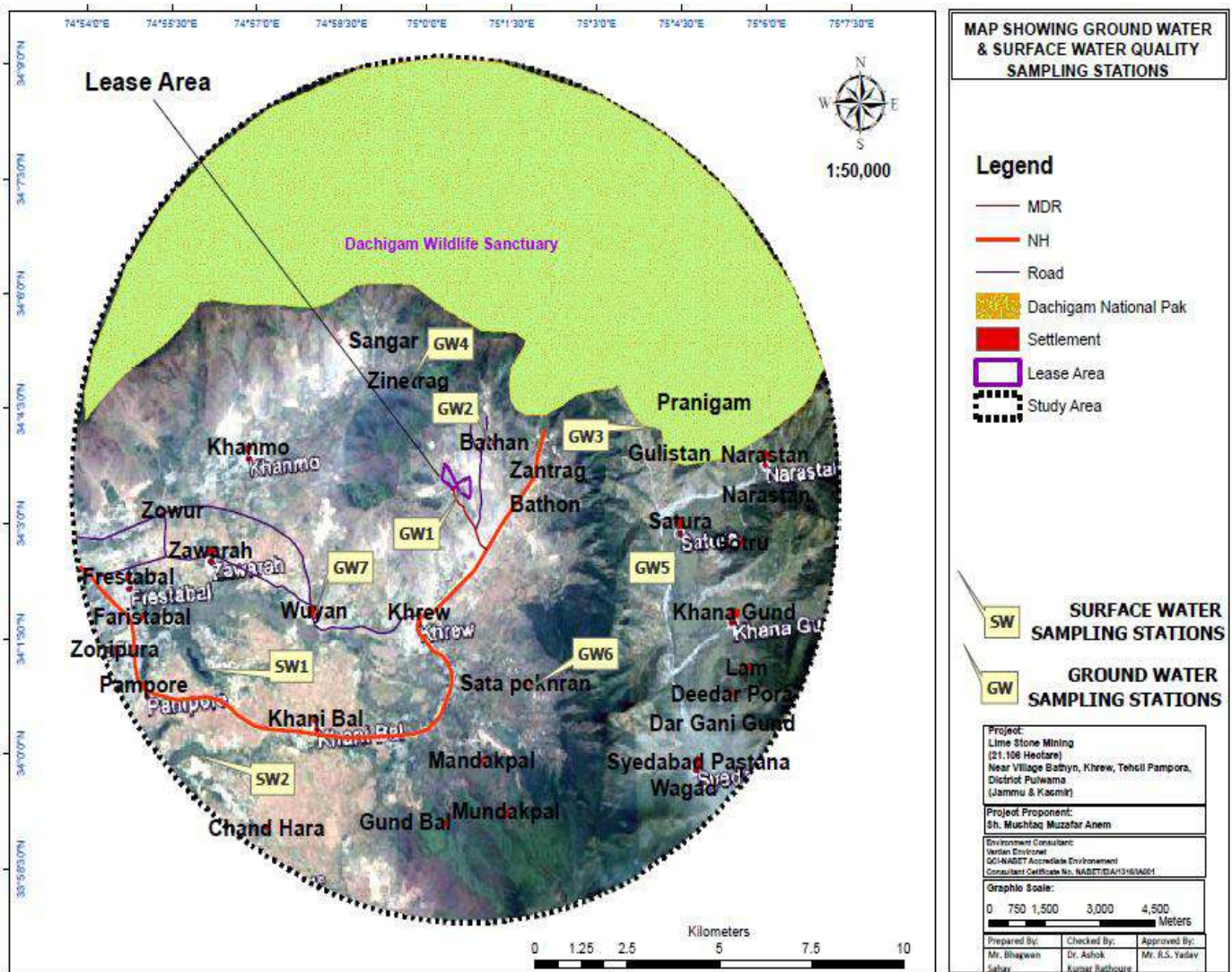


Figure 3.10: Key Plan of Water Sampling Stations

Table 3.10: Physico-chemical and microbiological Analysis of Ground Water

S. No.	Parameter	GW1	GW2	GW3	GW4	GW5	GW6	GW7
Physical Parameter								
1.	pH (at 25 °C)	7.58	7.67	7.48	7.16	7.40	7.79	7.52
2.	Colour (Hazen Unit)	<5	<5	<5	<5	<5	<5	<5
3.	Turbidity (NTU)	<1	<1	<1	<1	<1	<1	<1
4.	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5.	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
Chemical Parameter								
6.	Total Hardness as CaCO ₃ (mg/L)	108.54	126.53	148.67	101.54	120.58	128.54	168.16
7.	Calcium as Ca (mg/L)	28.35	34.81	32.14	33.38	39.49	41.47	36.25
8.	Alkalinity as CaCO ₃ (mg/L)	126.00	115.19	136.53	86.37	105.64	131.00	99.86
9.	Chloride as Cl (mg/L)	48.70	37.56	48.69	40.44	45.62	38.92	41.23
10.	Cyanide as CN (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
11.	Magnesium as Mg (mg/L)	9.19	9.64	16.64	4.44	5.36	6.09	18.88
12.	Total Dissolved Solids (mg/L)	220.00	199.00	260.00	207.00	380.00	310.00	410.00
13.	Sulphate as SO ₄ (mg/L)	8.26	7.59	18.10	9.54	12.27	11.45	9.53
14.	Fluoride as F (mg/L)	0.29	0.27	0.21	0.23	0.30	0.32	0.27
15.	Nitrate as NO ₃ (mg/L)	4.54	4.16	12.50	3.12	6.68	4.57	5.92
16.	Iron as Fe (mg/L)	0.18	0.16	0.68	0.18	0.21	0.22	0.20
17.	Aluminium as Al (mg/L)	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
18.	Boron (mg/L)	0.26	0.32	0.43	0.36	0.42	0.30	0.39
19.	Chromium as Cr (mg/L)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
20.	Conductivity (mS/cm)	0.404	0.335	0.440	0.348	0.640	0.530	0.680
21.	Phenolic Compounds (mg/L)	< 0.001	< 0.001	< 0.001	<0.001	<0.001	<0.001	<0.001
22.	Mineral Oil (mg/L)	< 0.01	< 0.01	< 0.01	<0.01	<0.01	<0.01	<0.01
23.	Anionic Detergents as MBA (mg/L)	<0.02	< 0.02	< 0.02	<0.02	<0.02	<0.02	<0.02
24.	Zinc as Zn (mg/L)	0.50	0.58	0.68	0.75	0.26	<0.02	0.23
25.	Copper as Cu (mg/L)	0.28	0.18	0.28	0.20	0.14	<0.02	0.08
26.	Manganese as Mn (mg/L)	< 0.10	< 0.10	< 0.10	<0.10	<0.10	<0.10	<0.10
27.	Cadmium as Cd (mg/L)	< 0.001	< 0.001	< 0.001	<0.001	<0.001	<0.001	<0.001
28.	Lead as Pb (mg/L)	< 0.01	< 0.01	< 0.01	<0.001	<0.001	<0.001	<0.001

29.	Selenium as Se (mg/L)	< 0.01	< 0.01	< 0.01	<0.01	<0.01	<0.01	<0.01
30.	Arsenic as As (mg/L)	< 0.01	< 0.01	< 0.01	<0.01	<0.01	<0.01	<0.01
31.	Mercury as Hg (mg/L)	<0.001	< 0.001	<0.001	<0.001	<0.001	<0.001	<0.001
32.	Total Coliform (MPN/100 mL)	<2/100ml	<2/100ml	<2/100ml	<2/100ml	<2/100ml	<2/100ml	<2/100ml
Microbiological Parameter								
33.	<i>E. coli</i> (CFU/100mL)	Absent	Absent	Absent	Absent	Absent	Absent	Absent

Note: There are more than 60 parameters as per IS 10500:2012, here 33 parameter has been analyzed as per discussed by team. IS 10500:2012

Table 3.11: Physico-chemical Analysis of Surface Water

S. No.	Parameter	SW1	SW2
Physical Parameter			
1.	pH (at 25 °C)	7.98	7.63
2.	Colour (Hazen)	<5	<5
3.	Turbidity (NTU)	<1	<1
4.	Odour	Agreeable	Agreeable
5.	Total Hardness as CaCO ₃ (mg/L)	116.08	96.57
Chemical Parameter			
6.	Calcium as Ca (mg/L)	39.50	35.39
7.	Alkalinity as CaCO ₃ (mg/L)	109.63	89.27
8.	Chloride as Cl (mg/L)	25.21	20.64
9.	Residual free Chlorine (mg/L)	<0.20	<0.20
10.	Cyanide as CN (mg/L)	<0.02	<0.02
11.	Magnesium as Mg (mg/L)	4.26	2.01
12.	Total Dissolved Solids (mg/L)	270.00	266.00
13.	Total Suspended Solids (mg/L)	15.00	13.00
14.	Dissolved Oxygen (mg/L)	7.1	7.3
15.	Sulphate as SO ₄ (mg/L)	11.22	10.39
16.	Fluoride as F (mg/L)	0.19	0.17
17.	BOD (3 Days at 27 °C) (mg/L)	5.00	<5.0
18.	COD (mg/L)	8.50	8.90
19.	Conductivity (mS/cm)	0.452	0.441
20.	Nitrate as NO ₃ (mg/L)	3.93	3.26
21.	Iron as Fe (mg/L)	0.13	0.11
22.	Aluminium as Al (mg/L)	<0.03	<0.03
23.	Boron (mg/L)	0.23	0.20
24.	Hexa Chromium as Cr ⁺⁶ (mg/L)	<0.01	<0.01
25.	Phenolic Compounds (mg/L)	<0.001	<0.001
26.	Mineral Oil (mg/L)	<0.01	<0.01
27.	Anionic Detergents as MBAS (mg/L)	<0.02	<0.02
28.	Zinc as Zn (mg/L)	0.25	0.21
29.	Copper as Cu (mg/L)	0.05	0.04

30.	Manganese as Mn (mg/L)	<0.10	<0.10
31.	Cadmium as Cd (mg/L)	< 0.001	< 0.001

3.5.2 INTERPRETATION

Analysis results of ground water reveal the following;

- **pH** varies from to **7.16 to 7.79.**
- **EC** varies from **0.335 to 0.680 mS/cm**
- **Total Hardness** varies from **101.54 to 168.16 mg/L.**
- **Total Dissolved Solids** varies from **199.00 to 410.00 mg/L.**
- **Fluoride** varies from **0.21 to 0.32 mg/L**
- **Chloride** varies from **37.56 to 48.70 mg/L**

Analysis results of surface water reveal the following;

- **pH** varies from to **7.63 to 7.98.**
- **EC** varies from **0.441 to 0.452 mS /cm**
- **Total Hardness** varies from **116.08 to 196.00 mg/L.**
- **Total Dissolved Solids** varies from **266.00 to 270.00 mg/L.**
- **Fluoride** varies from **0.17 to 0.19 mg/L**
- **Chloride** varies from **20.64 to 25.21 mg/L**
- **DO** varies from **7.1 to 7.3 mg/L**
- **BOD** varies from **<5.0 to 5.0 mg/L**
- **COD** varies from **8.50 to 8.90 mg/L)**

A review of the above chemical analysis reveals that there is some variation in chemical composition of water tapped from different sources but the ground water from all sources remains suitable for drinking purposes as all the constituents are within the limits prescribed for drinking water standards promulgated by Indian Standards (IS: 10500). Fluoride concentration in all the samples ranged from **0.17 to 0.19 mg/L** in surface water and **0.21 to 0.32 mg/L** in ground water in the study area of the mine site. Chloride is important in detecting the contamination of ground water. Its concentration increase rates of corrosion of metals in the distribution system. The permissible limit of chloride in drinking water is 250 ppm. The chloride concentration in water samples from all the locations ranged from **20.64 to 25.21mg/L** in surface water and **37.56 to 48.70** in ground water. Specific conductivity is a measure of total dissolved solids present in water and it ranges from **266.00 to 270.00 mg/L** in surface water **199.00 to 410.00 mg/L** in ground water. Lab Reports for water Quality Monitoring is attached as **Annexure VII**. Water Quality data and CPCB standard for water quality parameters and Indian standard Drinking water Specification, IS 10500:2012 for water quality is available online at <http://cgwb.gov.in/Documents/WQ-standards.pdf>.

3.6 SOIL ENVIRONMENT

3.6.1 Soil Profile of District Yamuna Nagar

The soil is generally alluvial in nature which prone to water logging. Also nature of recently alluvial calcareous has been observed.

3.6.2 Soil Quality and Characteristics

Assessment of soil quality is an important aspect with reference to tree plantations, percolation of water, ground water impact etc. The information on soils has been collected from various secondary sources and also through primary soil sampling analysis of which is described in this section.

3.6.3 Methodology adopted for Selection of Sampling Station

Random soil samples were collected up to depth of 15 cm and homogenized samples were then sent to the laboratory for analysis. The physical and chemical characteristics of the soil of the study area have been assessed by analyzing various parameters as per the methods described in "Soil Chemical Analysis" (Jackson, 1967). The soil quality of the study area has been assessed by collecting samples from **4** different locations. Details of soil sampling locations are presented in **Table 3.12** and shown in **Figure 3.11**.



Table 3.12: Soil Monitoring Station Details

Stations	Sampling Location	Coordinates		Aerial Distance(KM) And Direction From Mine Site	Criteria
		Latitude	Longitude		
S1	Mine Site	34°3'21.821"N	75°0'37.957"E	Mine site	Non Agricultural soil
S2	Near Village Zinetrag	34°4'46.086"N	74°59'40.977"E	2.8 Km, NW	Agricultural soil
S3	Near Village-Pranigam	75°4'4.542"E	75°4'4.542"E	5.7 Km SW	Non Agricultural soil
S4	Near Village-Wuyan	34°1'46.708"N	74°57'58.798"E	5 Km, SW	Agricultural soil

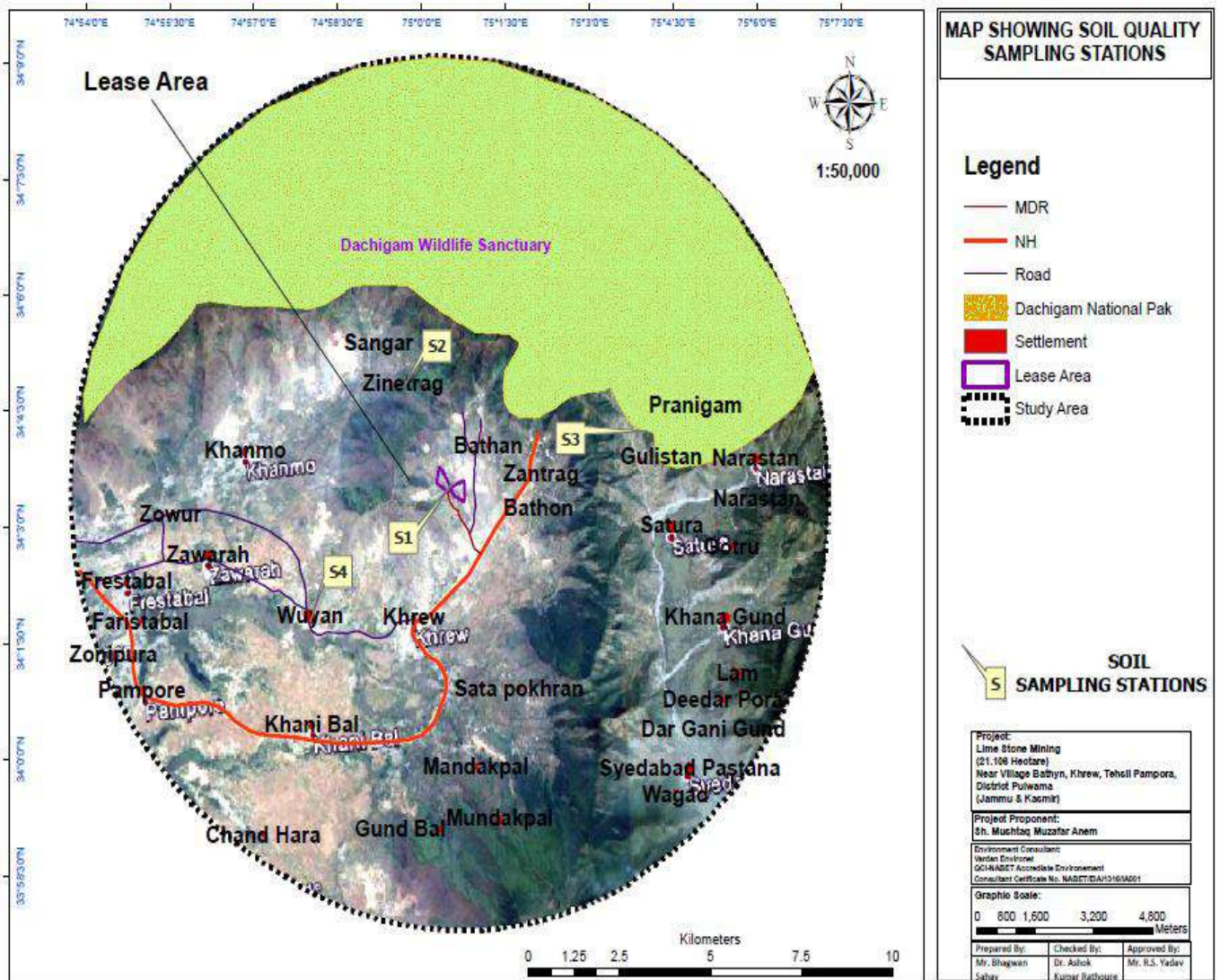


Figure 3.11: Key Plan of Soil Sampling Stations

Table 3.13: Physico-chemical Analysis of Soil

S. No.	Parameter	Units	S1	S2	S3	S4
1.	pH (at 25 °C)	--	7.64	6.63	7.66	6.99
2.	Conductivity	mS/cm	0.390	0.320	0.239	0.40
3.	Soil Texture	--	Silty Loam	Silty Loam	Sandy	Silty Loam
4.	Color	--	Yellowish Brown	Yellowish Brown	Brownish White	Yellowish Brown
5.	Water holding capacity	%	24.19	28.4	22.85	27.9
6.	Bulk density	gm/cc	1.10	1.30	1.33	1.10
7.	Chloride as Cl	mg/100gm	12.67	28.04	20.64	36.10
8.	Calcium as Ca	mg/100gm	24.32	12.90	30.50	12.08
9.	Sodium as Na	mg/100gm	28.10	9.80	22.15	20.62
10.	Potassium as K	kg/hect.	85.00	90.00	76.80	78.17
11.	Organic Matter	%	0.72	0.72	0.29	0.39
12.	Magnesium as Mg	mg/100gm	1.94	7.02	15.14	5.41
13.	Available Nitrogen as N	kg./hect.	198.00	260.10	181.10	238.10
14.	Available Phosphorus	kg./hect.	34.10	58.13	28.58	47.06
15.	Zinc as Zn	mg/100gm	5.15	3.05	3.86	5.43
16.	Manganese as Mn	mg/100gm	1.00	0.75	1.02	1.11
17.	Chromium as Cr	mg/100gm	0.42	0.42	1.10	0.53
18.	Lead as Pb	mg/100gm	0.26	0.10	0.38	0.20
19.	Cadmium as Cd	mg/100gm	0.70	0.39	1.05	0.41
20.	Copper as Cu	mg/100gm	2.98	1.19	2.90	2.22

3.6.4 Interpretation

The analysis results show that soil is basic in nature as pH value ranges from **6.63 to 7.66** with organic matter **0.29% to 0.72%**. The concentration of Nitrogen- **181 kg/ha to 260.10 kg/ha**, Phosphorus- **28.58 kg/ha to 58.13 kg/ha** and Potassium- **76.80kg/ha to 90.00 kg/ha** has been found to be in good amount in the soil samples. Soil texture is Silty Loam to Sandy. Soil Quality data and standard soil quality standards are enclosed as **Annexure VIII**.

3.7 NOISE ENVIRONMENT

Noise in general is sound, which is composed of many frequency components of various loudness distributed over the audible frequency range. Various noise scales have been introduced to describe, in a single number, the response of an average human being to a complex sound made up various frequencies at different loudness levels. The most common and heavily favored of those scales is the A weighted decibel (dBA). This is more suitable for audible range of 20 to 20,000 Hertz. The scale has been designed to weigh various components of noise according to the response of a human ear. The main objective of the noise level monitoring is to assess the background noise levels in different zones viz., industrial, commercial, residential and silence zones within the study area. Noise levels were measured in residential areas, bus stands and other settlements located within 10 Km radius around the site.

3.7.1 Noise Analysis within the Study Area

The noise analysis within the study area was recorded using 4012 Maxtech sound level meter. The instrument was calibrated with a Standard Acoustic calibrator before using in the field. The measurements were carried out continuously for the 24-hour period to obtain hourly equivalent sound pressure level, 1 hour Leq. From these values, day and night time as well as 24-hour Leq values were also calculated. The Leq value is the equivalent continuous sound level, which is equivalent to the same sound energy as the fluctuating sound measured in the same period.



3.7.2 Methodology adopted for Selection of Sampling Station

Noise levels are more annoying in the night time particularly in the residential areas. The environmental impact of noise can have several effects varying from annoyance to hearing loss depending on loudness of noise levels. The monitoring for noise levels were done in 4 locations keeping considering the population and traffic of the area. The locations are depicted in **Table 3.14** and **Figure 3.12** and levels recorded stated in **Table 3.15**.

Table 3.14: Noise Monitoring Sampling Stations

Station	Sampling Locations	Coordinates		Aerial Distance (Km) and Direction from Mine Site
		Latitude	Longitude	
N1	Mine Site	34°3'21.821"N	75°0'37.957"E	Mine Site
N2	Near Village-Zantrag	34°3'38.772"N	75°1'54.681"E	2 Km, NE
N3	Near Village-Pampore	34°0'49.641"N	34°0'49.641"N	9.3 Km, SW
N4	Near Village-Khani Bal	34°0'15.565"N	74°58'44.045"E	6.4 Km, S

Table 3.15: Noise Levels in Study Area

Location Code	Avg. Day Time Noise Level Leq. dB (A)	Avg. Night Time Noise Level Leq. dB (A)
	Day Time(6:00 a.m. to 10:00 p.m.)	Night Time (10:01 p.m. to 5:59 a.m.)
N1	53.50	40.50
N2	50.47	41.73
N3	53.00	41.83
N4	53.00	42.10

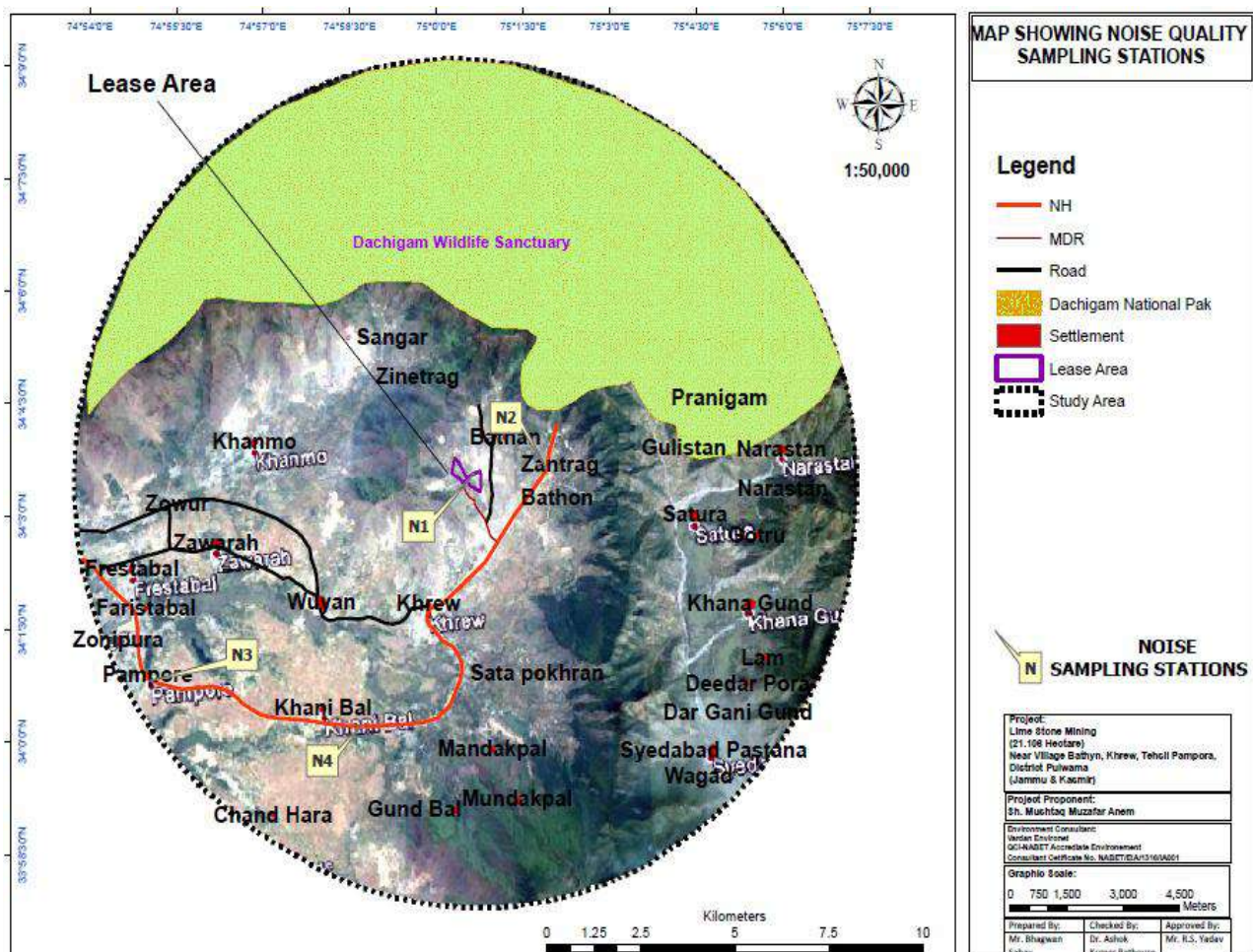


Figure 3.12: Key plan of Noise Monitoring Station

3.7.3 Interpretation of Noise Monitoring

Ambient noise levels were measured at 4 locations around the proposed project site. Minimum and maximum noise levels recorded during the Night time were from **40.50 L_{eq} dB** and **42.10 L_{eq} dB** respectively and minimum and maximum level of noise during Day time were **50.47 L_{eq} dB** and **53.50 L_{eq} dB** respectively. Thus noise levels at all locations were observed to be within the prescribed limits. Noise Quality data and CPCB standard is attached as **Annexure IX** and Ambient Air Quality Standards in respect of Noise is available online at http://cpcb.nic.in/divisionsofheadoffice/pci2/noise_rules_2000.pdf.

From the above study and discussions it can be concluded that noise levels in the study area are well within the prescribed limits as prescribed by the CPCB and State Pollution Control Board.

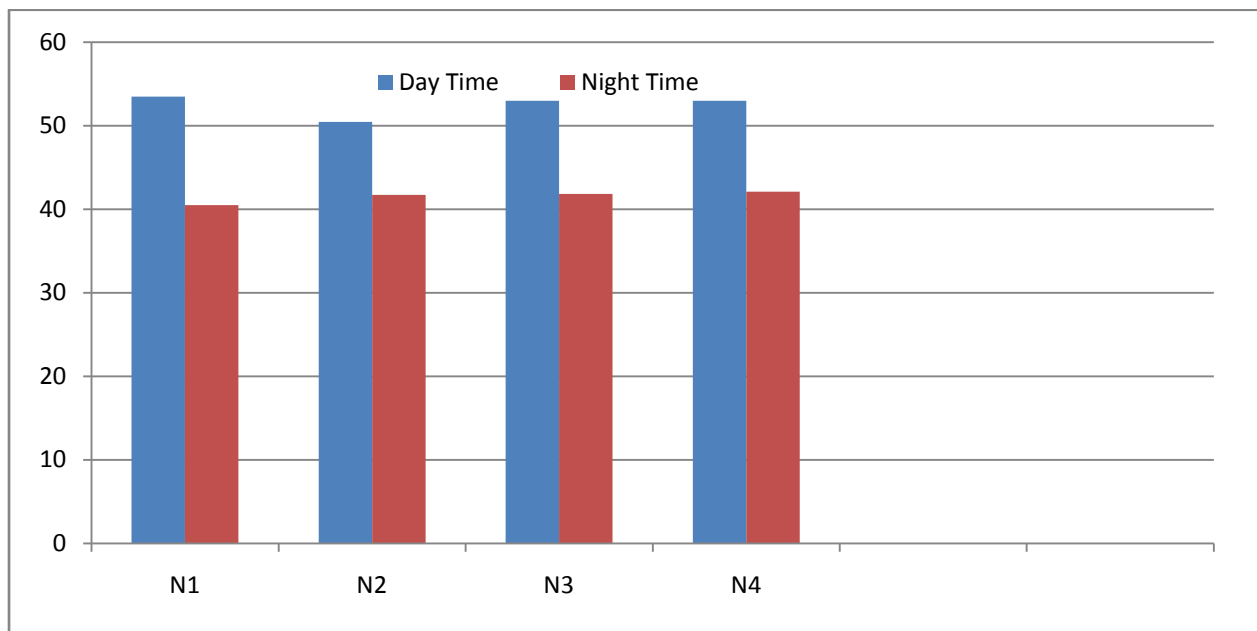


Figure 3.13: Noise Monitoring Result

3.8 TRAFFIC STUDY

The proposed Lime stone Mine is granted Got of J&K for captive use in cement Plant of M/s Dawar Cement Pvt. Ltd. The Cement Plant is situated nearby the mine site approximately at a distance of 500 m. the trucks carrying mineral from mine will lead to the cement plant and after unloading they will come back to the mine site for further transportation of the mineral. 6 Nos. of trucks will be deployed by the proponent for this purpose. Since, the additional load of mineral transportation will be b/w the mine site and cement plant it will not have any significant impact on the road transportation of the village or MDR or National Highway (NH-1A).

However, in order to calculate the traffic density on different Village roads, MDRs and NH/SH present in the study area traffic study was conducted. Traffic study measurements were performed at two locations of these highways is marked on the map in **Figure 3.14** and **Table 3.16**. The traffic study has been conducted on 7th, 8th, 9th, 10th March 2016. The detailed traffic study is enclosed as **Annexure-X** and data has been given in **Table 3.17**.

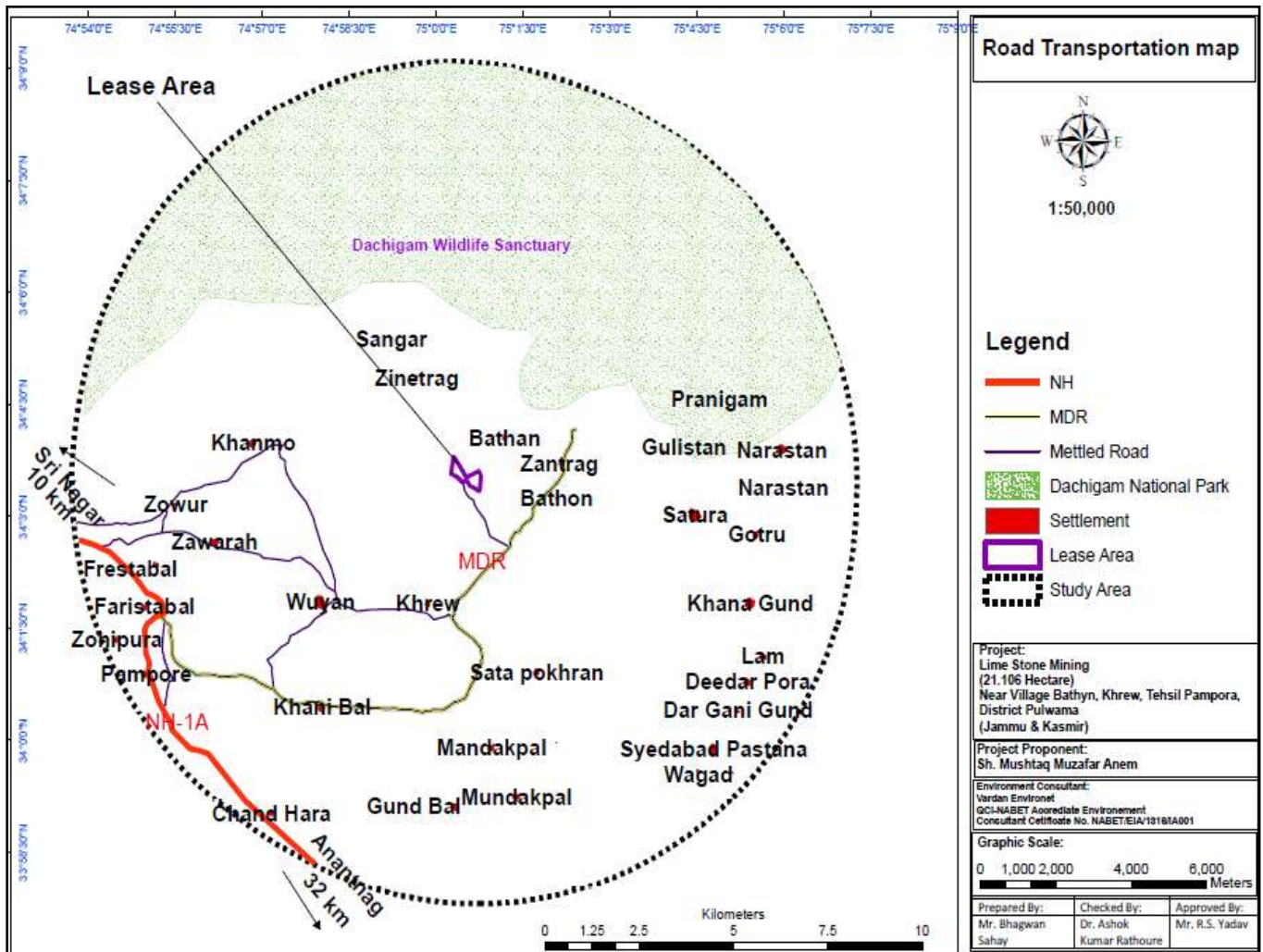


Figure 3.14: Showing the Typically Haul Road which is Connected to Highways

Table 3.16: Roads and Highways in the Study Area

Name of National/State Highway	Direction	
	Up	Down
NH-1A	Sri Nagar	Anantnag
MDR-1	Zantrag	NH1-A

Traffic data collected continuously for 24 hours by visual observation and counting of vehicles under three categories, viz. heavy motor vehicles, light motor vehicles and two/three wheelers. As traffic densities on the roads are high, two skilled persons were deployed simultaneously at each station during each shift- one person on each of the two directions for counting the traffic. At the end of each hour, fresh counting and recording was undertaken. Total numbers of vehicles per hour under the three categories were determined.

Table 3.17: No. of Vehicles per Day

S. No.	Vehicles Distribution	Number of Vehicles Distribution/Day		PCU	Total Number of Vehicle in PCU		Total Number of Vehicle (PCU)/Hour	
		NH-1A	MDR-1		NH-1A	MDR-1	NH-1A	MDR-1
1.	Cars	1503	55	1	1503	55	63	2.3
2.	Buses	678	3	3	2022	9	84	0.37
3.	Trucks	894	10	3	2682	30	112	1.2

4.	Two wheelers	810	17	0.5	405	8.5	17	0.35
5.	Three wheelers	598	00	0.75	448	00	19	00
Total		4483	85		7060	102.5	295	4.22

Table 3.18: Existing Traffic Scenario and LOS

Road	V (Volume in PCU/hr)	C (Capacity in PCU/hr)	Existing V/C Ratio	LOS
NH-1A	295	3000	0.09	A
MDR-1	4.22	900	0.004	A

Note: The existing level may be “Excellent” for NH-1A, and MDR-1.

V/C	LOS	Performance
0.001-0.200	A	Excellent
0.201-0.401	B	Very Good
0.401-0.601	C	Good/ Average/ Fair
0.601-0.801	D	Poor
0.801-1.000	E	Very Poor

During Mine Operation

Total Capacity of mine	: 53,055 TPA
No. of working days	: 300
Extraction and Transportation of mineral	: 176 MT/day
Working hours per day	: 8 hour
Truck Capacity	: 10 Tons
Frequency of trucks/tankers deployed/day (6 no. x 3 trips/day x 2 (up/down)	: 36
Frequency of trucks deployed/hr	: 5
Increase in PCU/hr	: 15

Since, mineral will be transported from mine to Cement Plant which is close to the mining site the increased PCU/Hr(15) will have no impact on the NH or MDR. However, once in a while if trucks will lead to NH via MDR for any other reason than mineral transportation it will have insignificant impact on current traffic scenario. Considering that if all trucks transporting mineral will lead to NH through MDR a calculation is made to analyze the probable impact and it was found that there is no change in a level of service due to increased vehicular movement. Table 3.19 shows increased traffic in case all vehicles will lead to NH through MDR.

Table 3.19: Traffic Scenario and LOS if mineral transported to NH through to MDR

Road	Increased PCU's- State/National Highway	V	C	Modified V/C Ratio	LOS
NH-1 A	15x 60%= 9	295+9 = 304	3000	0.10	A
MDR-1	15 x 40%= 6	4.22+6 = 10.2	900	0.011	A

3.8.1 Conclusion

It is estimated that there is no impact on NH or MDR because of this mining activity. Only 6 dumpers/day [6 no. x 3 trips/day x 2 (up/down) = 36] will be required for transport of mineral from mine to the Cement Plant. The LOS value from the proposed mining will be same as earlier values for NH-1A and MDR-1. So the additional load on the carrying capacity of the concern roads is not likely to have any significant adverse affect.



3.9 BASELINE STATUS FOR FLORA AND FAUNA

The biodiversity we see today is the fruit of billions of years of evolution, shaped by natural processes. The vast array of interactions among the various components of biodiversity makes the planet habitable for all species, including humans. There is a growing recognition that, biological diversity is a global asset of tremendous value to present and future generations. At the same time, the threat to species and ecosystems has never been as great as it is today. Species extinction caused by human activities continues at an alarming rate. Protecting biodiversity is in our self-interest.

Survey Methodology

Detailed survey was conducted to evaluate floral and faunal composition of the study area. Primary data on floral and faunal composition was recorded during site visit and secondary data was collected from the Forest department and published relevant literature.

Field study period: The ecological survey has been conducted for one season. The details are given below:

Core zone: At the project site.

Buffer zone: Around the project site in 10 Km radius.

Inventory of flora and fauna has been prepared on the basis of collected data. The mode of data and parameters considered during field investigations is given below:

The primary objective of survey was to describe the floral and faunal communities within the study area. The sampling plots for floral inventory were selected randomly in the suitable habitats (Anderson, 1867; Jain and Rao, 1983). The methodology adopted for faunal survey involve random survey, opportunistic observations, diurnal bird observation, active search for reptiles, faunal habitat assessment, active search for scats and foot prints, animal call, and review of previous studies. The aim was to set baselines in order to monitor and identify trends after the commissioning of the mining activity. Emphasis has been placed on presence of endemic species, threatened species if any present in the study area.

Table 3.20: Mode of data collection and parameters considered during the Biological survey

Aspect	Data	Mode Of Data Collection	Parameters Monitored
Terrestrial Ecology	Primary data collection	By field survey	Floral and Faunal diversity
	Secondary data collection	From authentic sources like Forests/Wild Life department of Jammu and Kashmir, available published literatures like Biodiversity and Environment Management and available publishes papers of scholars.	Floral and Fauna diversity and study of vegetation, forest type, importance etc.

Floral diversity of the study area

The climatic, edaphic and biotic variations with their complex interrelationship and composition of species, which are adapted to these variations, have resulted in different vegetation cover, characteristic of each region (Ohasi, 1975). The tree species, herbs, shrubs, climbers and major crops, were documented during this base line study.

Trees: The dominant trees in the study area are following:-

Table 3.21 : Trees in the study area

S.No.	Tree Species	Family	Common Name	Status
1.	<i>Abies pindrow Royle.</i>	Pinaceae	Silver fir, Budul, Taleesha	Common
2.	<i>Acer caesium</i>	Aceraceae	Chaind, Tilpattar	Common
3.	<i>Betula utilis D.Don.</i>	Betulaceae	Burja, Bhojpatra	Common



4.	<i>Celtis australis</i> Linn.	Ulmaceae	Kharak brimij	Common
5.	<i>Crataegus songaric</i> G.Koch.	Rosaceae	Ringkul, Shonth	Common
6.	<i>Euonymus hamiltonian</i> Wallich.	Celastraceae	Sheelkul, Chhalchhattar	Uncommon
7.	<i>Euonymus fimbriatus</i> Wall. roxb	Celastraceae	Tran, Lichhoi	Uncommon
8.	<i>Fraxinus hookeri</i> Wenzig	Oleaceae	Sinnu, Soom, Hoom	Threatened
9.	<i>Juglans regia</i> Linn.	Juglandaceae	Walnut, dun, khod, Achho	Common
10.	<i>Morus alba</i>	Moraceae	Tut	Common
11.	<i>Morus indica</i>	Moraceae	Tut	Common
12.	<i>Morus nigra</i>	Moraceae	Tut	Common
13.	<i>Parrotiopsis jacquimontiana</i> (Decne) Rehder.	Hamamelidaceae	Hatab, Pasaid	Common
14.	<i>Pinus excelsa</i>	Pinaceae		Common
15.	<i>Platanus orientalis</i> L.	Plantanaceae	Booin, Chinaar, Chanaar	Common
16.	<i>Populus caspica</i> Bornm.	Salicaceae	Frass, Safeda	Common
17.	<i>Prunus cerasifera</i>	Rosaceae	Chaier	Common
18.	<i>Prunus cornuta</i> (Wall ex. Royle) steudel	Rosaceae	Bharath	Common
19.	<i>Pyrus malus</i>	Rosaceae		
20.	<i>Quercus robur</i> L.	Fagaceae	Oak, Vilaiti, Banj	Common
21.	<i>Rubinia pseudoacacia</i>	Papilionaceae		Common
22.	<i>Salix alba</i> Linn.	Salicaceae	Bot vir, white willow	Common
23.	<i>Salix babylonica</i>	Salicaceae	Majnoo kashirveer	Common
24.	<i>Salix wallichiana</i>	Salicaceae	Girveer, Geur, Bhanshri	Common
25.	<i>Taxus wallichiana</i>	Taxaceae	Postul	Threatened
26.	<i>Ulmus lavigata</i>	Ulmaceae		Common
27.	<i>Ulmus wallichiana planchon.</i>	Ulmaceae	Marnu brin, Braari, Brade	Common
28.	<i>Ziziphus mauritonia</i> Lamk.	Rhamnaceae	Ber, Badra	Common

Source: Management Plan of Dachigam National Park 2011-2016.

Shrubs: Total 15 shrub species belong to 7 families are enumerated from the study area. The shrubs observed in the study area are given in the table 4.21.

Table 3.22: Shrubs in the study area

S. No.	Shrub	Family	Local name	Status
1.	<i>Berberis huegeliana</i> Schaeider	Berberidaceae	Sumbal, Daruharidra	Rare
2.	<i>Indigofera hebeptala</i> Benth.ex.Baker.	Fabaceae	Krass, Sakena	Scarcely distributed
3.	<i>Indigofer haterantha wallich</i> ex. Brandis	Fabaceae	Krass, kainthi	Common
4.	<i>Rosa webiana</i> Wallich ex. Royle.	Rosaceae	Arwal, Jungli gulaab	Common
5.	<i>Rosa antennifer</i>	Rosaceae	Jhaanshi, chhanchh	Common
6.	<i>Rubus pungens</i> Comb.	Rosaceae	Chhansh, Jhaansh	Common

7.	<i>Rubus ulmifolius</i> Schott	Rosaceae	Jhaanshi, Chhansh	Common
8.	<i>Sorbaria tomentosa</i> (lindley) Rehder	Rosaceae	Karukni, Kidsungal	Common
9.	<i>Spiraea canescens</i> D.Don	Rosaceae	Dhakk, Takky	Common
10.	<i>Hydrangea</i> <i>macrophylla</i> L.	Hydrangea	Himgainda	Abundant
11.	<i>Chaerophyllum</i> <i>acuminatum</i> Lindley	Apiaceae	Chikmi, Neochha	Common
12.	<i>Viburnum</i> <i>cotinifolium</i> D.Don	Caprifoliaceae	Kumansh, Bhutnoi	Abundant
13.	<i>Lonicera</i> <i>quinquelocularis</i> Hardw.	Caprifoliaceae	Bakkadu, Paakhar	Common
14.	<i>Gaultheria</i> <i>trichophylla</i> Royle.	Ericaceae	Gandhpuri booti, Gandhpura	Abundant
15.	<i>Rhododendron</i> <i>anthopogon</i> D.Don.	Ericaceae	Nchhni, Inga	Common

Source: Management Plan of Dachigam National Park 2011-2016.

Table: 3.23 List of Herbs species in the study area

S No.	Herbs	Family	Local name	Status
1.	<i>Anemone obtusiloba</i>	Ranunculaceae	Rattan jot	Uncommon
2.	<i>Aquilegia pubiflora wallich</i> <i>ex royle</i>	Ranunculaceae	Sita di panni	Uncommon
3.	<i>Aquilegia fragrance. Benth</i>	Ranunculaceae	Maime hait, kalumb	Common
4.	<i>Clath alba</i> Camb.	Ranunculaceae	Tahool , Ashpmaar	Common
5.	<i>Clematis connata</i> DC	Ranunculaceae	Hathkad bel, Dhanvati	Common
6.	<i>Clematis montana</i>	Ranunculaceae	Dashraanth , Dudh chivara	Common
7.	<i>Delphinium denudatum</i> <i>wallich ex hook.f. &Thomas</i>	Ranunculaceae	Nirbis , Nirvisha	Common
8.	<i>Delphinium roylei munz</i>	Ranunculaceae	Nirbis ,Nirvisha	Common
9.	<i>Thalictrum minus</i> L	Ranunculaceae	Peeli bani, Haichinsah	Common
10.	<i>Thalictrum pedunculatum</i> Edgew.	Ranunculaceae	Mamira ,Pinjaari	Uncommon
11.	<i>Viola sylvatica</i>	Violaceae	Nunposh	Common
12.	<i>Arenaria serpyllifolia</i> Linn.	Cryophyllaceae	Letarluni	Uncommon
13.	<i>Lychnis cornaria (L.)Desr.</i>	Cryophyllaceae	Laltraukal, Angaarda	Threatened
14.	<i>Hypericum perforatum</i> L.	Hypericaceae	Basantadu, Basanti	Common
15.	<i>Tribulus terresteris</i> L.	Zygophyllaceae	Bhakhada, Tirkundi	Common
16.	<i>Impatiens bicolor</i> Royle.	Balsaminaceae	Trul, Hajlu,	Common
17.	<i>Lathyrus emodi</i> (Wall.ex.Fritsch)Ali	Fabaceae	Khukni, Triputa	Abundant
18.	<i>Lathyrus pratensis</i> Linn.	Fabaceae	Khukni	Common
19.	<i>Lotus corniculatus</i>	Fabaceae		Common
20.	<i>Genum elatum</i> Wallich.	Rosaceae	Gogji mool, Bhadrasaak	Common

21.	<i>Potentilla atrosanguina</i> Lodd.	Rosaceae	Bajardantu, Rolu	Threatened
22.	<i>Astilbe rivularis</i> Buch.Ham.Ex.D.Don.	Saxifragaceae	Pothi	Common
23.	<i>Sexifraga Sibirica</i>	Saxifragaceae		Common
24.	<i>Sedum adenotrichum</i> Wall.Ex.Edgew.	Crassulaceae	Dazanposh	Abundant
25.	<i>Epilobium parviflorum</i> Schreb.	Onagraceae	Mellu, Loontar jadi	Common
26.	<i>Bupleurum swatianum</i> Nasir.	Apiaceae	Zardzaari, Shashparni	Common
27.	<i>Chaerophyllum acuminatum</i> Lindley.	Apiaceae	Chikmi, Neochha	Common
28.	<i>Chaerophyllum reflexum</i> Lindley.	Apiaceae	Jadgagari, Mukhach	Common
29.	<i>Ferula jaeschkeana</i> Vatke.	Apiaceae	Haput Kanphur, Hinga, Ghud-kaindal	Common
30.	<i>Heracleum lantum</i> Michx.	Apiaceae	Shuriyal, Phulao,	Common
31.	<i>Chaerophyllum villosum</i> Wall.ex.DC.	Apiaceae	Mukhach	Common
32.	<i>Pimpinella diversifolia</i> DC.	Apiaceae	Jehn,tirua	Common
33.	<i>Scandix pecten-veneris</i> L.	Apiaceae	Indusaag , Kachhidana	Common
34.	<i>Seseli libanotis</i> (L)W.Koch.	Apiaceae	Sappad gajari	Common
35.	<i>Vicatia coniifolia</i> DC.	Apiaceae	Shila dhaniya	Abundant
36.	<i>Asperrula oppositifolia</i> Regal.&Schmalth.	Rubiaceae	Machheet, Chhalmajeeth	Common
37.	<i>Gallium asperuloides</i> edgew	Rubiaceae	Machheetu	Common
38.	<i>Gallium vernum</i> Linn.	Rubiaceae	Peela machete	Common
39.	<i>Anaphalis</i> <i>margaritacea</i> (L)Benth.	Asteraceae	Bhojli,Kinja	Common
40.	<i>Anaphalis nepalensis</i> (Sprengel)Hand.	Asteraceae	Telgangi, Bhujli	Common
41.	<i>Artemisia dubia</i> Wallich ex.Besser	Asteraceae	Joon, krinidru	Common
42.	<i>Artemisia parviflora</i> Roxb.	Asteraceae	Joon, Tethwan	Common
43.	<i>Aster diplostephioids</i> C.B.Clark	Asteraceae	Tarakpushp, phullala	Abundant
44.	<i>Carpesium abrotanoides</i> Linn.	Asteraceae	Lihur	Common
45.	<i>Picris hieracioides</i> Linn.	Asteraceae	Trumbadu	Rare
46.	<i>Saussurea albescens</i> (DC)Sch.Bip.	Asteraceae	Baklol	Common
47.	<i>Saussurea atkinsonii</i> C.B.Clark	Asteraceae	Lokat, Baklol	Common
48.	<i>Saussurea heteromalla</i> (D.Don)Hand-mazz	Asteraceae	Batola, Dashund	Common
49.	<i>Solidago virgaurea</i> Linn.	Asteraceae	Thanthaana, Sondandi, Kanakshalakha	Common

50.	<i>Tarracetum dolichophyllum</i> (Kitam)Kitam	Asteraceae	Lidd guggli, chinnparni	Abundant
51.	<i>Taraxacum officinale</i> Webr.	Asteraceae	Handri, Hand, Dullal	Common
52.	<i>Tragopogon dubius</i> Scop.	Asteraceae	Thulkal,Girginok	Common
53.	<i>Tussilago Farfara</i> Linn.	Asteraceae	Chilchiloti, Ghudkhura	Threatened
54.	<i>Asyneuma thomsonii</i> (HK.f.et.Th.)Bornm	Campanulaceae	Branzbooti,Branzhaak	Threatened
55.	<i>Campanula aristata</i> Wall	Campanulaceae	Padi-branz	Common
56.	<i>Campanula cachmeriana</i> Royle.	Campanulaceae	Kashir branz	Common
57.	<i>Campanula lotifolia</i> L.	Campanulaceae	Branz ghainti	Common
58.	<i>Codonopsis ovata</i> Benth.	Campanulaceae	Tokerkachh, Dodad	Threatened
59.	<i>Androsace rotundifolia</i>	Primulaceae	Golpattri tuttan	Common
60.	<i>Androsace sempervivoids</i>	Primulaceae	Ashamkund	Abundant
61.	<i>Primula macrophylla</i> D.Don	Primulaceae	Kaangla-Naakla,	Common
62.	<i>Primula rosea</i> Royle.	Primulaceae	Mundaal, peetsevti	Common
63.	<i>Cynanchum arnottianum</i>	Asclepiadaceae	Dudhad	Threatened
64.	<i>Cynanchum auriculatum</i>	"	Dudhad	Threatened
65.	<i>Gantiana marginata</i> (. Don)	Gentianaceae	Neelkanth, Shirkanth	Common
66.	<i>Nymphoides peltata</i> (S.	Menyanthaceae	Lidd khur	Common
67.	<i>Asperugo procumbens</i> L.	Boraginaceae	-	Common
68.	<i>Cynoglossum lanceolatum</i>	Asclepiadaceae	Khitdi	Common
69.	<i>Onosma hispidum</i> Wallich	Asclepiadaceae	Ratanjot, loljad	Threatened
70.	<i>Veronica biloba</i> Linn.	Scrophulariaceae	Titni	Common
71.	<i>Veronica persica</i> Poiret.	Scrophulariaceae	Ashvashaak	Common
72.	<i>Pedicularis pectinata</i> Wallich	Scrophulariaceae	Kankatyukaparn,	Common
73.	<i>Orobanche solmsii</i> C.B.Clark	Orobanchaceae	Lothus, Jadkhaar	Common
74.	<i>Petracanthus utricifolius</i>	Acanthaceae	Pardaad,Mauhwa,	Common
75.	<i>Verbena officinalis</i> Linn.	Verbenaceae	Bareen	Abundant
76.	<i>Nepeta erecta</i> (Benth) Benth.	Lamiaceae	Neelpat, Bidaal Parnaas	Common
77.	<i>Nepeta lacvigata</i> (D.Don.)	Lamiaceae	Neelpat, Gandhsoi	Common
78.	<i>Rumex acetosa</i> Linn.	Plygonaceae	Ulloh, Tsoktsin	Common
79.	<i>Rumex nepalensis</i> Sprengel.	Plygonaceae	Ubaj, Chooka	Abundant
80.	<i>Euphorbia helioscopia</i> L.	Euphorbiaceae	Dudhi, Gur sutchsul,	Common
81.	<i>Euphorbia plorifera</i> hook f.	Plygonaceae	Dudhli, Dudhi	Common
82.	<i>Parieteria lusitanica</i> linn	Urticaceae	-	Common
83.	<i>Epipactis royleana</i> Lindley.	Orchidaceae	Amarkand,phullchamba	Common
84.	<i>Spiranthes sinensis</i>	Plygonaceae	Muchhmarool,	Abundant
85.	<i>Iris germanica</i> L.	Iridaceae	Majaarmund, Sosem	Common
86.	<i>Hemerocallis fulva</i> Linn.	Liliaceae	Riudd, Sunaari	Common
87.	<i>Juncos articulatus</i> Linn.	Juncaceae	Pranad, Tillar	Common
88.	<i>Carex stenophylla</i>	Cyperaceae	Phikal	Abundant
89.	<i>Kobresia laxa</i> Nees.	Cyperaceae	Kubber	Threatened
90.	<i>Scripus setaceus</i>	Cyperaceae	Kaseru, Ghussad	Common
91.	<i>Eriocaulon cinereun</i>	Eriocaulaceae	Irka	Common
92.	<i>Agrostis pilosula</i>	Poaceae	Ghaas	Abundant
93.	<i>Datylis glomerata</i>	Poaceae	Trakkad,	Common

94.	<i>Digitaria</i>	Poaceae	Chhal, Trakkad	Common
95.	<i>Phleum alpinum</i>	Poaceae	Jaamno gha	Common
96.	<i>Poa alpine Linn.</i>	Poaceae	Humulu, Shaadal	Common

Source: Management Plan of Dachigam National Park 2011-2016.

Monitoring of Flora of Project Site:

The site study was conducted in order to assess the Flora distribution around 10 km radius of Project site. The Frequency, Abundance Density, Relative Density, Relative Dominance and IVI values were determined.

Table: 3.24 List of shrubs with sampling data

S.No.	Shrubs Species	Frequency	Abundance	Density	Relative Density	Relative Dominance (Crown Area – meter)	Rel. Dominance	IVI
1.	<i>Acanthus aspera</i>	0.8	16.63	13.3	0.48	0.10	0.0008	1.28
2.	<i>Barleria cristata Linn.</i>	0.8	15.25	12.2	0.44	0.20	0.0016	1.25
3.	<i>Berberis lyceum Royle</i>	0.8	3.63	2.9	0.11	0.10	0.0034	0.91
4.	<i>Calotropis procera R.Br.</i>	0.7	19.14	13.4	0.49	0.20	0.0015	1.19
5.	<i>Camabis sativa Linn.</i>	0.7	14.43	10.1	0.37	0.10	0.0010	1.07
6.	<i>Carrisa opaca Stapf.</i>	0.7	13.29	9.3	0.34	0.10	0.0011	1.04
7.	<i>Clematis buchananiana DC.</i>	0.8	14.38	11.5	0.42	0.20	0.0017	1.22
8.	<i>Colebrookea appositifolia Smith</i>	0.7	15.00	10.5	0.38	0.10	0.0010	1.08
9.	<i>Cotoneaster microphyllous Wall</i>	0.8	14.75	11.8	0.43	0.20	0.0017	1.23
10.	<i>Dodonaea viscosa Jacq.</i>	0.8	12.63	10.1	0.37	0.30	0.0030	1.17
11.	<i>Flacourtia indica Merr.</i>	0.8	13.75	11.0	0.40	0.40	0.0036	1.20
12.	<i>Lantana camara</i>	0.8	16.63	13.3	0.48	0.50	0.0038	1.29
13.	<i>Prinsepia utilis Royale</i>	0.8	10.25	8.2	0.30	0.70	0.0085	1.11
14.	<i>Wooffordia fruticosa Linn.) Kurz</i>	0.8	7.38	5.9	0.21	0.70	0.0119	1.03
	Total	9.2	169.48	129.4	5.22	2.50	0.0241	14.44
		Frq. Class D & E						

Table: 3.25 List of trees with sampling data

S.No.	Botanical name of Tree sps	Frequency	Abundance	Density	Relative Density	Relative Dominance (Crown area (m))	Rel. Dominance	IVI
1.	<i>Abiies pindow</i>	0.8	4.13	3.3	0.12	1.00	0.03	0.95
2.	<i>Pinus excelsa</i>	0.8	2.75	2.2	0.08	1.50	0.07	0.95
3.	<i>Ulmus wallicgiana</i>	0.8	3.63	2.9	0.11	1.00	0.03	0.94
4.	<i>Pyrus malus</i>	0.7	4.86	3.4	0.12	0.50	0.01	0.84



5.	<i>Populus caspica</i>	0.7	3.00	2.1	0.08	1.00	0.05	0.82
6.	<i>Betula utilis D.Dun</i>	0.7	1.86	1.3	0.05	0.80	0.06	0.81
7.	<i>Quercus robber</i>	0.8	1.88	1.5	0.05	1.50	0.10	0.95
8.	<i>Morus nigra</i>	0.7	2.29	1.6	0.06	1.20	0.08	0.83
9.	<i>Cedrus deodara G</i>	0.8	2.25	1.8	0.07	0.60	0.03	0.90
10.	<i>Celtis australis Linn</i>	0.8	1.38	1.1	0.04	0.70	0.06	0.90
11.	<i>Delbergia sisso</i>	0.8	2.50	2.0	0.07	1.00	0.05	0.92
12.	<i>Ficus benghalensis</i>	0.8	1.25	1.0	0.04	1.50	0.15	0.99
13.	<i>Salix alba Linn</i>	0.8	1.63	1.3	0.05	0.70	0.05	0.90
14.	<i>Sapindus mukorossi</i>	0.8	1.38	1.1	0.04	1.20	0.11	0.95
15.	<i>Taxus wallichiana(T)</i>	0.8	1.13	0.9	0.03	1.30	0.14	0.98
	Total	11.6	35.88	27.5	1.00	15.50	1.04	13.64
		Frq Class C & D						

It is assess the vegetation type is Heterogeneous in nature which indicate diversified of flora presence. Non of the species reported endangered and Rare as per Schedule V and VI no threats from Project activities. All the species are normally found in this habitat.

List of fauna at study area:

Mammals present in the study area are as follows:

S. No.	Common Name	Scientific Name	WL Schedule
1.	Jackal	<i>Canis aureus</i>	-
2.	Himalayan wolf	<i>Canis lupus</i>	I
3.	Hangul or Kashmir Stag	<i>Cervus elaphus hanglu</i>	I
4.	Jungle Cat	<i>Felis chaus</i>	-
5.	Indian porcupine	<i>Hystrix indica</i>	-
6.	Rhesus macaque	<i>Macaca mulatta</i>	-
7.	Himalayan yellow-throated Marten	<i>Martes flavigula</i>	-
8.	Himalayan Musk Deer	<i>Moschus chrysogaster</i>	I
9.	Himalayan weasel	<i>Mustela sibirca</i>	-
10.	Serow	<i>Capricornis sumatraensis</i>	I
11.	Himalayan Mouse Hare	<i>Ochotona roylei</i>	-
12.	Common Leopard	<i>Panthera pardus</i>	I
13.	Leopard Cat	<i>Felis bengalensis</i>	I
14.	Kashmir Gray Langur	<i>Semnopithecus ajax</i>	-
15.	Himalayan Brown Bear	<i>Ursus arctos isabellinus</i>	I
16.	Asiatic Black Bear	<i>Ursus thibetanus</i>	-
17.	Red Fox	<i>Vulpes vulpes</i>	-

Source: Management Plan of Dachigam National Park 2011-2016.

Out of 17 mammals, 07 mammals are categorized under schedule-I of the wildlife protection act 1972.



List of Birds present in the study area are as follows:

Family	COMMON NAME	Scientific Name	Status
Family-Accipitridae			
1.	Black Kite	<i>Milvus migrans</i>	R
2.	Sparrow Hawk	<i>Hieraeetus nisus nisosimilis</i>	RM
3.	Booted Eagle	<i>Hieraeetus pennatus</i>	RM
4.	Golden Eagle	<i>Aquila chrysaetos</i>	R
5.	Eurasian Griffon	<i>Gyps fulvus</i>	RM
6.	White-Rumped Vulture	<i>Gyps bengalensis</i>	R
7.	Bearded Vulture	<i>Gypaetus barbatus</i>	R
Family-Falconidae			
8.	Common Kestrel	<i>Falco tinnunculus</i>	RM
Family- Phasianidae			
9.	Snow Partridge	<i>Lerwa lerwa</i>	R
10.	Himalayan Snowcock	<i>Tetraogallus himalayensis</i>	R
11.	Chukar	<i>Alectoris chukar</i>	R
12.	Western Tragopan	<i>Tragopan melanocephalus</i>	R
13.	Himalayan Monal	<i>Lophophorus impejanus</i>	R
14.	Koklass Pheasant		R
Family-Columbidae			
15.	Snow Pigeon	<i>Columba leuconota</i>	R
16.	Rock Pigeon	<i>Columba livia</i>	R
17.	Oriental Turtle Dove	<i>Streptopelia orientalis</i>	RM
18.	Eurasian Collared Dove	<i>Streptopelia decaocto</i>	R
19.	Red Collared Dove	<i>Streptopelia tranquebarica</i>	R
20.	Spotted Dove	<i>Streptopelia chinensis</i>	R
Family-Psittacidae			
21.	Rose-Ringed Parakeet	<i>Psittacula krameri</i>	R
22.	Slaty-Headed Parakeet	<i>Psittacula himalayana</i>	R
23.	Indian Cuckoo	<i>Cuculus micropterus</i>	RM
24.	Eurasian Cuckoo	<i>Cuculus canorus</i>	RM
Family- Strigidae			
25.	Eurasian Eagle Owl	<i>Bubo bubo</i>	R
26.	Little Owl	<i>Athene noctua</i>	R
27.	Long-Eared Owl	<i>Asio otus</i>	RM
Family- Aodidae			
28.	Himalayan Swiftlet	<i>Collocalia brevirostris</i>	R
29.	Alpine Swift	<i>Tachymarptis melba</i>	RM
30.	Common Swift	<i>Apus apus</i>	M
31.	House Swift	<i>Apus affinis</i>	RM
Family-Alcedinidae			
32.	Pied Kingfisher	<i>Ceryle rudis</i>	R
33.	Common Kingfisher	<i>Alcedo atthis</i>	RM
34.	White-Throated Kingfisher	<i>Halcyon smyrnensis</i>	R
Family-Coraciidae			
35.	European Roller	<i>Coracias garrulus</i>	RM
Family- Upupidae			



36.	Common Hoopoe	<i>Upupa epops</i>	RM
Family- Picidae			
37.	Eurasian Wryneck	<i>Jynx torquilla</i>	M
38.	Scaly-Bellied Woodpecker	<i>Picus squamatus</i>	R
39.	Grey-Headed Woodpecker	<i>Picus canus</i>	R
40.	Himalayan Woodpecker	<i>Dendrocopos himalayensis</i>	R
Family- Alaudidae			
41.	Crested Lark	<i>Melanocorypha bimaculata</i>	R
Family- Hirundinidae			
42.	Dusky Crag Martin	<i>Hirundo concolor</i>	R
43.	Barn Swallow	<i>Hirundo rustica</i>	RM
44.	Striated Or Redrumped Swallow	<i>Hirundo daurica</i>	R
Family- Oriolidae			
45.	Eurasian Golden Oriole	<i>Oriolus oriolus</i>	RM
Family- Surnidae			
46.	Common Starling	<i>Sturnus vulgaris</i>	RM
47.	Common Myna	<i>Acridotheres tristis</i>	R
48.	Jungle Myna	<i>Acridotheres fuscus</i>	
Family- Corvidae			
49.	Yellow-Billed Blue Magpie	<i>Urocissa flavirostris</i>	R
50.	Rufous Treepie	<i>Dendrocitta vagabunda</i>	R
51.	House Crow	<i>Corvus splendens</i>	R
52.	Large-Billed Crow	<i>Corvus macrorhynchos</i>	R
53.	Nutcracker	<i>Nuctifraga caryocatactes</i>	
54.	Yellow-Billed Or Alpine Chough	<i>Pyrrhocorax graculus</i>	
55.	Eurasian Jackdaw	<i>Corvus monedula</i>	
56.	Raven	<i>Corvus corax</i>	
57.	Jungle Crow	<i>Corvus macrorhynchos</i>	
Family-Pycnonotidae			
58.	White-Cheeked Bulbul	<i>Pycnonotus leucogenys</i>	
59.	Black Bulbul	<i>Hypsipetes madagascariensis</i>	R
Family- Muscicapidae			
Sub. Family- Timalinae			
60.	Jungle Babbler	<i>Turdoides striatus</i>	
61.	Striated Laughing Thrush	<i>Garrulax striatus</i>	
62.	Variegated Laughing Thrush	<i>Garrulax ariegatus</i>	
63.	Streaked Laughing Thrush	<i>Garrulax lineatus</i>	
Sub. Family-Muscicapinae			
64.	Kashmir Redbreasted Flycatcher	<i>Muscicapa subrubra</i>	
65.	Little-Pied Flycatcher	<i>Muscicapa westermant</i>	

66.	White-Browed Blue Flycatcher	<i>Muscicapa superciliaris</i>	
67.	Slaty Blue Flycatcher	<i>Muscicapa leucomelanura</i>	
68.	Verditer Flycatcher	<i>Muscicapa thalassina</i>	
69.	Grey-Headed Flycatcher	<i>Culicicapa ceylonensis</i>	
70.	Paradise Flycatcher	<i>Terpsiphone paradist</i>	RM
Sub. Family-Sylvina			
71.	Plain Leaf Warbler	<i>Phylloscopus neglectus</i>	R
72.	Tytler's Leaf Warbler	<i>Phylloscopus tytleri</i>	R
73.	Tickell's Leaf Warbler	<i>Phylloscopus affinis</i>	R
74.	Sulphur-Bellied Warbler	<i>Phylloscopus griseolus</i>	RM
75.	Yellow-Browed Warbler	<i>Phylloscopus inornatus</i>	R
76.	Lemon-Rumped Warbler	<i>Phylloscopus chloronotus</i>	R
77.	Blyth's Leaf Warbler	<i>Phylloscopus reguloides</i>	RM
78.	Gold Crest	<i>Regulus regulus</i>	
Sub. Family-Turdinae			
79.	Orange-Flanked Bush Robin	<i>Tarsiger cyanurus</i>	
80.	Blue-Capped Redstart	<i>Phoenicurus caeruleocephala</i>	R
81.	Black Redstart	<i>Phoenicurus ochruros</i>	R
82.	White-Winged Redstart	<i>Phoenicurus erythrogastrus</i>	
83.	Plumbeous Water Redstart	<i>Rhyacornisfuliginosus</i>	R
84.	Little Forktail	<i>Enicurus scouleri</i>	M
85.	Spotted Forktail	<i>Enicurus maculates</i>	
86.	White-Capped Water Redstart	<i>Chaimarrornis leucocephalus</i>	R
87.	Blue Rock Thrush	<i>Monticola solitarius</i>	R
88.	Blue Whistling Thrush	<i>Myophonus caeruleus</i>	R
89.	Grey-Winged Blackbird	<i>Turdus boulboul</i>	
90.	Chestnut Thrush	<i>Turdus rubrocanus</i>	
Family-Troglodytidae			
91.	Winter Wren	<i>Troglodytes troglodytes</i>	
Family- Cinclidae			
92.	White-Throated Dipper	<i>Cinclus cinclus</i>	
93.	Brown Dipper	<i>Cinclus pallasii</i>	
Family- Prunillidae			
94.	Alpine Accentor	<i>Prunella collaris</i>	
95.	Altai Accentor	<i>Prunella hamalayana</i>	
Family- Paridae			
96.	Grey Tit	<i>Parus major</i>	
97.	Green-Backed Tit	<i>Parus moniticolus</i>	
98.	Crested Black Tit	<i>Parus melanolophus</i>	
99.	Black Tit	<i>Parus rufonuchalis</i>	
100.	Yellow-Cheeked Tit	<i>Parus xanthogenys</i>	
101.	Fire-Capped Tit	<i>Cephalopyrus flammiceps</i>	
102.	White-Throated Tit	<i>Aegithalos niveogularis</i>	
Family- Sittidae			

103.	European Nuthatch	<i>Sitta europaea nagansis</i>	
104.	White-Cheeked Nuthatch	<i>Sitta leucopsis</i>	
Family-Certhidae			
105.	Tree Creeper	<i>Certhia familiaris</i>	
106.	Himalayan Tree Creeper	<i>Certhia himalayana</i>	
Family-Motacillidae			
107.	Yellow Wagtail	<i>Motacilla flava</i>	
108.	Grey Wagtail	<i>Motacilla cinerea</i>	
109.	Pied Or White Wagtail	<i>Motacilla alba</i>	
110.	Large Pied Wagtail	<i>Motacilla maderaspatensis</i>	
Family-Zosteropidae			
111.	White Eye	<i>Zosterops palpebrosa</i>	
Subfamily-Passerinae			
112.	House Sparrow	<i>Passer domesticus</i>	
113.	Russet Sparrow	<i>Passer rutilans</i>	
114.	Eurasian Tree Sparrow	<i>Passer montanus</i>	
Family-Campephagidae			
115.	Scarlet Minivet	<i>Pericrocotus flammeus</i>	
116.	Long-Tailed Minivet	<i>Pericrocotus ethologus</i>	
117.	Small Minivet	<i>Pericrocotus cinnamomeus</i>	
Family-Emberizidae			
118.	Pine Bunting	<i>Emberiza leucocephalos</i>	
119.	White-Capped Bunting	<i>Emberiza stewarti</i>	
120.	Grey-Necked Bunting	<i>Emberiza bunchanani</i>	
121.	Rock Bunting	<i>Emberiza cia</i>	

Source: Management Plan of Dachigam National Park 2011-2016.

List of Butterfly species recorded from study area:

Family	Common name	Scientific name	Status
Papilionidae	1. Common Yellow Swallowtail	<i>Papilio machaon</i> (Linnaeus)	Common
Pieridae	2. Large Cabbage White	<i>Pieris brassicae</i> (Linnaeus)	Common
	3. Indian Cabbage White	<i>Pieris canidia</i> (Sparrman)	Common
	4. Bath White	<i>Pontia daplidice</i> (Linnaeus)	Common
	5. Common Gull	<i>Cepora nerissa</i> (Fabricius)	Common
	6. Dark Clouded Yellow	<i>Colias fieldii</i> (Menetries)	Common
Lycaenidae	7. Common Brimstone	<i>Gonepteryx rhammi</i> (Linnaeus)	Common
	8. Pale Clouded Yellow	<i>Colias erate</i> (Esper)	Common
	9. Common Copper	<i>Lycaena phlaeas</i> (Linnaeus)	Common
	10. White-Bordered Copper	<i>Lycaena pavana</i> Kollar	Common
	11. Dark Grass Blue	<i>Zizeeria karsandra</i> (Moore)	Common
	12. Indian Cupid	<i>Everes lacturnus</i> (Godarts)	Common
	13. Red Pierrot	<i>Talica niseus</i> (Guerin-meneville)	Common
	14. Dusky Hedge Blue	<i>Oreolyce vardhana</i> (Moore)	Common

	15. White Hedge Blue	<i>Udara akasa</i> (Horsfield)	Common
	16. Plain Hedge Blue	<i>Celastrine Lavendularis</i> (Moore)	Common
	17. White-Disc Hedge Blue	<i>Celatoxia albidisca</i> (Moore)	Common
	18. Orange Bordered Argus	<i>Aricia astrarche</i> (Bergsasser)	Common
	19. Plains Cupid	<i>Chilades pandava</i> (Horsfield)	Common
	20. Lime Blue	<i>Chilades lajus</i> (Stoll)	Common
Nymphalidae	21. Common Beak	<i>Libythea lepita</i> (Moore)	Common
	22. Club Beak	<i>Libythea myrrha</i> (Godart)	
	23. Striped Tiger	<i>Danaus genutia</i> (Cramer)	Common
	24. Plain Tiger	<i>Danaus chrysippus</i> (Linnaeus)	Common
	25. Great Satyr	<i>Aulocera padma</i> (Kollar)	Common
	26. Common Satyr	<i>Aulocera swaha</i> (Kollar)	Common
	27. Common Fivering	<i>Ypthima baldus</i> (Fabricius)	Common
	28. Common Fourring	<i>Ypthima huebneri</i> (Kirby)	Common
	29. Himalayan Fivering	<i>Ypthima sacra</i> (Moore)	Common
	30. Common Threering	<i>Ypthima asterope</i> (Klug)	Common
	31. Large Threering		Common
	32. Western Fivering		
	33. Common Wall		
	34. Indian Fritillary	<i>Argyreus hyperbius</i> (Linnaeus)	Common
	35. large silver stripe	<i>Chidrena children</i>	Common
	36. Small Leopard	<i>Phalantha alcippe</i> (Stoll)	
Nymphalidae	37. Common Leopard	<i>Phalanta phalantha</i> (Drury)	Common
	38. Indian White Admiral	<i>Limenitis trivena</i> (Moore)	Common
	39. Himalayan Sergeant	<i>Athyma opalina</i> (Kollar)	Common
	40. Common Sailer	<i>Neptis hylas</i> (Linnaeus)	Common
	41. Short-Banded Sailer	<i>Phaedyma columella</i> (Cramer)	Common
	42. Indian Purple Emperor	<i>Apatura ambica</i> (Kollar)	Common
	43. Painted Lady	<i>Vanessa cardui</i> (Linnaeus)	Common
	44. Indian Tortoiseshell	<i>Aglais casmiriensis</i> (kollar)	Common
	45. Mountain Tortoiseshell	<i>Aglais urticae</i> (Linnaeus)	Rare
	46. Comma Tortoiseshell	<i>Nymphalis vau-albm</i>	Rare
	47. Eastern Comma	<i>Polygonia egea</i> (Cramer)	Common
	48. Blue Admiral	<i>Kaniska canace</i> (Linnaeus)	Common
	49. Red Admiral		
	50. Blue Pansy	<i>Junonia orithia</i> (Linnaeus)	Common
	51. Chocolate Pansy	<i>Junonia iphita</i> (Cramer)	Common
	52. White Commodore	<i>Parasarpa dudu</i> (Doubleday)	
	53. Ringed Argus	<i>Callerebia ananda</i> (Moore)	
	54. Small Grass Yellow		
	55. Green-veined white	<i>Pieris napi</i> (Linnaeus)	
	56. Himalayan Blackvein	<i>Aporia leucodice</i> (Eversmann)	

Source: Management Plan of Dachigam National Park 2011-2016.

3.10 SOCIO-ECONOMIC ENVIRONMENT

Any developmental activity exerts a direct impact on the socio-economic environment of the region. Generally, the beneficial impacts such as better job opportunities, improved education, communication, energy, housing, health, transportation facilities etc. outweighs the adverse impacts, if any. The study of socio-economic component of environment incorporates various facets, demographic structure, availability of basic amenities such as housing, education, health and medical services, occupation, water supply, sanitation, communication and power supply, prevailing diseases in the region as well as features such as places of tourist attraction and monuments of archaeological importance. The study of these parameters helps in identifying predicting and evaluating the likely impacts due to project activity in the surrounding region. The present study on the socio-economic environment includes existing status of the socio-economic profile of the area within 10 Kms of the mining area. The project is proposed for mining of Mineral Lime Stone Mine over an area of 21.106 Ha. with production capacity of 53,055 TPA(ROM) in near Village-chakdura, Bathon, Khrew, Tehsil-Pampore, District-Pulwama (Jammu and Kashmir) By Mushtaq Muzafar Anim. It is an opencast mechanized mining project to excavate Mineral Lime Stone. The socio-economic survey was carried out to identify and understand the various issues through pre-designed questionnaire. The public opinion were ascertained and recorded. The land for mining lease area is mostly barren land and issues like land acquisition, displacement, compensation, resettlement and rehabilitation (R& R) and not envisaged. Baseline data on demographic pattern, occupational status, education, health facilities and other amenities as existing in the study area have been collected.

Methodology applied for selection of sample & data collection

The methodology which is applied for primary source of data collection i.e. gathering data through field survey for socio-economic environment is depicted below:

Sampling Method

A judgmental and purposive sampling method was used for choosing respondents of various sections of the society i.e. Sarpanch, adult males and females, teachers, medical practitioners, businessmen, agriculture laborers, unemployed group etc. Judgmental and purposive sampling method includes the right cases from the total population that helps to fulfill the purpose of research needs.

Data Collection Method

Data collection through primary source, framing methods is used:

Field Survey and Observations

Field survey and observations are made at each sampling village and the socio-economic status of that region is studied. Visits are made to hospitals, primary health centers and sub-centers to know the health status of the region. Various Governmental organizations such as Statistical Department, Census Department were visited to collect the requisite information of that region.

Interview Method

Structured interview method is used to collect data regarding the awareness and opinion from the samples selected from the various socio- economic sections of the community. Structured interviews involve the use of a set of predetermined questions that includes fixed and alternative questions. The questionnaire mainly highlights the parameters such as income, employment and working conditions, housing, food, water supply, sanitation, health, energy, transportation and communication, education, environment and pollution to assess the standard of living of that particular region and general awareness, opinion and expectation of the respondents about the proposed project. Interview method helps to collect more correct and accurate information as the interviewer is present during the field survey.

Socio-economic survey was conducted in 7 villages located in all directions within the 10 kms radius of the study area. The respondents were asked about their awareness / opinion about the existing stone quarries and also of their opinion about the positive and negative impacts of the stone quarries viz. job opportunities, education, health care, housing, transportation facility and economic status etc.

The salient observations recorded during the socio economic survey in the study areas are presented below:

- Livelihood of the villagers is primarily based on agriculture and its allied activities. Majority of main workforce are engaged in other activities which may also include mining activity
- Majority of cultivation is depended on rainfall as the irrigation facility is insignificant
- The area under saffron cultivation during was 2414 hectares. Among the fruits, apple, almonds, walnut and cherry are the important one produced in this region.
- Most of the villages have Primary School (PS), Middle School (MS) and in a few villages' have Secondary School. For higher education boys and girls have to go to the nearest town places i.e Khrew, Pampore and Tral which is about 15-20 kms.
- Nearest town from the project site is Khrew which is about 7 kms from village Bathon
- The main source of drinking water supply is through tap, well, hand pump, but majority of the respondents expressed dissatisfaction opinion about the availability of adequate drinking water
- The Government medical facilities in the form of primary health sub- centre and private medical representatives are available in the villages. Villagers expressed positive opinion regarding the facilities available at the centre. ANM (Auxiliary Nurse Midwife) frequently visits all the villages for regular vaccination and health checkup. Health camps are organized by the health centre and Gram Panchayats from time to time for the benefit of the village people
- Two wheelers, taxis and public transport (bus) facility are the main mode of transportation used by natives in the study area
- Power supply is mostly available in all the sampling villages. Street lights are also available in all villages but frequent power cut / load shedding problem is experienced by the people. Electricity is available for mostly 8-10 hours a day
- Wood, kerosene and LPG gas are the major fuel used for cooking purpose
- Majority of surveyed population gave positive response on continuation of mining activity, as most of the local population will get employment either as contractors, drivers, or laborers and the activity will help in development of auxiliary as well as ancillary jobs in the region.
- Limestone mining activity is predominant in most of the villages of the study area
- As per the information the mining activity may employ mining workers other than the supervisory staff. The 39 labours employed shall be from the nearby villages. Half of them are skilled labours and the other half shall be unskilled labour.

Baseline Status

The latest available data has been compiled to generate the existing socio-economic scenario of the study area. Relevant information on socio-economic profile was collected from the Primary Census Abstract CD 2011 that includes the population details of the region while Village Amenities 2011 has been referred to for the details of basic amenities available in the region

Demographic Structure

Demographic structure of the study area was assessed for the selected parameters viz. households, population, sex ratio, scheduled caste, scheduled tribes, literacy, occupational pattern and employment from primary census abstract, CD 2011. The summarized demographic structure of the study areas in comparison with Pulwama district is enclosed as **Annexure-XI**.

Household and Population

The total population of district Pulwama as per 2011 Census was 560440, out of which 293064(52.29%) were male and 267376 (47.70%) were female. Sex ratio (number of female per thousand male) of Pulwama District



as a whole was 912. The literacy rate of Pulwama District was 63.48%. Scheduled Caste and Scheduled Tribe population of the district is 0.07% and 4.03% respectively.

Sex Ratio

According to 2011 census, 29 villages are coming within the 10 km radius from the mine site from Pampore Tehsil of Pulwama District that covers 7512 Households with total population of about 47698 out of which male constitute 25288 (53.01%) and female constitute 22410 (46.98%) of the population. The family size is about 6.3 persons residing in each family. The average sex ratio in the villages is about 886 females per thousand males which is lower than the district sex ratio. The population of 0-6 years age-group is about 15.25% of the total population and the child sex ratio is about 907 which higher than the sex ratio of the study area. Scheduled caste population is nil while the Scheduled Tribes covers 10.27 % of the study area. 24691 i.e 51.76% population are literates in the study area..

Literacy

A person who can both read and write with understanding of any one language is treated as "Literate". 51.76% population are literates in the study area.

Occupational Pattern

Occupational Pattern of any region mainly depends upon its economically active group i.e. the working population involved in productive work. 'Work' has been defined as participation in any economically productive activity. Such participation may be physical or mental. Persons on leave and under training are also treated as workers. However, rent receivers and pensioners are not treated as workers. There are different types of workers that may be classified as -

Main Workers

Main workers are those who have worked for a major part of the year (i.e. at least six months or 183 days). Main activity of a person who was engaged in more than one activity was reckoned in terms of time disposition. The total population in the main worker category of Pulwama District was 33.62% while that of the study area is only 18.95%. This shows that the employment condition of the study area is lower than the district. It is observed through the data that most of the population in the study of the total main worker category area are engaged in other activities that is about 80.17% while in Pulwama district the major occupation of people is both agriculture (Cultivators 33.62%) and other activities (49.88%)

Marginal Workers

Those workers who had not worked for the major part of the reference period (i.e. less than 6 months) are termed as Marginal Workers. Work is defined as participation in any economically productive activity with or without compensation, wages or profit. Such participation may be physical and/or mental in nature. Work involves not only actual work but also includes effective supervision and direction of work. It even includes part time help or unpaid work on farm, family enterprise or in any other economic activity. All persons engaged in work as defined above are workers. In the study area 10380 i.e 21.76% population are engaged as marginal workers.

Non-Workers

Non-Workers may be defined as those persons who have not worked at all during the entire year under the reference period. The proportion of non workers may show the unemployment level of the region. The non worker population of Pulwama district was 66.38 %. While the non worker category in the study area is about 59.287%. This shows that though the population is employed mostly as marginal workers the non- worker population is higher in district.

Economic Resource Base

The major crops grown in the study area are Paddy, Maize, Mustard, Potato, Saffron, Vegetables and fruits crops are the major crops grown in the district. There is also a big scope for wheat cultivation and adopting Paddy – Wheat Double Cropping system, which will in turn help in raising the existing cropping intensity of 152% to 180%. Besides, there is also a handsome potential for Bee-Keeping, Mushroom Cultivation, Floriculture, Vermi composting, Organic farming and cultivation of Medical and Aromatic plants (MAP). Mining activities play an important role in increasing the economic resource base of the people in this region.



Socio-economic Survey

In order to access and evaluate likely impacts arising out of any development projects on socio economic environment, it is necessary to gauge the apprehensions of the people in the study areas.

3.11 SUMMARY

The generation of primary data as well as collection of secondary data and information from the site and surroundings was carried out during pre monsoon season i.e. **March to May 2016**. The EIA study is being done for the Mine Lease (core zone) and area within 10 Km distance from mine lease boundary (buffer zone), both of which together comprise the study area. The mine lease area exhibits plain to undulated topography. The project site falls under seismic zone IV which is a high damage risk zone (MSK VIII). The minimum and maximum concentrations of PM10 for all the **7 AAQM** stations **45.2 µg/m³ and 76.3 µg/m³** respectively and the minimum and maximum concentrations of PM2.5 for all the 7 AAQM stations were found to be **23.6 µg/m³ and 56.3 µg/m³** respectively. The range of Free Silica in PM10 was found to be **2.0% to 2.7%**. Ambient Air Quality Monitoring reveals that the minimum and maximum concentrations of SO₂ were found to be 6.00 µg/m³ and 10.6 µg/m³ respectively. The prescribed CPCB limit of 80 µg/m³ for residential and rural areas has never surpassed at any station. The minimum and maximum concentrations of NO₂ were found to be 13.1 µg/m³ and 29.00 µg/m³. Ambient noise levels were measured at 4 locations around the proposed project site. Fluoride concentration in all the samples ranged from **0.17 to 0.19 mg/L** in surface water and **0.21 to 0.32 mg/L** in ground water in the study area of the mine site. Chloride is important in detecting the contamination of ground water. Its concentration increase rates of corrosion of metals in the distribution system. The permissible limit of chloride in drinking water is 250 ppm. The chloride concentration in water samples from all the locations ranged from **20.64 to 25.21mg/L** in surface water and **37.56 to 48.70** in ground water. Specific conductivity is a measure of total dissolved solids present in water and it ranges from **266.00 to 270.00 mg/L** in surface water **199.00 to 410.00 mg/L** in ground water. Thus noise levels at all 4 locations were observed to be within the prescribed limits. **Analysis results of 7 ground water samples and 2 surface water samples reveal that; pH varies from 7.16 to 7.79 in groundwater and 7.63 to 7.98 in surface water. Total Hardness varies from 101.54 to 168.16 mg/L in groundwater and 116 to 196.00 mg/L.** The LOS value from the proposed mining will be same as earlier values for NH-1 A and MDR-1. So the additional load on the carrying capacity of the concern roads is not likely to have any significant adverse affect. Random soil samples were collected up to depth of 15 cm and homogenized samples were then sent to the laboratory for analysis. The analysis results of 4 soil samples show that soil is basic in nature as **pH value ranges from 6.63 to 7.66 with organic matter 0.29% to 0.72%**. The concentration of **Nitrogen 181.00 kg/ha to 260.10 kg/ha, Phosphorus 28.58kg/ha to 58.13 kg/ha** and **Potassium- 76.80 kg/ha to 90.00 kg/ha** has been found to be in good amount in the soil samples. Soil texture is Silty Loam to Sandy.



CHAPTER: 4

ANTICIPATED ENVIRONMENTAL IMPACT AND ITS MITIGATION MEASURES

4.0 INTRODUCTION

The environmental parameters likely to be affected by mining are related to many factors, *i.e.* physical, social, economic, agriculture and aesthetic. Opencast mining involves drilling, blasting, loading and transport of overburden and ore. The excavated Mineral will be transported via trucks to outsiders. The operations may disturb environment of the area in various ways, such as removal of mass, change of landscape, flora and fauna of the area, surface drainage, and change in air, water and soil quality. While for the purpose of development and economic up-liftment of people, there is need for establishment of mining industries, but these should be environment friendly. Therefore, it is essential to assess the impacts of mining on different environmental parameters, before starting the mining operations, so that abatement measures could be planned in advance for eco-friendly mining in the area. The likely impacts on different environmental parameters due to this mining project are discussed below.

4.1 ENVIRONMENTAL IMPACT ASSESSMENT

Environment and development should be considered as mutually complementary, interdependent, and an instrument of reinforcing the quality of life. Environmental Impact Assessment (EIA) is the important aspect of overall environmental management strategy and an important tool for sustainable development. It identifies major impacts of mining and associated activities on environment and provides guideline to prepare the necessary control measure termed as Environmental Management Plan (EMP).

Alteration or modification of the above attributes may cause hazardous impact on ecological equilibrium of site. Besides this there will be some other reasons which will affect the environment viz. traffic network, and other vehicular movements, impacts on flora and fauna of that area, surface drainage, and change in air, water and soil quality. While for purpose of development and economic upliftment of people, there is need for establishment of industries and mining, but these have to be environmental friendly. Therefore, it is essential to assess the impacts of mining on different environmental parameters, before starting the mining operations, so that abatement measures could be planned in advance for eco-friendly mining in the area. The increasing awareness among the people about ecological imbalance and environmental degradation has raised many apprehensions. The impacts on different environmental parameters due to this mining project are discussed below:

4.1.1 CONSTRUCTION PHASE

This is a Limestone mining project .There will be no impacts as no construction stage is envisaged in this project.

4.1.2 OPERATION PHASE

Some of the impacts identified in various phases of operation are insignificant and do not warrant much attention whereas some others are important especially with respect to the present context. Therefore objective is to identify those impacts, which are significant and require a detailed analysis for decision making or formulating adequate management measures. This section deals with an assessment of impact of various mining activities on the existing environmental conditions. The methodology of assessment is based upon identification and description of the existing project activities as well as environmental components followed by evaluating the impact of mining and associated activities on the environment. The environmental components that are likely to be influenced or modified by the continuation of project activities are:

- i. Air Environment,
- ii. Water Environment,



- iii. Soil Environment,
- iv. Noise and Vibration Environment,
- v. Land Use,
- vi. Hydrology
- vii. Geology,
- viii. Solid Waste/overburden
- ix. Risk Assessment/ OH&S
- x. Biological Environment,
- xi. Socio-economic Environment.

4.2 PREDICTION OF IMPACTS AND MITIGATION MEASURES

The area pollution is in the form of dust, fumes and gases generated by mining machineries and during different mining operations. The dust once allowed to go into atmospheric cannot be controlled hence it's desirable not to allow them to be formed and Suppressed at the generating source.

4.2.1 Impacts of Air Pollution and Its Mitigation Measures

Surface mining, including opencast mining has always been a source of dust generation. The various pollutants like SPM, SO₂ and NO₂ are not expected to have considerable variation from the existing levels within study area which are generally below the limits specified by CPCB. The pollutant levels within lease area will not rise considerably and are expected to confirm to the permissible limits with proper mitigation measures.

In this mining project the only source of emission is excavation, transportation, loading, hauling operation and handling of mineral.

The likely sources of air pollution with respect to activities are:

- Operation of diesel based equipment like excavator, loader truck tractors-trolley and tippers etc.
- Transportation of mineral
- Drilling, Blasting, hauling and spillage of waste during loading and unloading handling.
- Air pollution from unpaved roads and surface.

4.3 Air Pollution Modelling

A) ISCST3 Dispersion Model

The Industrial Source Complex (ISC) Short Term model provides options to model emissions from a wide range of sources that might be present at a typical industrial source complex. ISCST3 is US-EPA approved model to predict the air quality. The model uses urban dispersion and regulatory defaults options as per guidelines on air quality models (PROBES/70/1997-1998). Emission sources are categorized into four basic types of sources, i.e., point sources, volume sources, area sources, and open pit sources. The volume source option and the area source option may also be used to simulate line sources. The model assumes receptors on flat terrain. The ISC short term area source model is based on a numerical integration over the area in the upwind and cross wind directions of Gaussian plume formula. This can be applied to the Point, Area, Line or Volume sources simultaneously and their resultant incremental concentration of the pollutant can be predicted.

Model Options Used For Computations

The options used for short-term computations are:

- The plume rise is estimated by Briggs formulae, but the final rise is always limited to that of the mixing layer;
- Stack tip down-wash is not considered;
- Buoyancy Induced Dispersion is used to describe the increase in plume dispersion during the ascension phase;
- Calms processing routine is used by default;



- It is assumed that the pollutants do not undergo any physio-chemical transformation and that there is no pollutant removal by dry deposition;
- Washout by rain is not considered;
- Flat terrain is assumed / used for computations;
- Cartesian co-ordinate system has been used for computations; and
- The model computations have been done for 10 km with 100 m grid interval.

B) CALINE 4 model

The California Line Source Dispersion Model, CALINE4 (1989), uses traffic emissions, site geometry and meteorology to predict air pollutant concentrations within 500 meters of the roadways. Predictions can be made for carbon monoxide, nitrogen dioxide and suspended particles.

C)Gaussian Plume Model

Ground Level Concentration (χ) (GLC) from a point source at any receptor is given by -

$$\chi = \frac{Qg_1g_2}{(2 \pi \sigma_y \sigma_z u)} \quad \text{--- (USEPA ISCST3, 1987)}$$

where,

$$g_1 = \exp(-y^2/2\sigma_y^2)$$

$$g_2 = \exp[-(z-H)^2/2\sigma_z^2] + \exp[-(z+H)^2/2\sigma_z^2]$$

Q = source strength

Z = receptor height above the ground

H_e = effective stack height (Plume rise + Physical stack height)

u = wind speed at stack level

σ_y and σ_z = dispersion parameters

4.3.1 Model Setup

4.3.1.1 Emission of PM₁₀

The major sources of PM₁₀ emission in case of mining project are the loading activity at mine site (loading of material over dumpers by excavators) and the movement of vehicles on unpaved haul roads. The emission rates for these sources are given in latest USEPA's AP-42 guidelines.

4.3.1.2 Loading of Material

The Lime Stones will be loaded on dumpers using excavators. It will be used for loading Lime stone during the working shift of 8 hours/day. The PM₁₀ emission rate due to loading activity is calculated using below equation.

$$E = k \times 0.0016 \times ((U/2.2)^{1.3} / (M/2)^{1.4}) \quad \text{--- AP42 (Nov 2006)}$$

Where,

E = Emission Factor, kg/ton

k = Particle size multiplier, 0.35 for PM₁₀

M = Moisture Content, %

u = Mean wind speed, m/s

4.3.1.3 Emission of PM₁₀ due to Transportation

The hauling of Lime Stones from the mine lease area to the end users via haul road (unpaved road) will cause emission of particulate matters. This emission will be limited to the extent of unpaved haul road starting from mining pit to nearest paved road connectivity. As per the mining plan the material will be transported during the working shift only. Each day maximum 3 dumpers (6 tonne capacity each) will make trips for transporting Lime Stones. The following empirical expressions is used to estimate the quantity in pounds (lb) of size-specific particulate emissions from an unpaved road in industrial sites, per vehicle mile



traveled (VMT)

$$E = k (s/12)^a (W/3)^b + C \quad \text{--- AP42 (Nov 2006)}$$

Where

k, a, b are empirical constants i.e. different for different particle size.

E = size-specific emission factor (lb/VMT)

s = surface material silt content (%)

W = mean vehicle weight (tons)

C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear, 0.0047 lb/VMT for PM10. The source characteristics s and W are referred to as correction parameters for adjusting the emission estimates to local conditions. The effective emission rate after considering reduction in emission potential of haul roads due to water sprinkling was calculated for use in CALINE4 model.

4.3.1.4 Emission of CO from Vehicles

The Lime Stones will be transported outside the mining area for end use. Each day maximum 3 dumpers will be used for transportation. In order to estimate the emission of CO from these vehicles exhaust ARAI-2007 emission factors were used in CALINE4 model. The ARAI emission factors for CO emitting from heavy vehicles (diesel) is 3.92 gm/km or 6.32 g/mile.

4.3.1.5 Summary of calculated Emission Rates

Table 4.1: Emissions Rates

S. No.	Activities	Units	Emission Rates
1.	Loading	g/s	0.01014
2.	Transportation on Haul Road (PM10 Emission)	g/mile/vehicle	80.0745
3.	Transportation (CO Emission)	g/mile/vehicle	6.32

4.3.3 MODELING METHODOLOGY

4.3.3.1 ISCST3 Model Input Parameters

The ISCST3 model was used to predict the GLC of PM10 due to loading activity at mine site. Lime Stones will be transported by trucks. Loaded trucks will travel on Kuccha road made for plying of trucks. No. of such temporary road will provide access to the movement of loaded trucks. Point source resembling loading activity at mine site and having equivalent emission rates were setup in mining lease to predict the maximum incremental concentration of PM10 at baseline monitoring location. The predicted incremental concentration PM10 was added to baseline concentration to obtain the cumulative concentration level at baseline stations.

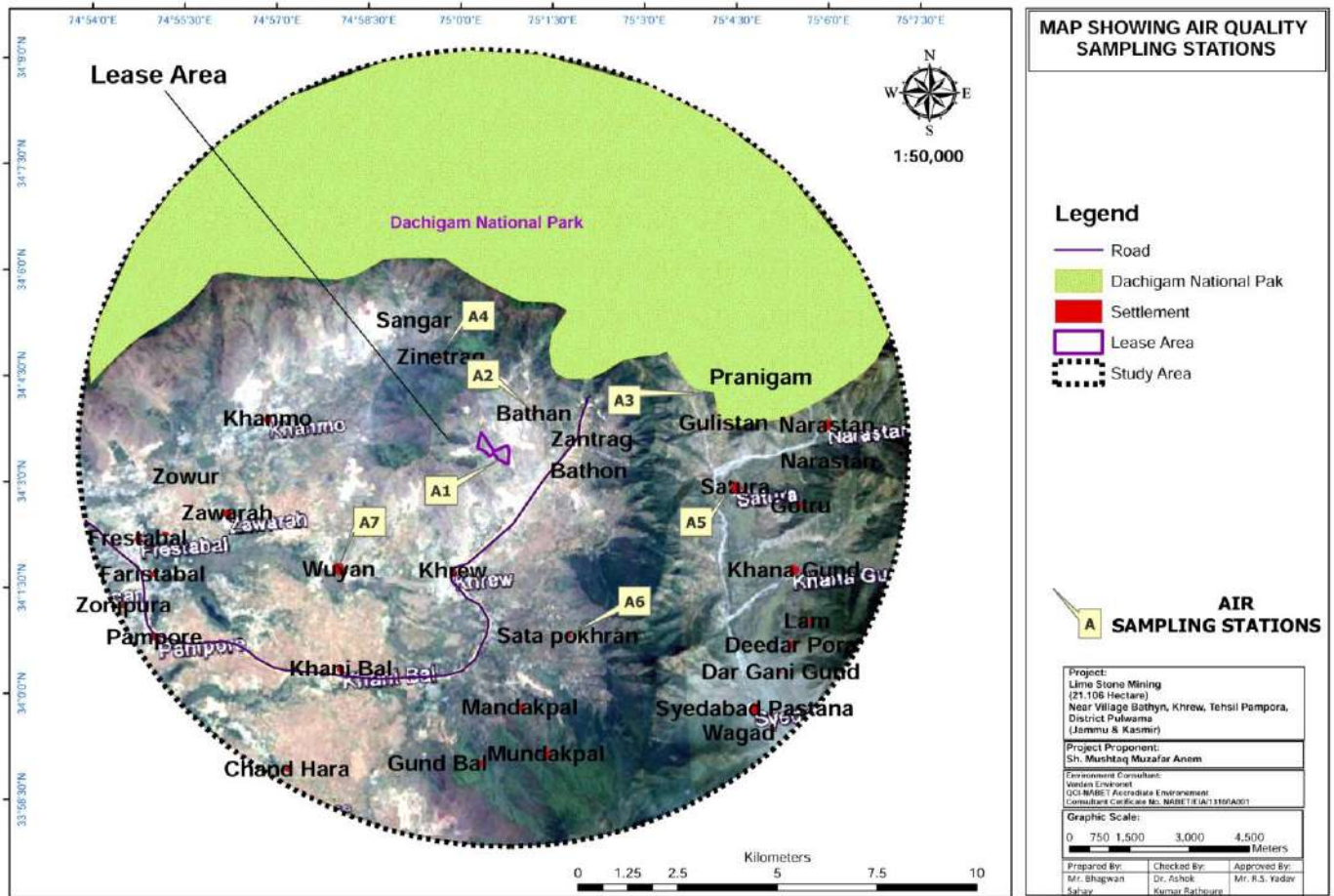


Figure 4.1 – ISCST3 Model Setup

4.3.3.2 CALINE4 Input Parameters

CALINE4 model was used to predict the worst case GLC of PM10 due to dumper movement on haul road (unpaved road) between the mine site and nearest paved road. In the present project, 3 dumpers having 6 tonne capacity have been proposed to transport the mined Lime Stones from mining area. The maximum number of dumpers proposed is 8 per day. The model was set-up with haul road links along the mining lease and receptors at all the AAQM locations to predict the pollutant concentration. Since CALINE4 has options to predict only 1-hour and 8-hour pollutant concentration, the model was used to predict 1-hour worst case GLC of pollutant which was later converted into 24-hour GLC using Turner Equation. The 24-hour incremental concentrations (predicted) of pollutants due to transportation were added to baseline concentrations to obtain the cumulative concentration levels.

4.3.3.3 Results

The maximum incremental concentration of PM10 wiz.1.05 ug/m³ was predicted inside the core zone near active mining area (loading locations). These loading locations are generally away from sensitive receptors (settlements etc.). As the distance from source increases, the incremental concentration of PM10 drops drastically due to settling of PM10 particles under gravity. A graphical representation of the variation of PM10 concentration w.r.t distance is presented 4.2.

As evident from the line graph, the maximum impact of loading activity at mine site is limited to 300m only. The predicted maximum incremental concentration due to transportation was found at A1 (Ambient Air Quality Monitoring Station - 1).



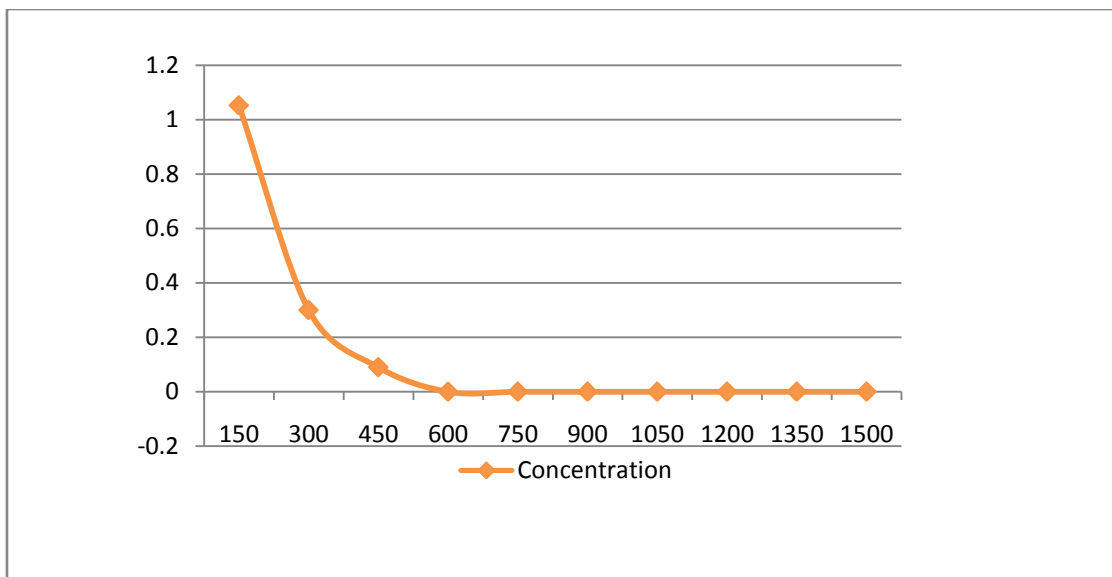


Figure.4.2. Incremental Concentration v/s Distance Graph

The predicted maximum cumulative GLC of PM10 was found to be 76.308 $\mu\text{g}/\text{m}^3$ at A5 (Ambient Air Quality Monitoring Station –5); which is lower than the permissible NAAQ standard for PM10 concentration (100 $\mu\text{g}/\text{m}^3$). The predicted 24 hours ground level concentrations at baseline air quality monitoring locations are presented in Table below. The graphical representation is given in Figure. The predicted concentration for CO was found to be 0.0 $\mu\text{g}/\text{m}^3$ owing to very less traffic to and from the mining area.

Table 4.2: Predicted GLC of PM₁₀ at Ambient Air Quality Monitoring Stations

Location Code	Location Name	Max Baseline Conc. ($\mu\text{g}/\text{m}^3$)	Predicted GLC ($\mu\text{g}/\text{m}^3$) – ISCST3 Model	Predicted GLC ($\mu\text{g}/\text{m}^3$) – CALINE4 Model	Cumulative GLC ($\mu\text{g}/\text{m}^3$)
A1	Project Site	59.8	1.052	0.47	61.322
A2	Near Village Bathan	56	0.058	0.015	56.073
A3	Near Village Pranigam	57.7	0.05	0.002	57.752
A4	Near Village Zinetrag	57.5	0.025	0.006	57.531
A5	Near Village Satura	76.3	0.006	0.002	76.308
A6	Near Village Sata Pokhran	56.3	0.005	0.004	56.309
A7	Near Village Wuyan	55.8	0.016	0.001	55.817



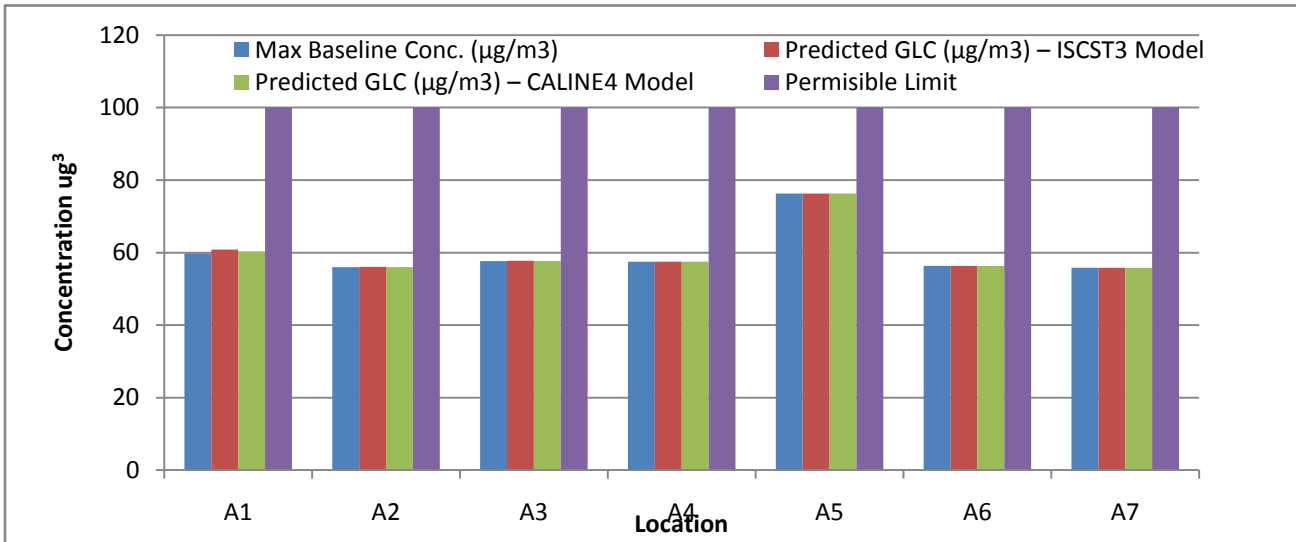


Figure 4.3: Graphical Representation of Model results

The contour maps showing the predicted concentration levels of PM₁₀ are presented in **Figure 4.3** and **Figure 4.4**.

Lime Stone Mining (21.106 Ha), Pulwama district
Isopleth of PM10

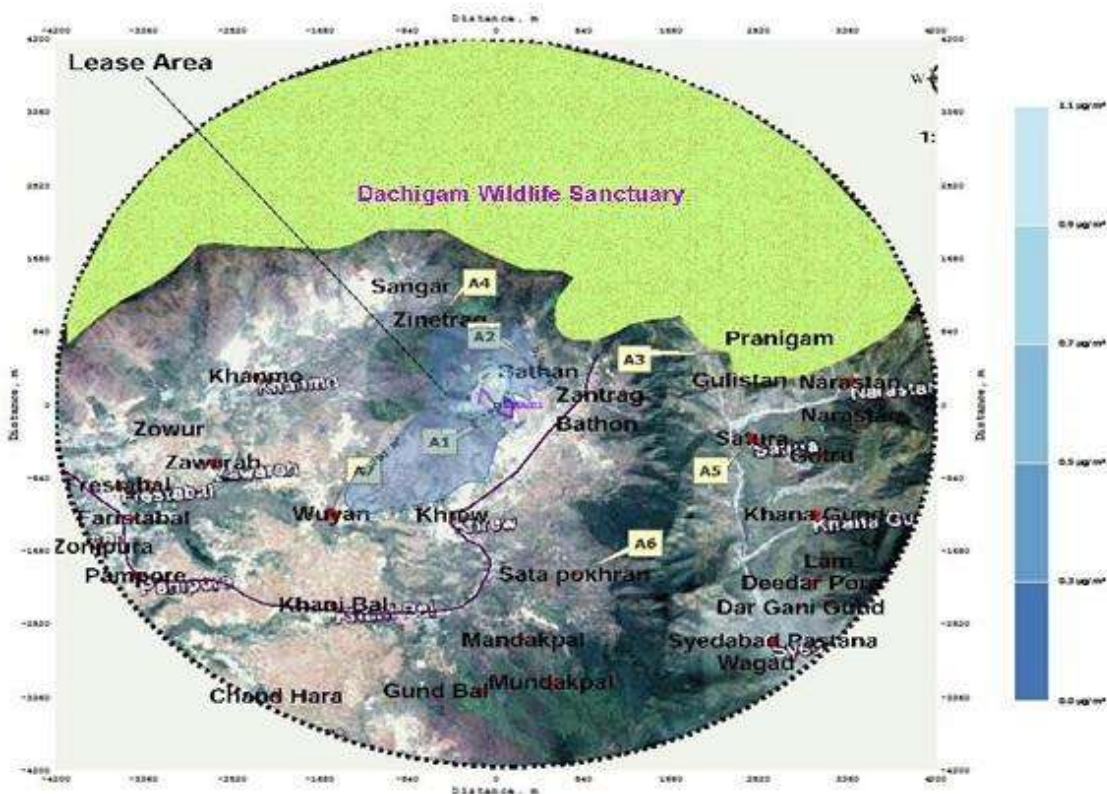


Figure 4.4: Spatial distribution of Predicted GLCs of PM10 due to Mining



Lime Stone Mining (21.106 Ha), Pulwama district
Isopleth of PM10 due to transportation

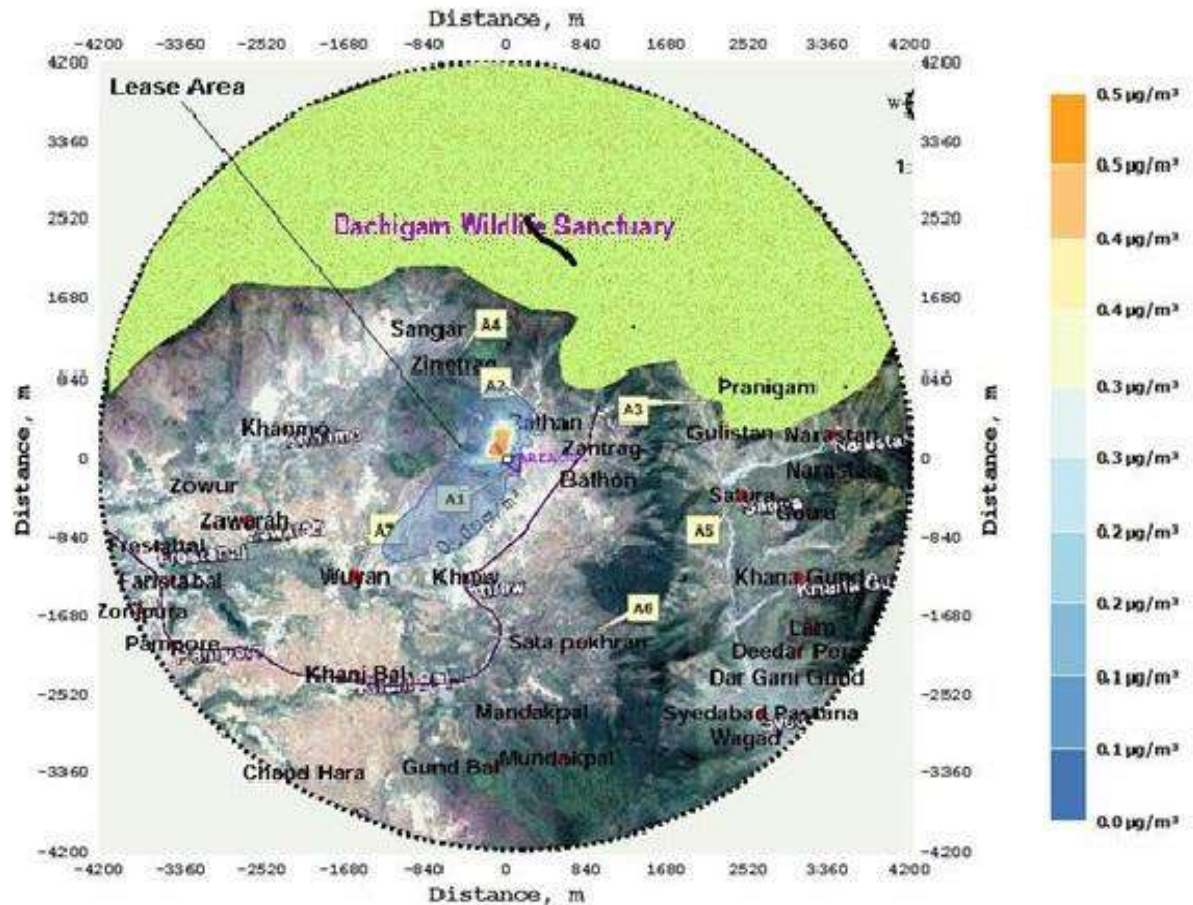


Figure 4.5: Spatial distribution of PM₁₀ GLC due to transportation

4.3.4 Conclusion

- From the results of ISCST3 and CALINE4 models, it is concluded that the maximum cumulative concentrations of PM10 both due to mining activities and transportation are expected to be within the prescribed standards for PM10. It is to be noted that the predicted concentrations from both mining activities and transportation are insignificant.
- The maximum impact of incremental concentration of PM10 due to loading activity at mine site is confined to limited distance (300m) only. Beyond 300m distance the concentration of PM10 due to mining activities is expected to be lower due to settlement of PM10 particles over short distances. The same is confirmed by the low predicted concentration levels of PM10 at ambient air quality stations (Figure 4 and Table 4).
- The incremental concentration due to transportation is limited to the length of unpaved haul road from the mining lease area until nearest paved roads.
- The concentration of CO due to vehicle exhaust is negligible due to small number of vehicles plying on haul road. The concentrations of SOx and NOx generated from mining area are expected to be low due to absence of any major source.



at the time of blasting, plantation of trees along haul roads, specially near settlements, to help to reduce the impact of dust on the nearby villages; planning transportation routes of mined material so as to reach the nearest paved roads by shortest route (minimize transportation over unpaved road); regular water sprinkling on unpaved roads to avoid dust generation during transportation etc.

4.5 IMPACT ON NOISE ENVIRONMENT AND MITIGATION MEASURES

4.5.1 Mathematical Noise Model

The resultant noise levels due to mining operations are calculated based on the mathematical expression as below –

$$L_2 = L_1 - 20 \log_{10}(R_2/R_1)$$

Where L_1 dB(A) = Noise level at a distance R_1 (m)

L_2 dB(A) = Noise level at a distance R_2 (m)

$$L = 10 \log_{10}(10^{L_1/10} + 10^{L_2/10} + 10^{L_3/10} + \dots + 10^{L_n/10})$$

Where L_1 , L_2 and L_n are noise level dB(A)

4.5.2 Noise Sources

The following sources of noise are expected to increase the noise levels in the mining zone as well as in the surrounding areas:

- Drilling;
- Blasting;
- Operation of (HEMM) Heavy Earth Moving and Mining Equipment;
- HEMMs; and
- Vehicular Movement

4.6 VIBRATION

4.6.1 Impact due to Ground Vibration

As per DGMS, a noise level of 90 dBA is stipulated in mines where HEMMs are to be operated. In order to assess the worst case noise levels in around the mining lease, a combined noise source having cumulative equivalent noise reference level of 100 dBA is considered to be located within the mine site. The results of mathematical calculation of predicted noise levels are presented in **Table 4.4**

Table 4.3 Permissible Peak Particle Velocity (mm/s)

Type of Structure	Dominant Excitation Frequency		
	<8 Hz	8 – 25 Hz	>25 Hz
A] Buildings/structures not belonging to the owner			
Domestic houses/structures (Kuchha brick and cement)	5	10	15
Industrial Buildings (RCC and framed structures)	10	20	25
Objects of historical importance and sensitive structures	2	5	10
B] Buildings belonging to owner with limited span of life			
Domestic houses/structures (Kuchha brick and cement)	10	15	25
Industrial Buildings (RCC and framed structures)	15	25	50

From the above table, it can be seen that the ambient noise levels (day time and night time) at all the locations will remain within permissible limits even when the project will be operational.

Although the noise level due to the operation of various mining machineries is taken as 100 db(A), the



noise level at different receptors is lower due to the large distance between source and receptors. It can be further concluded that in actual conditions due to presence of various topographical features in the path of sound propagation the noise levels will be further attenuated.

4.6.2 Mitigation Measures

The following control measures should be adopted to keep the ambient noise levels well below the limits.

- Drilling will be carried out with the help of sharp drill bits which will help in reducing noise;
- Secondary blasting shall be totally avoided and hydraulic rock breaker shall be used for breaking boulders;
- Controlled blasting with proper spacing, burden, stemming and optimum charge/delay shall be maintained;
- The blasting will be carried out during favorable atmospheric condition and less human activity timings;
- Minimum quantity of detonating fuse will be consumed by using alternatively excel non-electrical initiation system;
- Proper maintenance, oiling and greasing of machines at regular intervals shall be done to reduce generation of noise;
- The prime movers/diesel engines are properly maintained;
- Provision of sound insulated chambers for the workers deployed on machines (HEMM) producing higher levels of noise;
- Proper designing of plant & machinery by providing inbuilt mechanism like silencers, mufflers and enclosures for noise generating parts and shock absorbing pads at the foundation of vibrating equipment;
- Green Belt/Plantation shall be developed around the mining activity area and along haul roads. The plantation minimizes propagation of noise.

4.6.3 Measures to Control Ground Vibrations

The blasting operations in the mine are proposed to be carried out by deep hole drilling and blasting using delay detonators, which reduces the ground vibrations. The measures that are generally followed and currently proposed for abatement of ground vibration, air blast and fly rocks are detailed below:

- Proper quantity of explosive, suitable stemming materials and appropriate delay system shall be adopted to avoid overcharging and for safe blasting;
- Adequate safe distance from blasting shall be maintained;
- Blasting operations shall be carried out only during day time;
- The charge per delay shall be minimized and preferably more number of delays shall be used per blasts;
- During blasting, other activities in the immediate vicinity shall be temporarily stopped;
- Drilling parameters like overburden, depth, diameter and spacing shall be properly designed to give proper blast;
- Muffle blasting shall be adopted near structures, if any.



Impact	Mitigation Measure	Budget/annum
Noise from the drilling and blasting will cause some problem to the near inhabitants.	Drilling and Blasting will be done in scientific manner to reduce the noise level.	
Noise from the machinery can cause hypertension, high stress level, hearing loss, sleep disturbance etc due to prolonged exposure.	The machinery will be maintained in good running condition so that noise will be reduced to minimum possible level. Awareness will be imparted to the workers about the permissible noise level and effect of maximum exposure to those levels. Personal protective equipment will provide to prevent the noise exposure. Personal Protective Equipment will be provided during mining activity. Training will also given to Drivers for Vehicle movement.	Rs.0.75 Lakh Rs.2.25 Lakhs
No. of 15 PCU/hr will increase in the existing traffic due to this mining activity hence vehicle collision may occur unwanted sound and can also cause impact on human health.	In addition, truck drivers will be instructed to make minimum use of horns in the village area and sensitive zones. It is proposed to plant 1000 No. of local species per year with consultation of Forest department with some fruit bearing and medicinal trees, along the haul roads, outer periphery within the lease area to reduce the impact of noise in the study area. The trucks will be diverted on two roads viz. National Highway-1A, Major District Road towards Dachigam National Park to National Highway-1A.	Rs. 10.00 Lakhs

4.6.4 Conclusion

In summary, it can be stated that the impact on the present noise levels due to mining operations will be restricted to the work zone areas only. The impact on the ambient noise levels will not be felt at the settlement areas due to masking effect with the existing noise levels. The drilling and blasting envisaged in the stone mining so there is a impact of vibration due to this project and scientific manner of drilling and blasting will be done to controlled the impact of noise and vibration. Hence, the noise levels and vibration impact due to the proposed mining operations on community will be minimal.

4.7 Impact on Water Environment

There is no such impact on water environment. Assessment of the adverse impact and indicate the proposed mitigating steps to abate the likely adverse impact relating to the following:



4.7.1 Impact on Surface Water and ground water Environment

- **Surface Water:** The existing surface of the area is undulated and rugged with gentle to steep slopes. The gradient in southern part is gentler than the northern part. The prominent ridge is trending almost E-W with return valleys on either sides. The height level is at 2243 m RL in the north west portion of the area whereas lowest level is at 2046 m RL in the South east portion of the area. The general seasonal drainages of the area is heading towards south and southeast. These drainage courses ultimately merge into dry Nallah & Finally meet the river Jhelum, which is perennial source of water. there is no permanent water source or spring observed within the lease area.
The lessee shall make garland drain, retaining walls, setting tanks all around the pits and dumps. The rain water shall be utilized by harvesting techniques.
- **Ground Water:** The water table in the area is 10 m below the ground surface. There are no surface and ground water bodies with in the area. The only source of water shall be the rain water which too will flow down into the dry nallahs. The nallahs by and large flows from north to south direction ultimately flows down to meets river /Jhelum.

The surface run-off passing through the stacked overburden is likely to carry silt and fines in suspension thus polluting the water quality. At the project site Impact on Water Regime and Its Significance are given as under:

Table 4.4: Impact on Water Regime and Its Significance

Impact	Mitigation Measure	Budget/annum
The mining in the lease area may cause the ground water contamination due to intersection of the water table.	The water table will not be intersected during mining in the lease area as ultimate depth is limited upto 10 meters as the water table is 10 m bgl. Proper analysis/Monitoring will be done to check the ground water.	Rs.1.00 Lakh
The municipal waste water disposed from the mining activity may cause contamination of surface water.	The municipal wastewater will be disposed off into septic tanks and soak pit.	Rs. 2.00 Lakhs
Ground Water contamination due to discharge of mine run off.	No chemical having toxic elements will be used for carrying out mining activity. It is proposed to shape the landscape of the mine area and develop proper drainage system during working so as to avoid discharge of mine run off to any of the surface water channels.	---



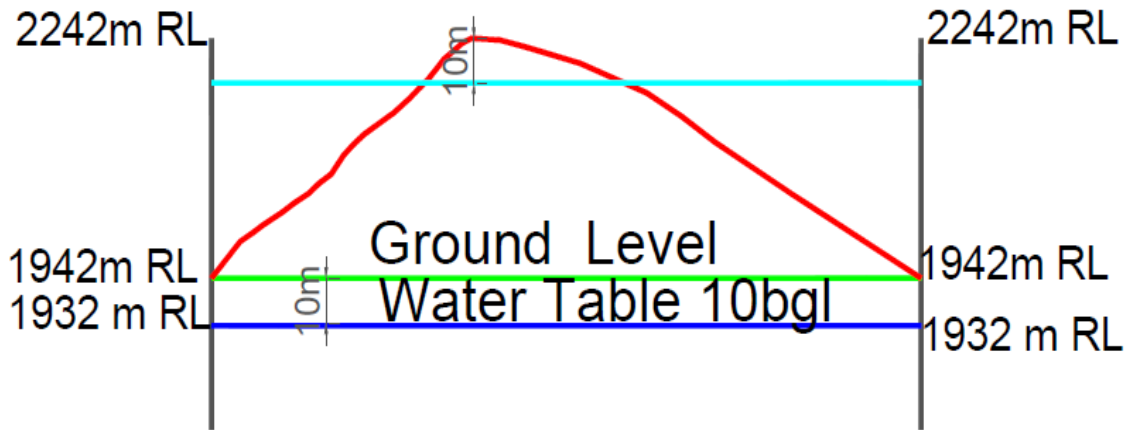


Figure 4.6: Impact of Mining on Ground Water

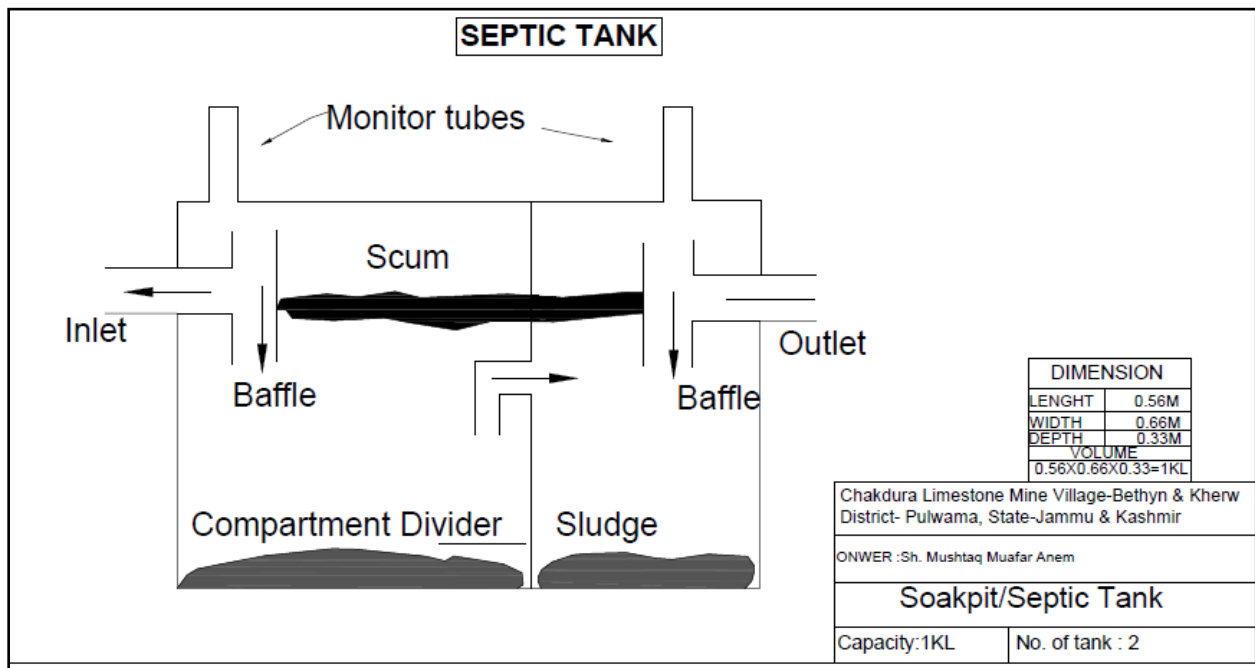


Figure 4.7: Design of Septic tank/Soak pit

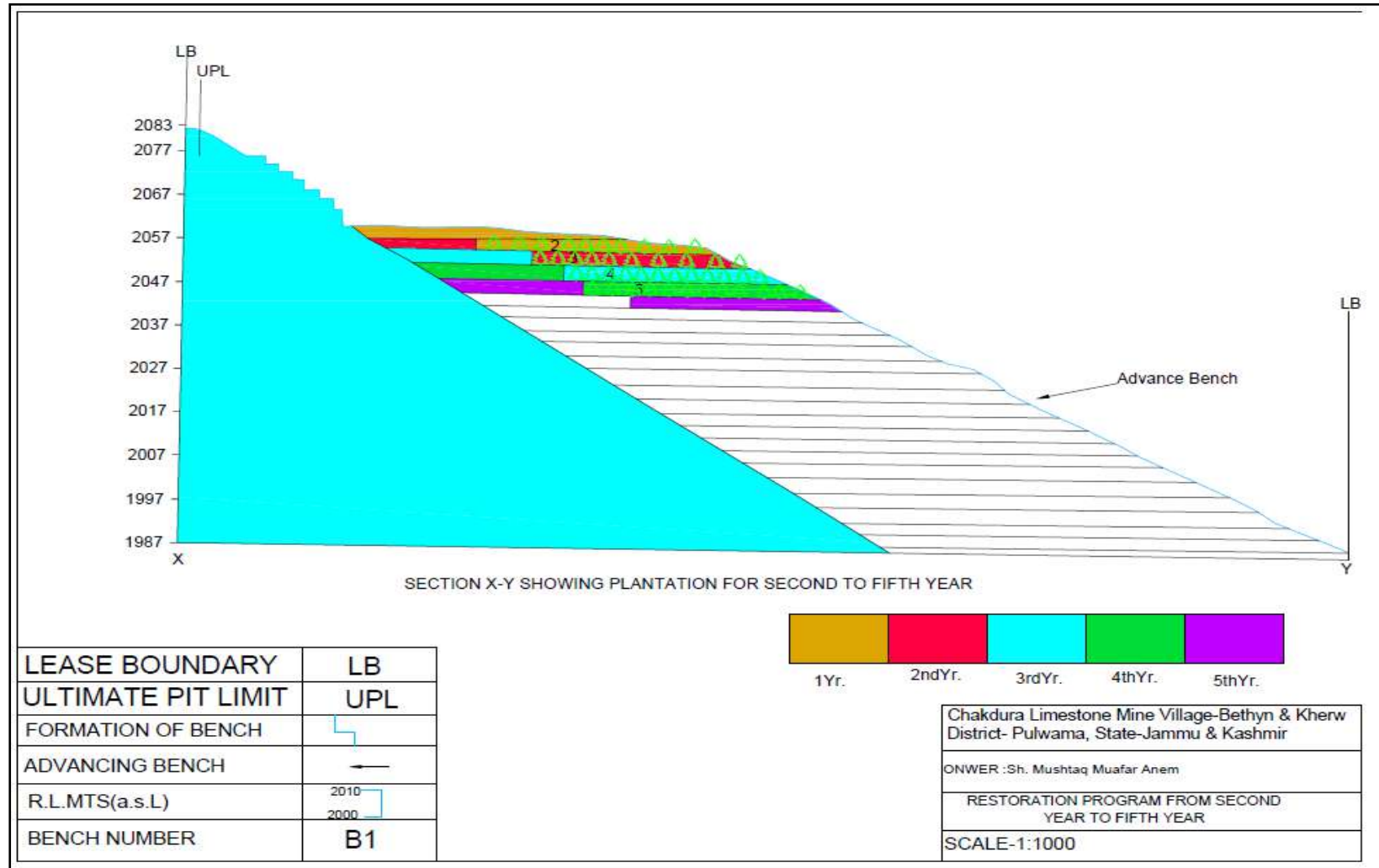


Figure 4.8: Restoration Program from Second Year to Fifth Year

4.7.2 Mitigation Measures

- Natural drainage system will be followed for rain water.
- No waste water will be generated from the mine.
- Natural pits will be used for rainwater harvesting.
- No toxic effluents will be generated.
- Regular monitoring of quality and quantity of ground water and surface water in the study area are proposed to be done.
- There is no surface water body and pond within the site.
- Water conservation measure will be followed.
- The mining pits will be properly benched; soil and waste dumps will be properly terraced with inward slope retaining walls at the toe so that there is no land slide during the rains and mixing of slits with flowing water thereof.
- As the man power likely to be from nearby villages, therefore discharge of domestic waste water will be limited can be easily controlled by Biotoilets

4.7.3 Conclusion

In this mining project in the entire lease period the ground water table will not be intersected hence there will be no impact on the water environment.

4.8 IMPACTS ON LAND USE

The project area does not consist of any forest land. It does not consist of any human habitations. Land use plan of the mining lease area during pre-operational, operational and post operational is incorporated in the **Chapter 2**.

Impact	Mitigation Measure	Budget/annum
The mining activity in the mine site will be converted into the pit. which may cause soil erosion, soil degradation etc.	It is proposed to plant 1000 Nos. of local species per year with consultation of Forest department with some fruit bearing and medicinal trees, along the haul roads, outer periphery within the mining area which enhances the binding property of the soil.	Rs. 10.00 Lakhs
Reclamation of land affected by mining activities during and at the end of mining lease period.	It is proposed to improve the effected land wherever possible for better land use, so as to support forestry and creation of water reservoir etc. Accordingly, the land reclamation portion shall be done by planting trees on the dumps along the roads surroundings the office building on the waste barren land and in the open pits when they reach their ultimate stage. The regular health checkup camp will be organized.	
Mining in the lease area may change complete land use pattern including topography, elevation, sediment transportation capacity etc.		

To counter balance the loss of Forest Land, following control measures have been proposed – Total 1000 trees/year will be planted. Proper protection devices for survival of trees will be provided. There will be separate watering arrangement. The dead plants will be replaced by fresh one in next monsoon.



Places of proposed plantation:

- Safety barriers.
- Both side of the road
- At the Dumps
- At the Govt. land provided by the Govt.

4.8.1 Conclusion

The lease area is in the outside riverbed and the some excavated land will get reclaimed with the help of soil hence there will be no impact on the land use.

4.9 IMPACTS ON SOIL ENVIRONMENT AND MITIGATION MEASURES

No major impact on soil of the study area is envisaged due to mining activities as there are no waste water, heavy metal, stack emissions and fugitive emission shall remain confined locally within working area and emission at haul roads will be controlled by water sprinkling and plantation.

Impact	Mitigation Measure	Budget/annum
Mining activity may increase the soil erosion and soil degradation which have adverse impact on soil fertility.	It is already proposed to plant 1000 No. of local species per year with consultation of Forest department with some fruit bearing and medicinal trees, along the haul roads, outer periphery within the mining area which enhances the binding property of the soil to check the erosion.	Rs. 10.00 Lakhs
	14.50 KLD water will be proposed for sprinkling on unpaved roads to avoid dust generation and soil erosion.	Rs 6.00 Lakhs
Top soil extraction from lease area may also affect the soil fertility and productivity.	Top soil will be removed in advance of the actual mining and will be stacked in a temporary stack yard. The same will be mixed with humus and organic fertilizer and utilized for plantation.	

4.10 HYDROLOGY

Impact	Mitigation Measure	Budget/annum
The mining in the mine site area may cause the ground water contamination due to intersection of the water table.	The water table will not be intersected during mining as ultimate depth is limited upto 10 meters as the water table is 10 m bgl. Proper analysis/Monitoring will be done to check the ground and surface water.	Rs.1.00 Lakh
Change the topography will divert the water flow.	There is no proposal of any stream modification/diversion due to this mining activity hence there will be no any impact on flow of water.	

4.10.1 Conclusion

The flow of surface/ground water (sub surface flow) is following the trend of topography, which is in the North to South direction. There is no proposal of any stream modification/diversion. Hence, there will be no any impact on hydrology of the study area. The depth of excavation in lease area is upto 55m



where ground water table is at 10 m bgl hence the water table is not expected to be intersected at any stage of mining.

4.11 Impact on Biodiversity due to Mining Activity

S.No	Impact	Mitigation Measure	Budget
1.	Explosive are proposed to use for blasting during mining activity. Vibrations of blasting at mine site can hinder the fauna in the area.	Blasting will do under controlled condition and vibrations will be minimized during the activity. The explosive will be supplied by the authorized contractor at the blasting site at the time of blasting. All precaution will do as per DGMS for safety of mine.	--
2.	Transportation of Lime Stone in the trucks/dumper will disturb the movement of Wild animals and reptiles.	Transportation of mineral will be minimise in the morning and evening and cannot be done in night.	-
3.	Fugitive emission from vehicle movement will form a layer in leaves thus reducing the gaseous exchange process. This ultimately affects the growth of plants and crop yield.	Haul roads will be sprinkled with water which would reduce the dust emission, thus avoiding damage to the crops. Plantation will be carried out on approach roads and nearby vicinity. Annual bio-monitoring of roadside plants exposed to vehicular pollution will be done to check the dust load and Air Pollution Tolerance Index (APTI).	8.00 Lakhs 10.00 Lakhs
4.	Chances of vehicle collisions with wildlife attempting to cross roads are possible.	Sign boards will be provided and low pressure horns will be used.	
5.	Any human settlement in the mining area will disturb the vegetation cover and reptiles.	No human settlement will be permitted in the lease mining or nearby area.	-
6.	The Indian peafowl movement is very common in the area; the noise from blasting and mining activity will hinder the same.	The latest equipment with sound-control devices should be used for blasting and mining activity and loading/unloading, etc. Use of exhaust silencers and optimized acoustical pipe lagging (acoustical wrapping) to minimize compressor noise. Green belt and community forestry will be encouraged to mitigate the noise level.	
7.	Mining may drive away the wild life from their habitat, and significantly affect wildlife and nearby residents.	If wildlife are noticed crossing the area, they will not be disturbed at all. Awareness program about wildlife and its importance will be conducted for workers and nearby residents so that they will not disturb the wildlife at all.	



4.12 IMPACTS ON SOCIO-ECONOMIC ENVIRONMENT AND MITIGATION MEASURES

Critically analyzing the existing environmental status of the socio-economic profile and visualizing the scenario with the project, the impacts of the project would be varied and may generate both positive and negative impacts of the cluster of mining activity in the region that are stated below.

Positive Impacts

No Rehabilitation

The villages and their inhabitants in the buffer zone will not be disturbed from their settlements due to the mining operations. There is no inhabitation within the lease area. Therefore neither villages nor any part of village or any hamlet will be disturbed during the entire life of the mine. As the mining operations will not disturb or relocate any village or settlement, no adverse impact is anticipated on any human settlement. The mining operation does not disturb/relocate any village.

Increase in Job Opportunities

As per the survey it has been observed that the population in general do not have opportunities of earning from employment and the non worker population is higher in the region so the mining operations in general will help to provide direct and indirect job opportunities for auxiliary and ancillary works etc

In the absence of any high employment potential activities due to low literacy level, the people are economically backward.

The mining operations will provide employment to 39 people that may help to improve the quality of life of the people in the study area.

No burden in the existing Infrastructure Facilities

Local work force will be given first preference in the mining activity due to which influx of the outsiders is not envisaged or it will be very minimal. Thus, there will not be the necessity of provision of housing facility for the local workers and not stressing on the existing civic amenities of the area. If sufficient number of local workers will not be available, then workers from outside will be engaged. For the outside workers if any, housing arrangement and the facilities will be provided at mine site.

Improvement in Infrastructure

Continued mining activities will benefit the local people due to provision of more infrastructural facilities (developments of approach routes within the village area, street light, health facilities etc.)

Improvement in local economy

Growth in the revenue generation to the local gram panchayats is very much anticipated.

Agriculture

The agricultural activities are seen in the areas where there is sufficient soil cover. The buffer zone will remain undisturbed and no adverse impact is envisaged.

Adverse Impacts:

- Mining activity also adds to the water pollution problems in the rivers, especially in the urbanized areas. It is sure that all these activities ultimately end up in the degradation of the rivers.
- Productivity of crops may be deteriorated affecting the agriculture based livelihood due to the pollution arising out of the mines, if proper mitigation measures are not implemented.
- Mining generates extra vehicle traffic, which negatively impairs the environment and also the local environment may be impacted. But to mitigate the impact trees will be planted on the part of mine contract area With the influx of population (truck drivers, attendant, and labour etc.) at the site, the risk of sexually transmitted diseases will increase in the area.



MITIGATION MEASURES OF SOCIO ECONOMIC ENVIRONMENT

- Adequate measures have been envisaged in the project design to control dust & noise. Proposed adequate & effective control measures will be provided which include dust suppression
- Well maintained tarpaulin covered trucks etc shall be used. Therefore, the likely adverse impacts on people, health, social and economic factors will be minimized
- Awareness programs shall be arranged on health, hygiene and sanitation
- Periodic health checkup camps, blood donation camps shall be organized by project authority for villagers, contract laborers, employees and their family
- Apart from the normal health check up, emphasis shall also be given to prevent specific diseases originating due to emission of different pollutants such as respiratory ailments, skin problems, water borne diseases, hearing abilities etc.
- Job oriented training courses must be organized through industrial / technical training institutions for educated youth like electrical, tailoring, plumbing, type writing, shorthand and machine repairing, welding fabrication, and other skill developing trades
- Whenever necessary, collaboration between project authority and local bodies will be done on regular basis with an objective to build and maintain a good relationship which is necessary for smooth functioning of the project as well as progress and welfare of the people in the study area
- Awareness programs will be taken to make people aware about the environmental protection, need of water conservation etc.
- Risks of accidents are expected during loading of minerals into truck/tractors-trolley and during transportation. This can be avoided by adopting good safety measures and practices.

Impact	Mitigation Measure	Budget
Impact on Human Settlement	The villages and their inhabitants in the buffer zone will not be disturbed from their settlements due to the mining operations. There is no inhabitation within the lease area. Therefore neither villages nor any part of village or any hamlet will be disturbed during the entire life of the mine. As the mining operations will not disturb or relocate any village or settlement, no adverse impact is anticipated on any human settlement.	-
Impact on Employment	As per the survey it has been observed that the population in general do not have opportunities of earning from employment and the non worker population is higher in the region so the mining operations in general will help to provide direct and indirect job opportunities for auxiliary and ancillary works etc. In the absence of any high employment potential activities due to low literacy level, the people are economically backward. The mining operations will provide employment to 39 people that may help to improve the quality of life of the people in the study area.	--



Impact on Infrastructure Facilities	Local work force will be given first preference in the mining activity due to which influx of the outsiders is not envisaged or it will be very minimal. Thus, there will not be the necessity of provision of housing facility for the local workers and not stressing on the existing civic amenities of the area. If sufficient number of local workers will not be available, then workers from outside will be engaged. For the outside workers if any, housing arrangement and the facilities will be provided at mine site.	--
Improvement in Infrastructure	Continued mining activities will benefit the local people due to provision of more infrastructural facilities (developments of approach routes within the village area, street light, health facilities etc.)	-
Impact on Human Health	Dust mask will be provided to the workers engaged at dust generation points like excavation and loading points. Regular water sprinkling on unpaved roads to avoid dust generation.	Rs. 2.25 Lakhs Rs. 6.0 Lakhs
The major source of socio-health impacts of transportation will generate from truck, dust etc. Increase in accidents as a result of rash driving of dumpers carrying mineral through the roads may be possible.	It is proposed to plant 1000 No.per /year of local species per year with consultation of Forest department with some fruit bearing and medicinal trees, along the haul roads, outer periphery within the mining area to control the dust. Planning transportation routes of mined material so as to reach the nearest paved roads by shortest route. Alternatively, graveled road may be constructed between mine lease area and nearest paved road connectivity; The speed of trucks plying on the haul road should limited to avoid generation of dust; and Covering of material during transportation on trucks to prevent spillage of stone from the trucks. The trucks will be covered by tarpaulin. Overloading will be avoided. Regular water sprinkling on unpaved roads to avoid dust generation during transportation;	Rs. 8.00 Lakhs - Rs. 6.0 Lakhs

4.13 IMPACTS DUE TO SOLID WASTE/OVERBURDEN AND MITIGATION MEASURES

Impact	Mitigation Measure	Budget/annum
The mine worker will generate municipal solid waste of about 10Kg per day which will have adverse impact on human health.	2 Nos. of Garbage bins will be provided for the safe disposal of solid waste.	The fund for this activity will be utilized from 'Mines and Mineral



Little amount of soil is also generated from joints and cracks.	The soil removed from mining area will be stacked seperately. The soil will stacked in a retaining wall and width of these walls will be 0.5 mtrs. at top and 1 meter at the bottom with a height of about 6 mtrs.	Development, Restoration and Rehabilitation fund'
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4.14 IMPACTS ON OCCUPATIONAL HEALTH AND SAFETY

To control and minimize the risks at workplace, lessee will implement Health, Safety and Environment Policy with the following objectives:

- To prevent hazards
- To provide safe and healthy environment to all the employees.
- To comply with the prevailing regulations and standards.

The lessee, therefore, will adopt the policy set below for the purpose of creating and maintaining safe and healthy environment. There are some health and safety hazards, which may affect the persons employed in the mine. The people may suffer from occupational diseases or may get injured while working in the mine, if proper measures will not be taken to protect the persons from these hazards.

Occupational health surveillance programme:

Occupational health surveillance programme will include the following facilities:

A. They will have Occupational Health Centre with emergency handling facilities.

B. The occupational health surveillance of the employee shall be done on a regular basis and records of the same will be maintained as per the Mining Act.

A. Exposure to Dust

Exposure to fine particulates is associated with work in most of the dust-generating stages notably from drilling and blasting, mineral handling, and transportation. Workers with long term exposure to fine particulate dust are at risk of pneumoconiosis, emphysema, bronchitis, and fibrosis. Methods to prevent and control exposure to dust include the following:

- Control of dust through water spraying,
- Closed cabins in HEMM;
- Maintenance of HEMM;
- Use of Personal protective equipment (PPE), as appropriate (e.g. masks and respirators) to address residual exposures.

B. Noise and Vibration Exposure

HEMM operation, drilling, blasting and transportation will be the main sources of noise and vibrations. Control of noise emissions includes the use of silencers, noise barriers, and personal hearing protection (ear plugs/muffs).

C. Physical hazards

Injuries during Project operation are typically related to slips and falls; contact with falling / moving objects; and lifting / over-exertion. Other injuries may occur due to contact with, or capture in, moving machinery (e.g. dump trucks, front loaders).

Following management measures are implemented to prevent the physical hazards:

Any person working on equipment with moving parts personally ensures that the equipment is de-energized, isolated and locked/tagged out when not in use.

In case of any accident immediate and proper medical care is provided at the mine site.



Impact	Mitigation Measure	Budget/annum
The mining of stone (minor mineral) can cause the lung disease and respiratory disorder due to dust exposure.	Dust masks will be provided as additional personal protection equipment (helmet and safety shoes) to the workers working in the dust prone area. Regular water sprinkling will be done and dust masks will be provided to the workers.	Rs.8.25 Lakhs
Due to noise exposure, hearing disorder may be resulted.	Ear-muffs will be provided to the workers and good maintenance of vehicles will be provided	
The accident at the site due to mining operation may be anticipated	Workers are informed, kept aware and trained about possible accidents during the mining operation and persona protective equipments will be provided viz. gloves, safety shoes, dust mask, safety jackets, helmet etc. In addition to, the awareness about the occupational health hazards due to mining activities to avoid any incident will be provided to the workers Pre- placement health checkup will be made mandatory and periodic heath checkup will be done quarterly.	

The detail of the proposed budget for the Occupational Health and Safety is given as in Chapter 10 of this EIA/EMP report.

4.15 TRAFFIC MOVEMET IMPACT AND MITIGATION MEASURES

Impact	Mitigation Measure	Budget/annum
No. of 15 PCU/hr will increase due to mining in existing traffic scenario lead to air pollution which can cause adverse effect on human health of neighboring villagers like effect on breathing and respiratory system, damage to lung tissue, cancer and premature death, influenza or asthma.	Vehicles with PUC Certificate will be hired. Regular maintenance of vehicles will be done to ensure smooth running of vehicle.	Rs. 10.0 Lakhs
	It is proposed to plant 1000 No. of local species per year with consultation of Forest department with some fruit bearing and medicinal trees, along the haul roads, outer periphery within the lease area to prevent the impact of dust in the nearby village. Regular Health checkup camps will be organized.	Rs.4.0 Lakhs



<p>No. of 15 PCU/hr will increase in the existing traffic due to this mining activity hence vehicle collision may occur unwanted sound and can also cause impact on human health.</p>	<p>In addition, truck drivers will be instructed to make minimum use of horns in the village area and sensitive zones.</p> <p>It is proposed to plant 1000 No. of local species per year with consultation of Forest department with some fruit bearing and medicinal trees, along the haul roads, outer periphery within the lease area to reduce the impact of noise in the study area.</p> <p>The trucks will be diverted on three roads viz Major District Road and NH-1A to avoid traffic congestion.</p> <p>Regular Health checkup camps will be organized.</p>	<p>Rs.10.0 Lakhs</p>
<p>Accidents may be occurring due to fast movement of vehicles.</p>	<p>To avoid accidents the speed of vehicles will be low near habitation areas.</p>	<p>Rs. 4.0 Lakhs</p>

4.16 IMPACTS ON GEOLOGY AND MITIGATION MEASURES

Impact	Mitigation Measure	Budget
<p>Slope of mining area will change which can create soil erosion and divert rain water runoff channel.</p>	<p>The maximum depth of mining in outside riverbed will not exceed 10 meters. The some excavated area will reclaim with help of soil hence no slope will be changed due to mining.</p>	<p>--</p>
<p>Soil weathering due to dumping and mining.</p>	<p>It is proposed to plant 1000Nos. of local species per year with consultation of Forest department with some fruit bearing and medicinal trees, along the haul roads, outer periphery within the mining area which enhances the binding properties of the soil.</p> <p>14.50 KLD water will be proposed for sprinkling on unpaved roads to avoid soil weathering.</p>	<p>Rs. 10.00 Lakhs</p> <p>Rs. 6.00 Lakhs</p>
<p>Change in topography can change the river flow and flood may occur.</p>	<p>Scientific mining has been proposed hence no any topographical change will occur during mining activity.</p> <p>Mining will be prohibited in monsoon season.</p>	<p>--</p>

4.17 MINE CLOSURE PLAN

4.17.1 General

Mine closure plan is one of the most important requirements in the environment management of mining projects. The closure operation is a continuous series of activities right from the commencement to decommissioning of the project. Therefore, progressive mine closure plan is specifically included in the mining plan, which is to be reviewed every five years in the scheme of mining. The primary aim is to ensure that the following broad objectives along with the abandonment of the mine can be successfully achieved:

- Creation of a productive and sustainable after-use for the site, acceptable to mine owners,



regulatory agencies, and most importantly to the community.

- Protection of public health and safety of the surrounding habitation.
- Minimization of environmental damage.
- Conservation of valuable attributes and aesthetics.
- Counter balancing the adverse socio-economic impacts.

4.17.2 Reason for Closure

The progressive mine closure plan has been prepared in compliance of Haryana Minor Mineral Concession Rules 2012 under MMCR 1986. No immediate closure is planned as sufficient reserves are available to carry on the activities. There is market potential in domestic demands.

4.17.3 Phase-Wise Plan of Restoration of Land Degraded by Mining

Our production detail for **first five year** is given below:

Year	ROM Limestone (Tonnes)	Saleable Ore (Tonnes)
2013-14	51438	51438
2014-15	53055	53055
2015-16	50760	50760
2016-17	50828	50828
2017-18	51165	51165
Total	257246	257246

Mineable Reserves= 36983444 T

Geological Reserves=43222636 T

These data are approved vide letter no. 614(2)/MS-B-235/13-DDN dated 6.11.2013.

4.17.4 Disposal of Mining Machinery

Machinery is proposed on hire basis. Hence no de-commissioning of mining machinery is proposed.

4.17.5 Safety and security

Safety measures to be implemented to prevent access to excavations area by un-authorized persons as per Mines Act 1952, M.M.R. 1961.

- Safety measures will be implemented as per Mines Act 1952, MMR 1961, Mines Rules 1955.
- Provision of MMR 1961 shall be followed strictly and all roads shall be 10 m wide and have a gradient of not more than 1 in 20.
- Width of bench will be kept around 10.0 m for ease of operations and provide sufficient room for the movement of equipments.
- Protective equipment like dust masks, ear plugs / muffs and other equipments shall be provided for use by the work persons.
- Notice giving warning to prevent inadvertent entry of persons shall be displayed at all conspicuous places and in particular near mine entries.
- Danger signs shall be displayed near the excavations.
- Security guards will be posted.
- In the event of temporary closer, approaches will be fenced off and notice displayed.

4.17.6 Time Scheduling for Abandonment

324 m long road having width 5m and gradient 1:12 shall be made at 2156 mRL to 2183 mRL to open the mining faces from top to down ward. An area 0.128 area will be reclaimed during next five year 415m



long retaining wall having width and height 0.50m will be made at the edge of completed benches. The year wise schedule of completion of activities during next five year is given below:

S.No.	Activities	Yearwise					Total Amount (in Rs.)
		I st	II nd	III rd	IV th	V th	
1.	No. of sampling	625	425	425	425	425	2,350
2.	Reclamation Proposal	Nil	Nil	0.05	0.024	0.054	0.128
3.	Road (m)	324	Maintain	Maintain	Maintain	Maintain	324
4.	Retainng wall	Nil	Nil	140	80	195	415

4.17.7 Cost Estimation for protection and Rehabilitation:

The amount to be invested for the implementation of above proposal during next two year is given below:

S.No.	Activities	Yearwise					Total Amount (in Rs.)
		I st	II nd	III rd	IV th	V th	
1.	Plantation (Rs.40/ sampling)	25,000	17,000	17,000	17,000	17,000	93,000
2.	Reclamation (Rs. 20/sqm.)	Nil	Nil	10,000	4,800	10,800-	25,600
3.	Road (Rs 50/m.)	16,200	Nil	Nil	Nil	Nil	16,200
4.	Retainng wall (Rs.30/m.)	Nil	Nil	4,200	2,400	5,80	12,450
Total		41,200	18,080	31,200	24,200	33,650	1,47250

4.17.8 Financial Assurance

As per "CIRCULATION No. 19" dated 02.01.2004, amount spent towards reclamation and rehabilitation for considering reduction of the calculated financial assurance has been fixed for Rs.15000 per hectare for category B mines. In general the cost of rehabilitation in the tune of Rs. 1.00 Lakhs / hectare in Indian condition.

The tentative cost for implementing the protective and rehabilitation measures/proposal given in the progressive Mine closure Plan for the period (2013-2018) are as under:

S.No.	Activities	Yearwise					Total Amount (in Rs.)	Rate	Amount	
		I st	II nd	III rd	IV th	V th				
1.	Plantation (No's of sampling)	625	425	425	425	425	2,350	40/ sampling	94000	
2.	Reclamation (sqm.)	Nil	Nil	10,000	4,800	10,800	25,600	20/sqm.	25600	
3.	Road (m.)	324	Nil	Nil	Nil	Nil	16,200	50/m	16200	
4.	Retainng wall (m.)	Nil	Nil	4,200	2,400	5,80	12,450	30/m	12450	
Total		(One Lakhs eight thousand two hundred fifty) 1,48,250								



4.18 SUMMARY

The proposed mining operations are not anticipated to raise the concentration of the pollutants beyond prescribed limits. However, the measures are suggested to mitigate any harmful impacts of pollutants like plantation of trees along haul roads, specially near settlements, to help to reduce the impact of dust on the nearby villages; planning transportation routes of mined material so as to reach the nearest paved roads by shortest route; regular water sprinkling on unpaved roads to avoid dust generation during transportation etc. Some of impacts may be due to increase in the PCU/hr which is **15 PCU/hr**. Transportation of Mineral should be minimized in the morning and evening and cannot be done in night. Access roads will not encroach into the riparian zones. Fugitive emission from vehicle movement will form a layer in leaves thus reducing the gaseous exchange process. The impact on the present noise levels due to mining operations will be restricted to the work zone areas only. The impact on the ambient noise levels will not be felt at the settlement areas due to masking effect with the existing noise levels. There is no drilling and blasting envisaged in this mining project so there is no impact of vibration due to this project. Hence, the noise levels and vibration impact due to the proposed mining operations on community will be minimal. The soil removed from outside riverbed will be simultaneously utilized for reclamation purpose before shifting in to next hectare area/field. There will be no impact on water environment due to mining in outside riverbed since there is no intersection of water table due to mining activity. There will be no waste water generation from the proposed mining activity except sanitary waste water generation that will be treated in septic tanks and will be used for plantation purpose. The mine worker will generate municipal solid waste of about **10 Kg per day** which will have adverse impact on human health. There will be **2 Nos. of garbage** provided for domestic waste collection. There is no overburden generate due to mining activity I. The mining activities will be done in a systematic manner by maintaining the road infrastructure and vehicle transport which will be protective measure for preserving the topography and drainage in the area. The ownership will not be changed as the land has been taken on contract which will be returned as it is after the contract period is over. No human settlement should be permitted in the lease. The mining of Lime stone is likely to increase the per capita income of local people by which the socio-economic status of the people will be improved. The local people have been provided with either direct employments or indirect employment such as business, contract works and development work like roads, etc. and other welfare amenities such as medical facilities, conveyance, free education, drinking water supply etc. Except dust generation, there is no source which can show a probability for health related diseases. Regular water sprinkling will be done with sprinkle mounted tankers and dust masks will be provided to the workers. All workers will be subjected to medical examination as per Mines Rule 1955 both at time of appointment and at least once in a year. Medical camps will be organized for this activity. Insurance of all employees as per the rules will also be carried out. R&R issues are not involved with this project. This amount will be spent by lease holder for the protection of environment, mineral conservation in the surrounding area of core and buffer zone.



CHAPTER-5

ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)

5.0 INTRODUCTION

Consideration of alternatives to a project proposal is a requirement of EIA process. During the scoping process, alternatives to a proposal can be considered or refined, either directly or by reference to the key issues identified. A comparison of alternatives help to determine the best method of achieving the project objectives with minimum environmental impacts or indicates the most environmentally friendly and cost effective options.

5.1 ALTERNATIVE FOR MINE LEASE

The project is proposed for mining of Mineral Lime Stone Mine over an area of 21.106 Ha. with production capacity of **53055 TPA** in Village Chakdura (Bathyn and Khrew), Tehsil -Pampore , District- Pulwama (Jammu and Kashmir) By Mushtaq Muzafar Anim.

- It is an opencast mechanized mining project to excavate Mineral Lime Stone.
- The proposed project is mining of Mineral Lime Stone Mine. It is a site specific mining project; therefore no alternate site has been selected. From the nature and extent of the deposit, the reserve and the quality have been proved with adequate degree of reliability.

5.2 ALTERNATIVE FOR TECHNOLOGY AND OTHER PARAMETERS

Some alternatives considered during EIA study are discussed below:

Table 5.1: Alternative for Technology and other Parameters

S. No.	Particular	Alternative Option 1	Alternative Option 2	Remarks
1.	Technology	Opencast semi mechanized and mechanized mining	Opencast mechanized mining Involving drilling and blasting	Opencast mechanized involving drilling and blasting is preferred. Benefits: <ul style="list-style-type: none"> • Material is hard so to make it loose and to bring it to appropriate size.
2.	Employment	Local employment	Outsource employment	Local employment is preferred. Benefits: <ul style="list-style-type: none"> • Provides employment to local people along with financial benefits • No residential building/ housing is required.
3.	Labourer transportation	Public transport	Private transport	Local labours will be deployed so they will either reach mine site by bicycle or by foot. Benefits: <ul style="list-style-type: none"> • Cost of transportation of men will be negligible.



S. No.	Particular	Alternative Option 1	Alternative Option 2	Remarks
4.	Material transportation	Public transport	Private transport	Material will be transported through trucks/trolleys on the contract basis Benefits: • It will give indirect employment.
5.	Water requirement	Tanker supplier	Ground water/surface water supply	Tanker supply will be preferred. Benefits: • No change in the surface water or ground water quality.
6.	Road	Haul road	Metallic road	Haul road will be considered for linking mine site from metallic road for transportation purpose Minimum distance will be measured along with less number of trees for considering optimum haul road roots. Benefits: • Less distance, less fuel used, minimum or negligible no. of trees will be cut in best opted haul road root.

5.3 SUMMARY

The proposed project is mining of Mineral Lime Stone Mine. It is a site specific mining project; therefore no alternate site has been selected.



CHAPTER: 6

ENVIRONMENTAL MONITORING PROGRAM

6.0 INTRODUCTION

Regular monitoring of the various environmental parameters is necessary to evaluate the effectiveness of the management programme so that the necessary corrective measures can be taken in case there are some drawbacks in the proposed programme. Since environmental quality parameters at work zone and surrounding area are important for maintaining sound operating practices of the project in conformity with environmental regulations, the post project monitoring work forms part of Environmental Monitoring Program. Environmental Monitoring Program will be implemented once the project activity commences. Environmental Monitoring Program includes ascertaining the following:

- To assess environmental impacts.
- State of pollution within the mine lease and in its vicinity.
- Planning for predictive or corrective actions in respect of pollution to keep it within permissible limits.
- Examine the efficiency of pollution control system adopted at the site.
- Monitoring will be carried out at site as per the statutory requirements.
- Environmental monitoring will be taken up for various environmental components as per conditions stipulated in Environmental Clearance Letter issued by MoEF &CC & Consent to operate issued by the State Pollution Control Board. Compliance of same will be submitted to respective authorities on regular basis.

6.1 ENVIRONMENTAL MANAGEMENT CELL

In order to maintain the environmental quality within the stipulated standards, regular monitoring of various environmental components is necessary which will comply as per conditions. For this the lessee **Mushtaq Muzafar Anim** has taken decision to formulate an Environment Policy of the mine and constitute an Environmental Management Cell and committed to operate the proposed mine with the objectives mentioned in approved Environment Policy (Copy of approved Environmental Policy attached as **Annexure XII**). The system of reporting of NC/violation of any environmental law/ policy will be as per quality management system. The internal audit will be conducted on periodic basis and any non-conformities violation to environmental law will be closed and discussed during management review meeting if board of directors /partners.

Hierarchy

An EHS Manager will be appointed to look after all environmental issues and ensure compliance with Environmental Clearance conditions/SPCB norms. An Assistant Manager and Executive Environment Engineer will be appointed under the EHS Manager. EHS Manager will report to the Lessee directly and discuss the non-compliance if so any. An immediate solution will be arrived to ensure compliance with norms.

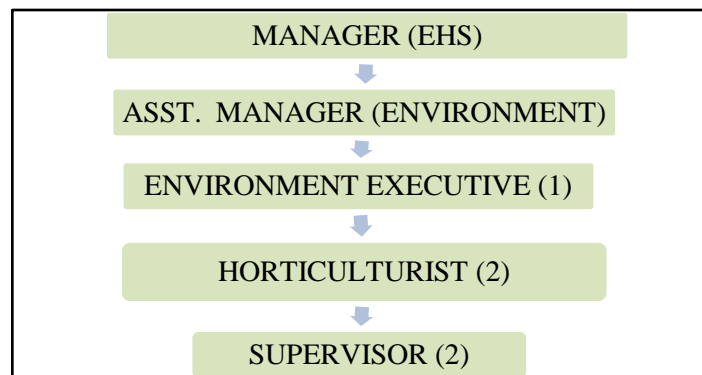


Figure 6.1: Hierarchy of Environment System for Dealing Environmental Issues



6.1.1 Responsibilities for Environmental Management Cell (EMC)

The responsibilities of the EMC include the following:

- i. Collecting water and air samples, work zone monitoring for air pollutants under guidance and in requirement of an accredited consultant.
- ii. Implementing the control and protective measures.
- iii. Coordinating the environment related activities within the project as well as with outside agencies.
- iv. Green belt development etc.
- v. Monitoring and evaluating the progress of implementation of environmental management programme.
- vi. Conducting Internal Audits
- vii. Closing of NCs and conducting MRM

6.2 ENVIRONMENTAL MONITORING AND REPORTING PROCEDURE

Monitoring shall confirm that commitments are being met. This may take the form of direct measurement and recording of quantitative information, such as amounts and concentrations of discharges and wastes, for measurement against corporate or statutory standards, consent limits or targets. It may also require measurement of ambient environmental quality in the vicinity of a sit using ecological/biological, physical and chemical indicators. Monitoring may include socio-economic interaction, through local liaison activities or even assessment of complaints.

The key aims of environmental monitoring are:

- To ensure that results/ conditions are as forecast during the planning stage, and where they are not, to pinpoint the cause and implement action to remedy the situation.
- To verify the evaluations made during the planning process, in particular with risk and impact assessments and standards and target setting and to measure operational and process efficiency.
- Monitoring will also be required to meet compliance with statutory and corporate requirements.
- Finally, monitoring results provide the basis for auditing, *i.e.* to identify unexpected changes.

6.3 MONITORING METHODOLOGIES AND PARAMETERS

Table 6.1: Monitoring Methodologies and Parameters

Attributes	Sampling		Measurement Method	Test Procedure
	Network	Frequency		
A. Air Environment				
Meteorology Wind speed Wind direction Dry bulb temperature Wet bulb temperature Relative humidity Rainfall	Minimum 1 site in the project impact area	Twice in a week	Mechanical/ automatic weather station	-
Pollutants PM ₁₀	6 locations in the project impact area (Minimum 2 locations in upwind side, more sites in downwind side /impact zone)	Revised National Ambient Air Quality Standards (NAAQS) vide MoEF&CC circular, dated 16.11.2009	Gravimetric method	-
SO ₂			EPA Modified West and Geake method	Absorption in Potassium Tetra Chloromercurate followed by Colorimetric estimation using P-Rosaniline



				hydrochloride and Formaldehyde (IS: 5182 Part - II).
NO ₂			Arsenite modified Jacob and Hochheiser	Absorption in dill NaOH and then estimated colorimetrically with sulphaniamide 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, Iron, Copper, Manganese, Mercury, Cadmium, Selenium, Arsenic, Cyanide, Lead, Zinc, Chromium, Aluminum, Boron, Phenolic compounds	Set of grab samples during pre and post-monsoon for 4 ground water samples and 2 surface water samples for 10 km distance area.	Twice in a week	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 Standard methods for examination of water and wastewater analysis published by American Public Health Association.
C. Noise				
Noise levels at Day and night time -Leq dB (A)	Mine Boundary, High noise generating areas within the lease	Quarterly	As per CPCB norms	As per CPCB norms
D. Soil				
pH, Bulk Density, Soil texture, Nitrogen, Available Phosphorus, Potassium, Calcium, Magnesium, Sodium, Electrical Conductivity, Organic Matter, Chloride	3 locations in the project impact area	Quarterly	As per CSSRI, IISWC Method	As per CSSRI, IISWC Method
E. Socioeconomic Status	Network	Frequency	Measurement Method	Test Procedure



<ul style="list-style-type: none"> • Demographic structure • Infrastructure resource base • Economic resource base • Health status: Morbidity pattern • Cultural and aesthetic attributes • Education 	Socio-economic survey is based on proportionate, stratified and random sampling method	Yearly	Primary data collection through questionnaire	Secondary data from census records, statistical hard books, toposheets, health records and relevant official records available with Govt. agencies
Ecological Impact				
<ul style="list-style-type: none"> • Green Belt Development • Conservation of Wild Life 	Survey	Yearly	Primary data collection.	Secondary data from statistical hard books, toposheets and relevant official records available with Govt. agencies

6.4 MONITORING SCHEDULE

Regular Monitoring of all the environmental parameters viz, air, water, noise and soil as per the formulated program based on CPCB and MoEF&CC guidelines will be carried out every year in order to detect any changes from the baseline status.

Table 6.2: Monitoring Schedule

S. No.	Description	Schedule Of Monitoring
1.	Air Quality	Twice in a week
2.	Water Quality (Surface and Ground Water)	Twice in a week
3.	Noise Level	Quarterly
4.	Ecology and Biodiversity	Yearly
5.	Soil Quality	Yearly
6.	Socio-economic Condition	Yearly
7.	Plantation Monitoring	Yearly

6.5 LOCATIONS OF MONITORING STATIONS

The location of the monitoring stations was selected on the basis of prevailing micro meteorological conditions of the area like; wind direction and wind speed, relative humidity, temperature. Locations for the post project monitoring shall be as under-

Table 6.3: Locations of Monitoring Stations

S. No.	Description	Location	Parameters
1	Ambient Air Quality	Lease area, Villages in Downwind direction from the Lease Boundary	PM _{2.5} , PM ₁₀ , SO _x , NO _x
2	Noise Level Monitoring	Lease Boundary, High noise generating areas within the lease boundary	Level in dB(A) and dB(C)



3	Water Level and Quality	Nearby Surface and Ground water sources	pH, SS, TDS, Iron, Hardness, Alkalinity
4	Soil Quality	Lease area and Villages within study area.	pH, Conductivity, Sulphate, Nitrate, Phosphates, Potassium, OM, and Texture.

Reporting Schedule during Operation of Mine

After completion of analysis, copies of all the analysis reports will be sent to MoEF&CC Regional Office and SPCB. Copies of the reports will be maintained in the office and will be made available to the concerned inspecting authorities.

6.6 BUDGET ALLOCATION FOR MONITORING

The cost of the project is **Rs. 8.00 Crores** and a budget for monitoring of Air, water, Noise and Soil will be **Rs. 4 Lakh** to be incurred by the project proponent for undertaking pollution prevention measures during the mining activity. In order to maintain the environmental quality within the stipulated standards, regular monitoring of various environmental components is necessary which will comply as per conditions. For this the lessee **Mushtaq Muzafar Anim** has taken decision to formulate an Environment Policy of the mine and constitute an Environmental Management Cell and committed to operate the proposed mine with the objectives mentioned in approved Environment Policy. EMP may also require measurement of ambient environmental quality in the vicinity of a site using ecological/biological, physical and chemical indicators. Monitoring may include socio-economic interaction, through local liaison activities or even assessment of complaints. Regular Monitoring of all the environmental parameters *viz.*, air, water, noise and soil as per the formulated program based on CPCB and MoEF&CC guidelines will be carried out every year. The location of the monitoring stations was selected on the basis of prevailing micro meteorological conditions of the area like; wind direction and wind speed, relative humidity, temperature.



CHAPTER: 7

ADDITIONAL STUDIES

7.0 GENERAL

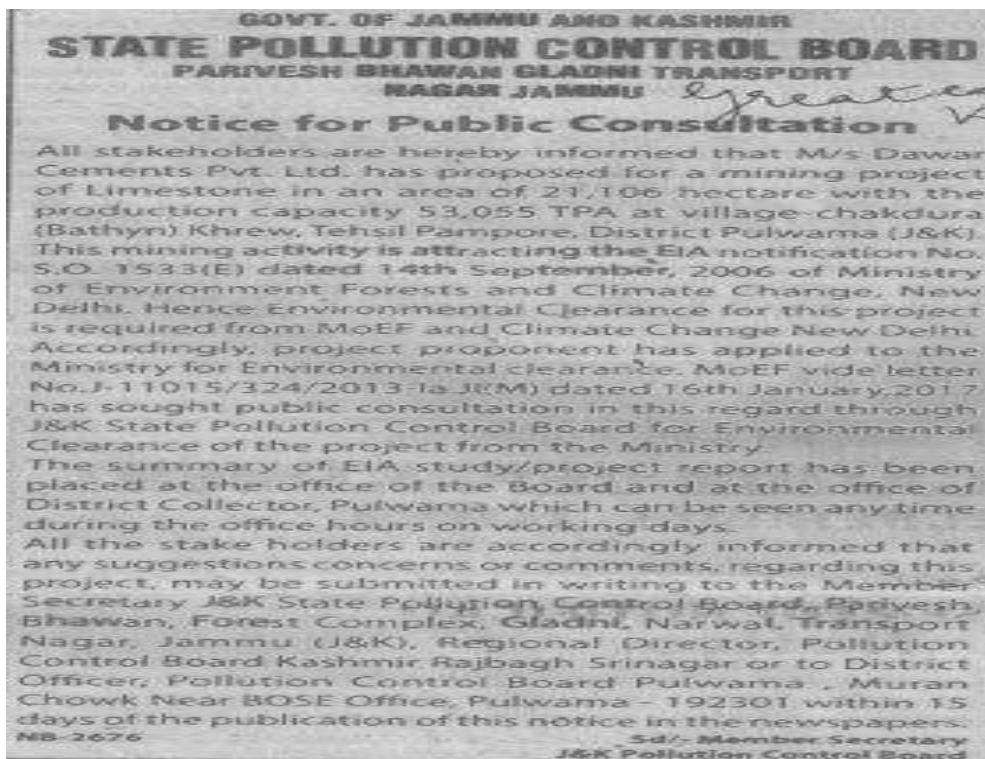
Mining operations are associated with several potential hazards that affect adversely the human health and environment. It would normally require the assistance of emergency services to handle it effectively. The mining operation will be taken up under the supervision and control of qualified staff including Mine Manager (Grade I). Similarly Stone mines also have impending dangers and risk which need to be addressed for which a disaster management plan has been prepared with an aim of taking precautionary steps to avert disasters and also to take such action after the disaster which limits the damage to the minimum.

Nevertheless, the following natural/industrial problems may be encountered during the mining operation.

- a. Inundation due to excessive rains.
- b. Accidents by heavy machinery.
- c. Slope failures at the mine faces etc.

7.1 . PUBLIC CONSULTATION ADVERTISEMENT

In view of direction of MoEF&CC Gol, the Member Secretary Jammu and Kashmir Pollution Control Board vide News Paper Greater Kashmir dated 04-02-2017 and Kashmir Reader dated 01-02 2017 and Subah Kashmir dated 01-02-2017 invited the general public to raise objection/suggestion regarding environment clearance of this mining project within 15 days from the date of consultation and the newspaper cutting is given below.



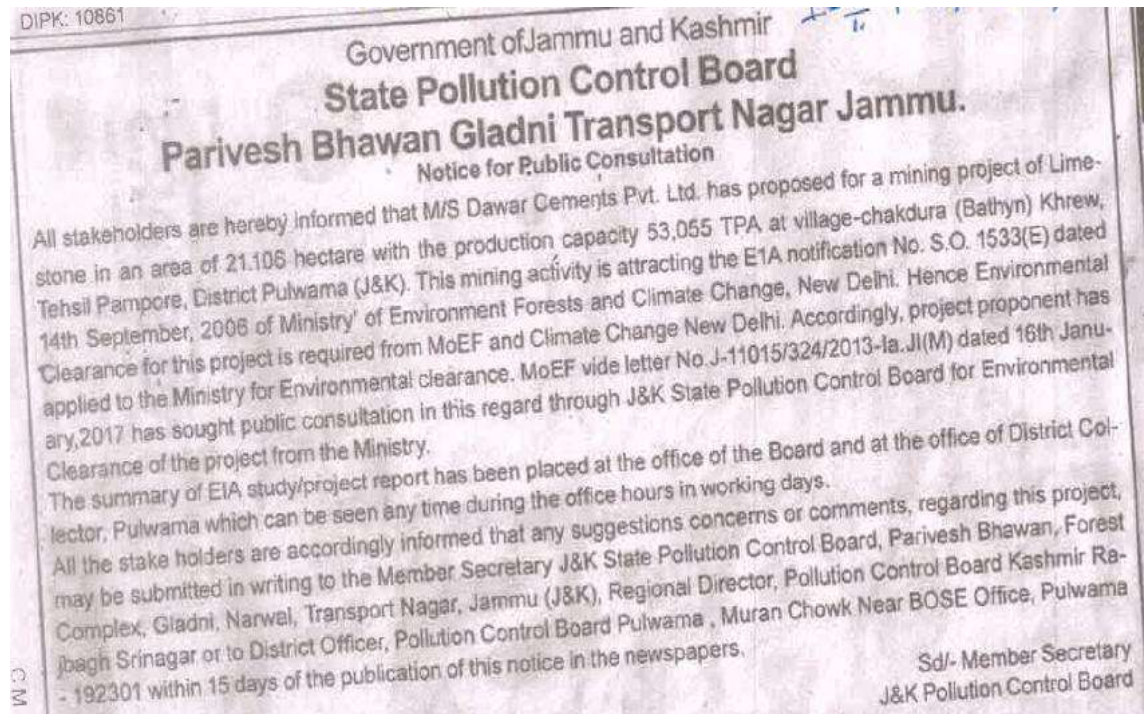


Figure 7.1 Advertisement regarding Public Consultation

7.2 PUBLIC CONSULTATION

Public hearing has its own significant in the Environment impact assessment process. As per EIA Notification 2006, the draft EIA report is submitted to State Pollution Control Board for conducting the public consultation for the proposed project. During this stage the opinion of the public residing near by



the project area is addressed and their concerns and suggestions are recorded. Based on that Final EIA report is prepared, which is submitted to Ministry of Environment & Forest for its appraisal.

Following the EIA process laid down by the EIA notification 2006 & its amendments the draft EIA report was prepared in July-16 after collection of baseline data in pre-monsoon period from March- May 2016. The proponent submitted the draft EIA report in State pollution control Board, J&K for its public hearing but due to hostile law and order situation in Kashmir valley including district Pulwama, Pollution Control Board Jammu and Kashmir was unable to conduct the public hearing.

Considering the current scenario, project proponent approached MoEF&CC, New Delhi to exempt the public hearing for the proposed project and submitted a request vide its letter dt. 19.9.2016 (Annexure-XIII). In response, Ministry of Environment, Forest & Climate Change vide its letter no. F. No. J-11015/324/2013-IA-II (M) (Pt) dt. 3d November 2016 (Annexure- Annexure-XIV) requested Chairman, Pollution Control Board, J&K to conduct the public hearing through the D.C. Pulwama with a copy to D.C. Pulwama district for necessary action. Considering the current Law & Order scenario of the district, D.C. Pulwama by his letter no. DCP/PA/16/1330-31 dt. 28.11.2016 (Attachment- Annexure- XV) informed MoEF&CC, New Delhi that conducting Public hearing is not feasible in current scenario.

In this regard, as per point no. V of the EIA Notification 2006, para 7, sub para 7 (i), Stage 3 Public consultation, If the public agency or nominated authority like SPCB reports to the regulatory authority concerned that owing to the local situation, it is not possible to conduct the public hearing in a manner which will enable the views of the concerned local persons to be freely expressed, it shall report the facts in detail to the concerned regulatory authority, which may, after due consideration of the report and other reliable information that it may have, decide that the public consultation in the case need not include the public hearing.

In view of letter of MoEF&CC GOI letter dated 3.11.2016 the public hearing was not conducted due to worst situation of law and order as reported by district collector in Pulwama Dated 28.11.16. However the MoEF&CC GOI directed the J&K State Pollution Control Board to conduct the public consultation. Accordingly J&K State Pollution Control Board made public notice via 3 News Paper Greater Kashmir dated 04-02-2017 and Kashmir Reader dated 01-02 2017 and Subah Kashmir dated 01-02-2017 to raise any objection/suggestion regarding environmental clearance of the mining project in the office of Member Secretary J&K State Pollution Control Board. During public consultation many objections and suggestions were received and the summary of the public consultation was submitted to Director (Mining) MoEF&CC GOI vide letter no 105 dated 25.04.17 by Member Secretary J&K State Pollution Control Board, copy enclosed as annexure XVI.

Para wise reply of objections/suggestions with action plan and budget provisions are given in tabular form as under:



Public Consultation/Objection raised by stakeholders in respect of environmental clearance proposal of mining project of lime stone at village-Chakdura (Bathyn and Khrew), Tehsil-Pampore, District-Pulwama (Jammu and Kashmir) By M/s Dawar Cement Pvt. Ltd.

Summary of issues raised by Stakeholders against the project

S.No	Name and Address	Objections	Reply	Action Plan / Budget																		
1.	AUQUAF	<p>1. Most of the cement plants including Dawar Cements failed to install pollution control devices.</p> <p>2. Saffron land has been adversely effected by cement plants.</p>	<p>Pollution control devices are installed to control the emission generated by the operation of cement plant. Consent to establish and consent to operate is granted by Jammu & Kashmir State Pollution Control Board to M/s Dawar Cement Plant.</p> <p>There is no adverse impact on the adjoining land of the cement plant. All the mitigation measures are taken to control the pollution.</p>	<p>Pollution control devices are installed to control the emission generated by the operation of cement plant .Regular environmental monitoring will be conducted and its compliance report submitted to the concern government departments.</p> <p>Budget A budget of Rs 32 Lakhs / annum given under the EMP out of which 4.00 Lakhs/annum will be utilized for the environment monitoring. The detail of EMP is given below</p> <table border="1"> <thead> <tr> <th>Particulars</th> <th>Capital (Lakh)</th> <th>Cost</th> </tr> </thead> <tbody> <tr> <td>Environment monitoring – Air, Water, Noise and Soil</td> <td>4.00</td> <td></td> </tr> <tr> <td>Dust Suppression</td> <td>8.00</td> <td></td> </tr> <tr> <td>Plantation including maintenance</td> <td>10.00</td> <td></td> </tr> <tr> <td>Haul road and other roads repair and maintenance</td> <td>10.00</td> <td></td> </tr> <tr> <td>Total</td> <td>32.00</td> <td></td> </tr> </tbody> </table> <p>The proposed annual production is 53055 TPA and daily production is 177 TPD it is evident that the per day production is very less hence the impact on the air pollution and traffic density will be negligible and these may be controlled by the proper environment management plan.</p>	Particulars	Capital (Lakh)	Cost	Environment monitoring – Air, Water, Noise and Soil	4.00		Dust Suppression	8.00		Plantation including maintenance	10.00		Haul road and other roads repair and maintenance	10.00		Total	32.00	
Particulars	Capital (Lakh)	Cost																				
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Plantation including maintenance	10.00																					
Haul road and other roads repair and maintenance	10.00																					
Total	32.00																					



			<p>The proposed annual production is 53055 TPA and daily production is 177 TPD it is evident that the per day production is very less hence the impact on the air pollution and traffic density will be negligible and these may be controlled by the proper environment management plan as given in EIA/EMP report.</p> <p>All the provision have been made in the EIA report and EMP to control the emission level of air pollution.</p> <p>To reduce the air pollution following mitigation measures will be adopted:-</p> <p>14.50 KLD water will be proposed for sprinkling on unpaved roads to avoid dust generation during transportation.</p> <p>Dust mask will be provided to the workers engaged at dust generation points like excavation and loading points.</p> <p>It is proposed to plant 1000 No. of local species per year with consultation of Forest Department with some fruit bearing and medicinal trees, along the haul roads, outer periphery within the lease area</p>	<p>To reduced the air pollution water sprinkling will be done and 14.50 KLD water will be proposed for sprinkling on unpaved roads to avoid dust generation during transportation and 1000 No. of local species per year will be planted with consultation of Forest Department with some fruit bearing and medicinal trees, along the haul roads, outer periphery within the lease area to prevent the impact of air pollution in the nearby village.</p> <p>To reduce the impact of air pollution on workers engaged, dust mask will be provide at the dust generation point.</p> <p>Budget</p> <p>A budget of Rs 20.00 lakhs is Proposed under OH&S.</p> <p>In addition of above a budget of RS 32 Lakhs is also proposed under the EMP which includes Pollution monitoring – Air, Water, Noise and Soil, Dust Suppression, Plantation including maintenance, Haul road and other roads repair and maintenance.</p>
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			<p>to prevent the impact of dust in the nearby village. The dust generation due to drilling will be minimized by wet drilling and dust due to blasting will minimized by water sprinkling. The speed of trucks plying on the haul road will be limited to avoid generation of dust and covering of material during transportation on trucks to prevent leakage of mineral from the trucks. The trucks will be covered by tarpaulin. Overloading will be avoided.</p> <p>A budget of RS 32 Lakhs is given under the EMP which include Pollution monitoring – Air, Water, Noise and Soil, Dust Suppression, Plantation including maintenance, Haul road and other roads repair and maintenance.</p> <p>The allegations of the applicant are false malafide and there are few antisocial elements they do not want to support the industrial production, industrial growth of the Jammu and Kashmir State due to their vested interest.</p>	
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2	Mr. N.A. Malik Advocate	1. Apprehension of damage to habitants and live stock due to blasting	<p>The mining is laying closed since June 2013. Blasting will be done after getting environment clearance with scientific controlling measures to reduce the impact on environment, and nearby habitants, livestock and land areas. Following controlling measures will be adopted to reduce the blasting impact:</p> <p>The blasting will be carried out during favorable atmospheric condition and less human activity timings.</p> <p>The latest equipment with sound-control devices will be used for blasting and mining activity and loading/unloading, etc and proper quantity of explosive, suitable stemming materials and appropriate delay system will be adopted to avoid overcharging and for safe blasting;</p> <p>Use of exhaust silencers and optimized acoustical pipe lagging</p>	<p>There will be no damage to habitants and live stock due to blasting because we will adobe all the mitigation measure to reduced the impact of blasting on the nearby area and all the mitigation measure also incorporated in the EIA/EMP report.</p> <p>Budget A budget of Rs 32 Lakhs / annum given under the EMP out of which 4.00 Lakhs/annum will be utilized for the pollution monitoring and 10 Lakhs for the plantation and Rs 16 lakhs/annum is given under the CSR which include Health Facility, Education Facility, Infrastructural Development, Community Water Conservation, etc. and Rs 15 lakhs is kept for the conservation of Biodiversity.</p>



		<p>2. Lease has not been properly granted and no Environmental Clearance has been obtained.</p>	<p>(acoustical wrapping) to minimize compressor noise. Minimum quantity of detonating fuse will be consumed by using alternatively excel non-electrical initiation system; Proper maintenance, oiling and greasing of machines at regular intervals shall be done to reduce generation of noise; The prime movers/diesel engines are properly maintained; 1000 no of local species of plants will be planted per year around the mining activity area and along haul roads. The plantation minimizes propagation of noise and air pollution.</p> <p>Mining lease of limestone over an area 21.106 Ha. at Village-Chakdura, (Bathyn and Khrew), Tehsil -Pampore, District-Pulwama was granted by Govt. of Jammu and Kashmir, Civil Sect. Industries and Commerce Department in favor of Sh. Mushtaq Muzaffar Anim S/o Haji Mohd. Muzafar Anim (one of director of M/s Dawar Cement) for a period of 20 Years w.e.f 26 March 2009-25.03.2029. Hence he has valid, legal, lawful, mining</p>	<p>Sh. Mushtaq Muzaffar Anim have valid, legal, lawful, mining lease and mining rights for mining of limestone at the project site because Mining lease of limestone over an area 21.106 Ha. at Village-Chakdura, (Bathyn and Khrew), Tehsil -Pampore, District-Pulwama was granted by Govt. of Jammu and Kashmir, Civil Sect. Industries and Commerce Department in favor of Sh. Mushtaq Muzaffar Anim S/o Haji Mohd. Muzafar Anim (one of director of M/s Dawar Cement) for a period of 20 Years w.e.f 26 March 2009-25.03.2029. Mining will be done after grant of EC from MoEF&CC GoI and proceed for grand of EC id under consideration in office of MoEF&CC GOI.</p>
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			<p>lease and mining rights for mining of limestone at the project site. The project proponent has applied for environmental clearance application in MoEF&CC and the case was appraised in 12th meeting of EAC committee MoEF&CC during 31Oct –1 Nov 2013.</p> <p>Earlier due to lack of knowledge we had not applied the environmental clearance of the mining project and also operated the mine without EC. Hence this was a violation case and all the action of violation has been completed in the year 2015.</p> <p>The mining was carried out without getting EC since 2008-2013 and the mining is laying closed since June 2013. As per direction of MoEF&CC letter dated 1/04/14 Jammu and Kashmir Pollution Control Board filed a court case in 2015 before the Hon’ble Court of Chief Judicial Magistrate Srinagar under section 15 of E (P) Act, 1986. The project proponent has submitted the board resolution vide letter dated 18.04.14 mentioning that no violation of</p>	
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		<p>3. TOR approved in 2014 and going for public consultation so belately is questionable.</p>	<p>EP act repeated in future. After prosecution the MoEF&CC granted the ToR for preparation of EIA report vide letter dated 22.01.2016 for production capacity of 50000 TPA (ROM).Further the production capacity was revised as 53055 TPA(ROM) by MoEF&CC letter dated 16.01.2017 based on approved mining plan production detail.</p> <p>For the grant of TOR detail reply is submitted in above para no-2 Reasons for late Public Consultation is that: It is matter of record that since last more than one year the law and order situated in district Pulwama is worst which is highlighted every day in the T.V channels, media, newspapers. On the basis of this bad law and order situation District Collector Pulwama vide his letter no 1330-31 dated 28.11.2016 requested to Director Ministry of Forest and Environment Gol and Member Secretary Jammu and Kashmir Pollution Control Board that it is not possible to conduct the public hearing /Consultation</p>	<p>The Member Secretary Jammu and Kashmir Pollution Control Board vide News Paper Greater Kashmir dated 04-02-2017 and Kashmir Reader dated 01-02 2017 and Subah Kashmir dated 01-02-2017 invited the general public to raise objection/suggestion regarding environment clearance of this mining project within 15 days of the publication of notice. In this way proper legal and lawful course was taken and sufficient time had been given to the general public to raise their objection/Suggestion</p>
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		<p>4. Legal course has not been followed just to accommodate the owner at the cost of environment and human life.</p>	<p>of this mining project.</p> <p>However Member Secretary Jammu and Kashmir Pollution Control Board vide News Paper Greater Kashmir dated 04-02-2017 and Kashmir Reader dated 01-02 2017 and Subah Kashmir dated 01-02-2017 invited the general public to raise objection/suggestion regarding environment clearance of this mining project within 15 days of the publication of notice. In this way proper legal and lawful course was taken and sufficient time had been given to the general public raise their objection/Suggestion.</p> <p>In this regard detailed reply has already been submitted in para-1 to 3. All the legal and lawful course has been taken into consideration by the mining lease holder, State Pollution Control Board Jammu & Kashmir, District Collector Pulwama and MoEF&CC Gol New Delhi.</p> <p>In the proposed EIA/EMP all the environmental related issues for human life has been taken into consideration with detail</p>	<p>Pollution control devices are installed to control the emission generated by the operation of cement plant .Regular environmental monitoring will be conducted and its compliance report will be submitted to the concern government departments.</p> <p>To reduced the air pollution water sprinkling will be done and 14.50 KLD water will be proposed for sprinkling on unpaved roads to avoid dust generation during transportation and 1000 No. of local species per year with consultation of Forest Department with some fruit bearing and medicinal trees, along the haul roads, outer periphery within the lease area to prevent the impact of dust in the nearby village.</p> <p>Budget A budget of Rs 32 Lakhs / annum given under the EMP out of</p>
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			mitigation measures and budgetary provisions.	<p>which 4.00 Lakhs/annum will be utilized for the pollution monitoring.</p> <p>To reduce the impact on workers engaged in the dust generation point the dust mask will be provide and a budget of Rs 20.00 lakhs is given under OH&S.</p> <p>A budget of RS 32 Lakhs/Annum is given under the EMP which includes Pollution monitoring – Air, Water, Noise and Soil, Dust Suppression, Plantation including maintenance, Haul road and other roads repair and maintenance.</p>
3	Civil Society Khrew	1. Deforestation in the area has been carried out thereby posing threat to environment and wild life.	<p>The land of this mining lease site is free from forest. In this regard Principle chief conservator of forest J&K Govt issued NOC for the mining lease area and the cement plant vide letter no-57-61 dated 19-01-2005.</p> <p>However It is proposed to plant 1000 No. of local species per year with consultation of Forest Department with some fruit bearing and medicinal trees, along the haul roads, outer periphery within the lease area to prevent the impact of dust in the nearby village.</p> <p>For the conservation of schedule-1 fauna present in the study area (10km radius) from proposed project site, a detail conservation plan was submitted to Chief wildlife warden forest deptt J&K Govt on dated 14-12-2016 with adequate budget</p>	<p>The mining lease land is not a forest land which is clarify by the Principle chief conservator of forest J&K Govt. NOC issued vide letter no-57-61 dated 19-01-2005.</p> <p>A conservation plan also prepare by the ecology and biodiversity expert to reduced the impact on the biodiversity and same was submitted to Chief wildlife warden forest deptt. J&K Govt on dated 14-12-2016 with adequate budget provisions. Hence impact on wildlife angle has also been taken into consideration.</p> <p>1000 No. of local species per year with consultation of Forest Department with some fruit bearing and medicinal trees, along the haul roads, outer periphery within the lease area to prevent the impact of dust in the nearby village.</p> <p>Budget</p> <p>A budget of RS 32 Lakhs/Annum is given under the EMP which includes Pollution monitoring – Air, Water, Noise and Soil, Dust Suppression, Plantation including maintenance, Haul road and other roads repair and maintenance and a budget of the Rs.15 Lakhs is kept for the conservation of biodiversity.</p>



		2. Allowing mining is against forest guidelines 2009 of ministry of Environment and Forest Government of India.	provisions. Hence impact on wildlife angle has also been taken into consideration. As per EIA notification 14 th September 2006 we are eligible to get the Environmental Clearance of this mining project. All the legal and lawful rule and regulations are being taken by the lease holder and MoEF&CC Gol.	-
4	Zamindara n Association Khrew	1. Apprehension of damage to humans and live stock	In this regard detailed reply has been given in the observation raised by Mr. N.A. Malik Advocate.	In this regard detailed reply has been given in the above para.
5	AUQUAF Committee Halqa Nagandar	1. Environment friendly and developmental activities are welcome.	This observation is in support of this mining project as detailed provisions for safeguard of environmental issues are taken into consideration in the EIA/EMP report of this project.	This mining project will provide direct and indirect employment opportunities to the local villagers. About 39 technical, non-technical, skilled, unskilled, workers of the nearby villages as per their qualification will be employed by the lease holder. In addition to above many workshops, repair shops, spare parts shop, hotels, tea stalls, daily need shops will setup by local villagers. The lease holder will employ numbers of Bill Clerks, Account Persons, Security Guards and Gardeners. In this way about 150 persons will get employment in this mining project. Socio economic conditions of the village will be improved. Budget A budget of Rs 16 Lakhs/annum is proposed for CSR activity. It will be replied for the welfare for the local villagers i.e Health Facility, Education Facility, Sanitary Provision and Drinking Water Facility at Khrew Village, Infrastructural Development, Community Water Conservation, etc.



		<p>2. P.H. should be conducted, & exemption is not advisable as many issues will remain unaddressed.</p>	<p>It is matter of record that since last more than one year the law and order situated in district Pulwama is worst which is highlighted every day in the T.V channels, media, newspapers. On the basis of this bad law and order situation District Collector Pulwama vide his letter no 1330-31 dated 28.11.2016 requested to Director Ministry of Forest and Environment Gol and Member Secretary Jammu and Kashmir Pollution Control Board that it is not possible to conduct the public hearing /Consultation of this mining project. (Copy enclosed as Annexure-XIV) However Member Secretary Jammu and Kashmir Pollution Control Board vide News Paper Greater Kashmir dated 04-02-2017 and Kashmir Reader dated 01-02 2017 and Subah Kashmir dated 01-02-2017 invited the general public to raise objection/suggestion regarding environment clearance of this mining project within 15 days of</p>	<p>A budget of Rs 32 Lakhs / annum given under the EMP out of which 4.00 Lakhs/annum will be utilized for the pollution monitoring and Rs 15 lakhs is kept for the conservation of Biodiversity and 20 Lakhs/annum under OH&S.</p> <p>Keeping in view of the worst law and order situation in the Kashmir ghat including in district Pulwama legal and lawful administrative decision was taken by district administration Pulwama, J&K State Pollution Control Board and MoEF&CC Gol to do only public consultation and instead of public hearing. Legal and lawful course was taken to conduct public consultation .</p>
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			<p>the publication of notice. In this way proper legal and lawful course was taken and sufficient time had been given to the general public raise their objection/Suggestion.</p> <p>In this public consultation invited through news paper by J&K State Pollution Control Board, all the environmental issues are addressed.</p>	
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SUMMARY OF ISSUES RAISED BY STAKE HOLDER IN FAVOUR OF THE PROJECT			
Sr. no	Name and Add.	Suggestion/Observation	Action Plan/Budget
1	Javeed Ahmad R/o Pakharbal New Colony	Project will generate employment and will result in economic up-liftment of the area. Lease holder has committed to contribute as per CSR.	<p>This mining project will provide direct and indirect employment opportunities to the local villagers. About 39 technical, non-technical, skilled, unskilled, workers of the nearby villages as per their qualification will be employed by the lease holder. In addition to above many workshops, repair shops, spare parts shop, hotels, tea stalls, daily need shops will setup by local villagers. The lease holder will employ numbers of Bill Clerks, Account Persons, Security Guards and Gardeners. In this way about 150 persons will get employment in this mining project. Socio economic conditions of the village will be improved.</p> <p>Budget A budget of Rs 16 Lakhs/annum is proposed for CSR activity. It will be replied for the welfare for the local villagers <i>i.e</i> Health Facility, Education Facility, Sanitary Provision and Drinking Water Facility at Khrew Village, Infrastructural Development, Community Water Conservation, etc. A budget of Rs 32 lakhs/annum is given under EMP and detail of EMP is given in the para 1.</p>



2	Farooq Ahmad Shiekh and Ors. R/o Pakharbal New Colony	Project will generate employment and will result in economic up-liftment of the area. Lease holder has committed that he will contribute to the society of adjoining village in terms of health & education sectors.	The detail of economic up-liftment of the area is given in the above para
3	Bilal Akbar Sheikh S/o Mohd. Akber Sheikh Khrew	Project will generate employment and will result in economic up-liftment of the area	Detail has already been given in the above para.
4	Manzoor Ahmad Lone R/o Bathen	Project will generate employment and will result in economic up-liftment of the area. The Lease holder has been maintaining healthy relations with all the zamindars of vicinity.	Detail has already been given in the above para.
5	Mohd. Yousuf Lone R/o Bathen	Project will generate employment and will result in economic up-liftment of the area. Company has always remained eco-friendly and has contributed in terms of donation for the education of poor people of our village.	The employment detail is already described in the above para and after get the EC the mining will be done after adobe all the pollution mitigation measures.
6	Fayaz Ahmad Lone R/o Bathen	Project will generate employment and will result in economic up-liftment of the area. The Lease owners have taken initiative for macdaminzation of roads leading to mining site. The zamindars in & around will earn their livelihood because of this project.	This mining project will provide direct and indirect employment opportunities to the local villagers. About 39 technical, non-technical, skilled, unskilled, workers of the nearby villages as per their qualification will be employed by the lease holder. In addition to above many workshops, repair shops, spare parts shop, hotels, tea stalls, daily need shops will setup by local villagers. The lease holder will employ numbers of Bill Clerks, Account Persons, Security Guards and Gardeners. In this way about 150 persons will get employment in this mining project. Socio economic conditions of the village will be improved. Budget A budget of Rs 16 Lakhs/annum is proposed for CSR activity. It will be replied for the welfare for the local villagers <i>i.e</i> Health Facility, Education Facility, Sanitary Provision and Drinking Water Facility at



			<p>Khrew Village, Infrastructural Development, Community Water Conservation, etc.</p> <p>A budget of Rs 32 Lakhs / annum given under the EMP out of which Rs.10.00 Lakhs/annum will be utilized for the pollution monitoring. The detail of EMP is given below</p> <table border="1"> <thead> <tr> <th>Particulars</th> <th>Cost (Lakh)</th> </tr> </thead> <tbody> <tr> <td>Pollution monitoring – Air, Water, Noise and Soil</td> <td>4.00</td> </tr> <tr> <td>Dust Suppression</td> <td>8.00</td> </tr> <tr> <td>Plantation including maintenance</td> <td>10.00</td> </tr> <tr> <td>Haul road and other roads repair and maintenance</td> <td>10.00</td> </tr> <tr> <td>Total</td> <td>32.00</td> </tr> </tbody> </table>	Particulars	Cost (Lakh)	Pollution monitoring – Air, Water, Noise and Soil	4.00	Dust Suppression	8.00	Plantation including maintenance	10.00	Haul road and other roads repair and maintenance	10.00	Total	32.00
Particulars	Cost (Lakh)														
Pollution monitoring – Air, Water, Noise and Soil	4.00														
Dust Suppression	8.00														
Plantation including maintenance	10.00														
Haul road and other roads repair and maintenance	10.00														
Total	32.00														
7	Mohd. Yousuf Lone R/o Bathen	Project will generate employment and will result in economic up-liftment of the area.	Detail has already been given in the above para.												
8	Nazir Ahmad Mir R/o Bathen	Project will generate employment and will result in economic up-liftment of the area.	Detail has already been given in the above para.												
9	Mohd. Ayub Lone R/o Bathen	Project will generate employment and will result in economic up-liftment of the area.	Detail has already been given in the above para.												
10	Gir Rasool Shah R/o Bathen	Project will generate employment and will result in economic up-liftment of the area. The project will also help in social development as lease holders have taken initiative of tube well connection which will supply drinking water to adjoining villages & will also serve the purpose of irrigation to the fields of zamindars of area.	For the social welfare and upliftment a budget of Rs 16 lakhs/annum is provided in CSR activities. It is utilized for supply for drinking water, sanitation and irrigation in nearby villages.												
11	Mohd. Afzal Shah R/o Bathen	Project will generate employment and will result in economic up-liftment of the area	Detail has already been given in the above para.												
12	Nazir Ahmad Lone R/o Bathen	Project will generate employment and will result in economic up-liftment of the area	Detail has already been given in the above para.												
13	Manzoor Shahora	Project will generate employment and will	Detail has already been given in the above para.												



	R/o Bathen	result in economic up-liftment of the area	
14	Farooq Ahmad Lone R/o Bathen	Project will generate employment and will result in economic up-liftment of the area	Detail has already been given in the above para.
15	Mohd. Afzal Lone R/o Nagand	Project will generate employment and will result in economic up-liftment of the area	Detail has already been given in the above para.
16	Abdul Rashid Lone R/o Nagand Mohd. Iqbal Sheikh R/o Nagan, Hilal Ahmad Sheikh R/o Wagund	Project will generate employment and will result in economic up-liftment of the area	Detail has already been given in the above para.
17	Farooq Ahmad Bhat, R/o Kharpora	Project will generate employment and will result in economic up-liftment of the area	Detail has already been given in the above para.
18	Bilal Ahmad Bhat, R/o Zantrang	Project will generate employment and will result in economic up-liftment of the area	Detail has already been given in the above para.
19	Nisar Ahmad Ganai, R/o Zantrang	Project will generate employment and will result in economic up-liftment of the area	Detail has already been given in the above para.
20	Sajad Shafi Teli, R/o Kharpora	Project will generate employment and will result in economic up-liftment of the area	Detail has already been given in the above para.
21	Alif Din Kaka, R/o Bajandi	Project will generate employment and will result in economic up-liftment of the area	Detail has already been given in the above para.
22	Azad Contractors Association Khrew	Association has no objection, Project will prove beneficial for all	Detail has already been given in the above para.
23	Farooq Ahmad Shah R/o Nagandar	Project will generate employment and will result in economic up-liftment of the area	Detail has already been given in the above para.
24	Muneer Ashraf R/o Nagandar	Project will generate employment and will result in economic up-liftment of the area	Detail has already been given in the above para.
25	Bashir Ahmad R/o Nagandar	Project will generate employment and will result in economic up-liftment of the area	Detail has already been given in the above para.
26	Youth Welfare	Industry has good relations with locals, it	Detail has already been given in the above para.



	Committee Khrew Pampore Kashmir	provide jobs, company is help full and it shall benefit all	
27	TCI Max Cemnet Khrew	Issues addressed objections raised against the project are withdrawn and issues shall find redressal in Environmental Clearance conditions	As the conditions of environmental clearance will be fulfilled . Its six monthly compliance report will be submitted to the Concerned regulatory authority.
28	Youth Co-ordination Committee Halqa Bathen Khrew	Project will generate employment and will result in economic up-liftment of the area	Detail has already been given in the above para
29	Citizen Forum Khrew Pampore Kashmir	Project will result in socio economic development, Company has good public realtions	Detail has already been given in the above para
30	Farooz Ahmad Sheikh R/o Phakarbal New Colony Khrew	Project will generate employment and will result in economic up-liftment of the area. The lease stakeholders has committed in principle to take care of workers health & others benefits, So, there is No-Objection.	The detail reply regarding employment is given in above para. Dust mask will be provided to the workers engaged at dust generation points like excavation and loading points to reduce the health impact of workers. Budget A Budget of Rs 20 Lakhs/annum is given under the OH&S for the workers health & others benefits.
31	M/s Valley Woven Sacks, Khrew Pampore	Project will generate employment and will result in economic up-liftment of the area	Detail has already been given in the above para

7.3 HAZARD IDENTIFICATION AND RISK ASSESSMENT METHODOLOGY

All types of industries face certain types of hazards which can disrupt normal activities abruptly. Similar stone mining also have risks which need to be addressed for which a disaster management plan has been formulated with an aim of taking precautionary steps to avert disasters and also take such action after disaster which limits the damage to minimum. In the sections below, the identification of various hazards, probable risks during



the operational phase of the mining, maximum credible accident analysis and consequences analysis are addressed either qualitatively or quantitatively.

Risk assessments will help mine operators to identify high, medium and low risk levels. This is a requirement of the Occupational Health and Safety Act 2000. Risk assessments will help to priorities the risks and provide information on the need to safely control the risks. In this way, mine owners and operators will be able to implement safety improvements. The following natural/industrial problem may be encountered during the mining operation.

- Inundation: Filling of the mine pit due to excessive rains,
- Blasting- Fly rocks and Boulders,
- Drilling- Noise and Vibration,
- Handling of overburden and heavy machinery,
- Storage of diesel,
- Slope failures at the mine faces or stacks.

As per proposal made under the mining plan the area will be developed by means of opencast mining method. Extraction of minerals is to be carried out by mechanized mining means. Water table will not be touched during the mining process. No high risk accidents like landslides, subsidence flood etc have been apprehended.

7.3.1 Blasting

This is the reason of common accident into mines. Most of the accidents from blasting occur due to the projectiles and mainly due to overcharging of the shot holes as a result of certain special features of the local ground. Flying rocks are encountered during initial and final blasting operations. Noise and dust also generated during blasting.

7.3.2 Vibration

Whenever a blast is conducted the vibration is felt in the form of ground vibration. The ground motion is essentially a wave motion. The particles of the ground through which the blasting/sound wave travels, set themselves to oscillating motions with respect to their rest positions. These waves can affect buildings and structures by forming visible cracks on the surface, because of compression and tension waves and through vertical and horizontal shearing effects.

7.3.3 Risks due to Inundation

Mining will be done during the non-monsoon periods (March- May); therefore problem of inundation is not likely to happen.

7.3.4 Risks due to Failure of Pit Slope

In order to allay dangers due to open cast slope failure, final pit, slope stability estimations will be made for the existing mines. Determining the factor of safety, the slopes should be monitored at regular intervals to check for any possible failure.

7.3.5 Risk due to Handling of Overburden and Heavy Machinery

During the mining, most of the activities are done by the vehicles and the heavy machinery for mining and handing of the mineral. There is no overburden or waste will be generated during the first five year of mining operation. Heavy machinery also cause for accidents due to mechanical failure.

7.3.6 Risks of Accidents due to Trucks and Dumpers

Identifying the hazards that come along with the presence of vehicles at the workplace (*e.g.* reversing operations, loading) can cause harm if not properly handled. Among some of the factors that may make vehicle accidents more likely are:



- Rough access roads
- Time pressure
- Inadequate brakes (Possibly from lack of maintenance)
- Carelessly parked vehicles (e.g. being parked on a slope without being adequately secured)
- Unsafe coupling and uncoupling of trailers, and
- Untrained drivers
- Overturning vehicles

To avoid such instances we will talk to the workers and their representatives and will involve them in the risk assessment process and tell them what to do, to reduce risk. All transportation within the mine lease area should be carried out directly under the supervision and control of management.

- The vehicles will be maintained in good working condition and checked thoroughly at least once a month by the competent person authorized for the purpose by the management.
- Road signs will be provided at each and every turning point up to the main road (wherever required)
- To avoid danger while reversing the vehicles especially at working place/loading points, stopper should be posted to properly guide reversing/spotting operating.
- Only trained drivers will be hired.

7.3.7 Storage and use of Explosive Materials

- Proper and safe storage of explosives in approved and Licensed Magazine.
- Proper, safe and careful handling and use of explosives by competent Blasters having Blaster's Certificate of Competency issued by DGMS.
- Proper security system to prevent theft/ pilferage, unauthorized entry into Magazine area and checking authorized persons to prevent carrying of match box, lights, mobile phones, cigarette or Biri etc.
- Conventional explosives shall be used in their original cartridge packing and such cartridge shall not be cut to remove explosive for making cartridge of different size.
- Explosives shall be conveyed in special containers.
- Before starting charging, clear audible warning signals by Sirens will be given so that people nearby can take shelter.

The results of risk assessment are given in table below:

Table 7.1: Hazards faced in stone mining operations

S. No.	Activity	Hazard Description (Risk)	Score				Risk Level
			Consequences	Exposure	Probability	Risk Score	
1.	Site planning and layout	Travel in moving vehicle in uneven terrain	1	2	1	2	Level 3
2.	Storage of explosives	Unintended explosions (exposure to overpressure)	1	5	3	15	Level 1
3.	Charging of explosives	Unintended explosion or exposure (exposure to overpressure)	1	3	1	3	Level 3
4.	Blasting	Hit by fly rock (bodily injuries)	1	2	1	2	Level 3



S. No.	Activity	Hazard Description (Risk)	Score				Risk Level
			Consequences	Exposure	Probability	Risk Score	
5.	Bench Formation	Rock falls or slide due to lack of bench face stability (bodily injuries)	5	1.5	2	15	Level 1
6.	Crushing and sizing of ROM	Hit by Machineries – Electrical Equipment (bodily injuries)	1	3	3	9	Level 2
7.	Transportation of minerals	Vehicle Accident (bodily injuries)	5	5	2	50	Level 1
8.	Transportation of minerals	Accidental fire in vehicle (bodily injuries, exposure to heat radiation)	1	5	1	5	Level 3

By arranging the above hazards from highest to lowest, the hazards were re-arranged as per their risk levels. Ranking of hazards based on risk levels are provided below in the Table.

Table 7.2: Hazards ranked by Risk level

S.No.	Activity	Hazard Description (Risk)	Risk Score	Risk Level
1.	Site planning and layout	Travel in moving vehicle in uneven terrain	2	Level 3
2.	Storage of explosives	Unintended explosions (exposure to overpressure)	15	Level 1
3.	Charging of explosives	Unintended explosion or Exposure (exposure to overpressure)	3	Level 3
4.	Blasting	Hit by fly rock (bodily injuries)	2	Level 3
5.	Bench Formation	Rock falls or slide due to lack of bench face stability (bodily injuries)	15	Level 1
6.	Crushing and sizing of ROM	Hit by Machineries – Electrical Equipment (bodily injuries)	9	Level 2
7.	Transportation of minerals	Vehicle Accident (bodily injuries)	50	Level 1
8.	Transportation of minerals	Accidental fire in vehicle (bodily injuries, exposure to heat radiation)	5	Level 3

7.3.8 Hazard Analysis

Broadly, the hazards cover explosive material management, working at heights, slope and bench stability, mineral transport, mineral processing and force majeure conditions (rainfall and flooding). The mechanisms due to which hazards (coming under Risk Levels 1 and 2) may actually occur are covered in Table 7.3.

Table 7.3: Cause analysis for Level 1 and Level 2 hazards

S. No.	Hazard Description (Risk)	Risk Score	Risk Level	Cause Analysis
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1	Travel in moving vehicle in uneven terrain	2	Level 3	<ul style="list-style-type: none"> • Poor visibility • Incompetent driver • Poorly maintained vehicles
2	Unintended explosions (exposure to overpressure)	15	Level 1	<ul style="list-style-type: none"> • Defective explosives • Outdated explosives • Improper storage of explosives • Force majeure conditions such as lightning strike • Fire (can be caused by unsafe practices or as ignition)
3	Unintended explosion or exposure (exposure to overpressure)	3	Level 3	<ul style="list-style-type: none"> • Defective explosives • Outdated explosives • Improper storage of explosives • Force majeure conditions such as lightning strike • Fire (can be caused by unsafe practices or as arson)
4	Hit by fly rock (bodily injuries)	2	Level 3	<ul style="list-style-type: none"> • Poor access control of blast area • Poor blasting practices (leading to excessive fly rock)
5	Rock falls or slide due to lack of bench face stability (bodily injuries)	15	Level 1	<ul style="list-style-type: none"> • Improper design of bench • Force Majeure (such as heavy floods or rainfall) • Improper blasting practices • Incompetent blasting personnel
6	Hit by Machineries – Electrical Equipment (bodily injuries)	9	Level 2	<ul style="list-style-type: none"> • Improper design of equipment • Improper maintenance • Non usage of required PPE • Incompetent Personnel
7	Vehicle Accident (bodily injuries)	50	Level 1	<ul style="list-style-type: none"> • Head on collision between vehicle and another vehicle (due to poor visibility or incompetent drivers) • Poor vehicle maintenance
8	Accidental fire in vehicle (bodily injuries, exposure to heat radiation)	5	Level 3	<ul style="list-style-type: none"> • Accident to vehicle carrying fuel, and subsequent ignition of spilt fuel • Improper storage of fuel, in MS drums, leading to spillage followed by ignition • Driving with loaded material on uneven terrain, and subsequent ignition of spilt fuel

7.3.9 Controls and Action Plans

To ensure that causes leading to the possible consequences are prevented from occurring, control and action plans are developed and suggested as described in Table 7.4. It is required that these control and action plans be implemented and reviewed at least annually and also when there are changes to the work plan.



Table 7.4: Control and Action Plan

S. No	Hazard	Causes	Control	Relevant Legislation	Procedure	Existing Procedure (Y/N)	Responsible Person (Designation)
1	Unintended explosions (exposure to	Defective explosives	Explosive used should be purchased only from approved and licensed authority	Metalliferous Mines Regulation – 1961.	If any defective explosive is found, it is returned back to the original	Y	Authorized supplier of explosives
	overpressure) during storage of explosives in magazines		If deteriorated or unserviceable explosive is found, seek advice of licensing authority	Explosive act, 1884	supplier for disposal at their end as per Rule 16 of The Explosive Rules 1983		
		Outdated explosives	Records and accounts of explosive stock and issue is to be maintained Stock should be drawn upon strict rotation Well planning for requirement of explosives shall be exercised Disposal of outdated explosives as the chief controller or controller of explosive may issue	Explosive act, 1884, MMR – 1961.	Maintaining registers for Explosives receipt, issue and stock as per Reg. 154, 156 of MMR 1961.	Y	Mines Manager
		Improper storage of explosives	Detonator are to be stored separately Explosives shall	Explosive act, 1884,	Explosives and Detonators are stored separately as	Y	Mines Manager



		be stored in dry and well ventilated area		per approved design and licensed capacity of magazine under Explosive act, 1884		
	Force majeure conditions such as lightning strike	Lightning conductor are to be installed on the top of magazine Lightning conductor should not have resistance more than 10 ohms	The Explosive Rules 1983	Lightning arrestors are provided and maintained as per the requirement under Rule 116 the Explosive Rules 1983	Y	Mines Manager
	Fire (can be caused by unsafe practices or as arson)	Empty packages shall be removed immediately and destroyed. No smoking or any source of light or fire shall be allowed near explosives storage	The Explosive Rules 1983 MMR -1961	Follow the instructions Specified in Rule 154, 156 and 170 of MMR – 1961 for storage, and handling of Explosives. Rule 97 and 101 of the ER 1983	Y	Mines Manager, Mines Foreman (Blasting)
	Sabotage	Security shall be provided at the magazine Shortage and theft of explosive shall be reported to the nearest police station and the licensing authority	The Explosive Rules, 1983,	Round the clock security guards provided and immediate reporting to nearest Police Station and Licensing Authority done in case of thefts or	Y	Mines Manager



					sabotage as per Rule – 123 of ER 1983		
2	Rock falls or slide due to lack of bench face stability (bodily Injuries)	Improper design of bench	Proper catch bench design and proper blasting pattern reduces over break Maintain the width to height ratio as per DGMS	MMR-1961	Procedure for opencast working as per Reg. 106	Y	Mines Manager
		Force Majeure (such as heavy floods or rainfall)	Dewatering or culverting the storm water may reduces slides of bench	MMR-1961.	Following procedures as per Reg. 127 and 130 of MMR – 1961 for Dewatering or and culverting the water	Y	Mines Manager
		Improper blasting practices	Good design of blasting network is important to reduce rock fall and slides of bench face	MMR-1961.	Procedure for opencast working as per Reg. 106	Y	Mines Manager
		Incompetent blasting personnel	Shot firer should have shot firer's permit granted under explosive rules	MMR -1961	Appointment of Shot firer as provided in Reg. 160 of MMR 1961	Y	Mines Manager



3	Vehicle accident (bodily injuries)	Head on collision between vehicle and another vehicle (due to poor visibility or incompetent drivers)	Haul road should be sprinkled Regularly Driving at night shall be avoided Driver should be RTO licensed holder for driving vehicle	MMR – 1961 Motor Vehicle Act	Sprinkling of water in haul road as per Reg. 124 MMR 1961 and appointment of RTO licensed drivers	Y	Mines Manager
		Poor vehicle maintenance	Periodic servicing of vehicle Brakes and steering apparatus should be in good condition Headlight and tail light of the vehicle should be in good condition	MMR 1961	Procedure for Maintenance of Vehicles under Reg. 176 of MMR -1961	Y	Mines Manager
4	Unintended explosion or exposure to overpressure, charging blast holes	Poor access control of blast area	Well planning is required before and after charging of blast holes. Blast sites should be secured and warning signs posted before loading boreholes.	MMR 1961	Procedure for drilling charging stemming and firing of holes as per Reg.162	Y	Mines Manager



	Incompetent blasting personnel	Shot firer should have shot firer's permit granted under explosive rules	MMR 1961	Appointment of Shot firer as per Reg. 160 as per MMR 1961	Y	Mines Manager
	Poor blasting practices	Tamping rod of wood must be used, iron or steel rods should not be used. No smoking or any source of light or fire shall be allowed near explosives storage. Before loading the blast hole blaster should check the driller log Blast sites should be secured and warning signs posted before loading boreholes.	MMR – 1961 - The Explosive Rules, 1983,	Procedure for drilling charging stemming and Firing of holes as per Reg. 161, Rule 14 of ER ISO procedure QSP-760-06	Y	Certified Blaster
	Defective explosives	Explosive used should be purchased only from approved and licensed authority only If deteriorated or service able explosive is found, seek advice of	The Explosive Rules, 1983	Explosive are purchased from Approved manufactured or authorized license holder from CCE.	Y	Mines Manager



			licensing authority				
		Outdated explosives	Stock should be drawn upon strict rotation	The Explosive Rules, 1983	Issue of explosives on first come first ISO procedure QSP-760-06	Y	Mines Manager
5	Hit by fly rock (bodily injuries) During blasting	Poor access control of blast area	Adequate blast area security must be provided. Blast sites should be secured and warning signs posted before loading boreholes. Post guards at the access points to prevent unauthorized entry	MMR – 1961	Procedure for tacking shelter etc. during drilling and blasting Reg. 164 of MMR 1961	Y	Mines Foreman (Blasting)
		Poor blasting practices (leading to excessive fly rock)	Burden, spacing, hole diameter, stemming, sub drilling, initiation system, and type of explosive used matched the characteristics of the rock formation. Adequate blasting Shelter must be used for the persons whose presence	DGMS/(Tech) Ci r.No.2 of 2003	Procedure for drilling andblasting, tacking shelteretc. as per Reg. 164 MMR1961, DGMS (SOMA)/(Tech) Cir.No.2 of 2003	Y	Certified Blaster (MMR)



			<p>is required in blasting</p> <p>Nobody should be present within 300 m radius of blasting site as per DGMS circular except blasting personnel.</p> <p>Practice for controlled blasting Technique with milli-second delay detonators/ electric shock tubes/ cord relays. Training of persons and their helpers engaged in such blasting operation.</p>				
6	Hit by Machineries – Electrical Equipment (bodily injuries)	Poor machinery Maintenance	<p>Periodic servicing of machineries</p> <p>Periodic Inspection / Audit of Machineries and Structures</p> <p>Non Compliance to SOP</p>	MMR 1961	<p>Procedure laid under Section 174 Chapter XVI – Machinery and Plant of MMR 1961</p>	Y	Mines Manager
		Poor Cabling / Earthing To Rotating	<p>Periodic servicing of electrical instruments.</p> <p>Periodic</p>	Indian Electricity Rules 2003	<p>Section VII – Works of Licensees of Indian Electricity Rules</p>	Y	Electrical In charge under Mines Rules 1951



	Equipmen ts	Inspection / Audit of Electrical equipments – cables and accessories Non Compliance to SOP		2003		
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7.4 DISASTERS MANAGEMENT PLAN

All types of industries face certain types of hazards which can disrupt normal activities abruptly. The disaster could be due to fires, inundation, failure of machinery, explosion etc. The following natural/industrial problems may be encountered during the mining operations:

- Mine accidents
- Fire
- Land slides
- Earthquakes
- Rainfall /nallas/rivers may flow to the maximum extend causing flood like situation to the villages /houses / hutments constructed along the river/nalla banks.

All emergency situations in the areas whether these are incidental to mining or otherwise need following arrangements:

- Emergency procedure / management plan should be readily available and should come into force without wasting time and to assist district administration / police / medical authorities of the area.
- Withdrawal of persons from the affected areas.
- Siren / signals to inform the surrounding population likely to be effected by emergency.
- To provide emergency facilities available at the mines at such time.

Environmental Risks:

Any likely risk on surrounding environment needs mitigation .In table below risk involved and mitigation measures required are deliberated.

Table-7.5 Environmental Risk and Mitigation Measures

Risk	Mitigation Measures
Earth quakes may cause sliding of benches/ slops/ external dumps.	Proper benching, terracing on dumps is essential.
Impact on surface water bodies	No diversion of water bodies, regular cleaning of silts.
Surface drainage pattern	Speed of flow of water in the mining area should be reduced by construction of gully plugs and check dams on slops
Increased traffic/ traffic in the night	The capacity of the road in area should be adequate to take increase traffic. As far as possible traffic in the night should be avoided.
Noise and Vibration	No drilling and blasting should be carried during mining activities in the night is avoided.
Deforestation	Phase wise plantation program will be done



7.4.1 Disaster Management Plan:

The Disaster Management Plan (DMP) is supposed to be a dynamic, changing, document focusing on continual advantage of doing this is to have a system that is in synchronicity with commonly used SHE systems such as ISO 14001 and OHSAS 18001.

7.4.2 Policy

The Safety Health and Environmental (SHE) policy is existing & accessible to all at site and to other stakeholders. The policy has been framed considering legislative compliance, stakeholder involvement, continual improvement, and management by objectives.

7.4.3 Planning

Identification and Prevention of Possible Emergency Situations

Possible emergency situations can broadly be classified into unintended explosions, vehicle collision, and inundation. Additional emergency situations can be developed on the basis of audit or other procedures prior to commencement of operations.

Emergency Prevention

Some of the ways of preventing emergencies are as follows:

- Preparation of a Preventive Maintenance Schedule Program and also covering maintenance schedules for all critical equipments and instruments as per recommendations of the manufacturers user manuals,
- Importantly, it is of great importance to collect and analyze information pertaining to minor incidents and accidents at the site, as well as for recording near-misses or emergencies that were averted. This information gives an indication of how likely or unlikely it is for the site to face actual emergency and what shall be further action to prevent them from occurring.
- Establishment of an ongoing training and evaluation program, incorporating the development of capabilities amongst employees about potential emergencies and ways and means of identifying and averting the same. Most emergencies do not occur without some incident or an abnormal situation. So there is always sometime of few seconds to few minutes to arrest an incident of abnormal situation from turning in to an emergency. This is the role of the shift in-charge who is the incident controller (IC) along with his shift team.

Emergency Plan Objectives

Specific objectives of the Emergency Response Plan are to be clearly listed with regards to the responses desired for successful management of the possible emergency situations. Suggested Objectives could include:

- To define and assess emergencies, including risk and environmental impact assessment.
- To control and contain incidents.
- To safeguard employees.
- To minimize damage to property or / and the environment.
- To inform employees, the general public and the authority on the hazards / risks assessed.
- Safeguard provided residual risk if any and the role to be played by them in the event of emergency.
- To inform authorities like Safety and Fire Dept and Mutual Aid Centers to come up for help.
- For effective rescue and treatment of casualties and to count the injured.
- To identify and list fatal accidents if any.
- To secure the safe rehabilitation of affected areas and to restore normally.
- To provide authoritative information to the news media.



- To preserve records, equipments etc. and to organize investigation into the cause of the emergency and preventive measures to stop its recurrence.
- To ensure safety of staff and patients and resume work.
- To work out a plan with all provisions to handle emergencies and to provide for emergency.
- Preparedness and the periodical rehearsal of the plan.

The objectives are suggested in emergency preparedness plan of TCL. Responsibilities, resources and timeframes require to be allocated for implementing the objectives.

7.4.4 Implementation

Allocation of Resources

Key Personnel are identified for carrying out specific and assigned duties in case of any kind of Emergency. All such key personnel shall be available on call on holidays and off duty also.

- Commander (Manager Quarries)
- Deputy commander (Personnel Officer)
- Site Incident Controller (Shift in charge)
- Deputy Incident Controller (Senior Mining Mate)
- Other key personnel
- Essential workers

Responsibilities of Commander / Deputy Commander

- To take charge at the place of incident.
- To activate the Emergency Preparedness Plan according to severity of situation.
- Inform all the employees and relatives of the affected employees.
- Call all key personnel and inform Doctor to be ready for treatment.
- Commander shall deploy staff carry out following functions.
- ✓ To coordinate and reinforce Emergency Combat at Site along with Site Incident Controller.
- ✓ To liaise with other Departments and guide their personnel.
- ✓ To supervise Assembly and Evacuation at all points.
- ✓ To look after Patients who are bed ridden and any Casualties and give psychological support.
- Activate Assembly and Evacuation Plan if required as per situation by ordering Site Incident Controller.
- Inform and liaise with Chief Operating Officer, Police department and District Emergency Authority.
- Arrange for chronological records of emergency to be maintained.
- Issue authorized statements to News Media.
- Ensure that proper consideration is given for preservation of evidence and arrange for video shooting / photographs.
- Deputy Commander shall carry out the responsibilities of Commander in his absence and assist him in his duties when present.
- Assign Medicare and Emergency Management tasks to all persons of management cadre.

Responsibilities of Mines Foreman

- To take immediate charge at the site of incident.
- Ensure that immediate steps as per Emergency Preparedness Plan are taken and direct the worker staff.
- Inform Commander, Deputy Commander and other key personnel's.
- Shall blow the Siren / Hooter as per situation to declare Emergency.
- Supervise assembly and evacuation as per plan, if required.



- Appoint more than one Deputy Incident Controller to take charge if emergency occurs at more than one place.
- Ensure that Commander has been alerted.
- Take decisions for controlling the emergency till arrival by Commander.
- Ensure that casualties are receiving adequate attention and medical care.
- Ensure accounting for personnel and rescue of missing persons.
- Control traffic movement in Quarry premises.
- When emergency is prolonged arrange for relief of rescue workers and catering facilities.
- Deputy Incident Controller shall take charge at site of emergency in the absence of Site Incident Controller.
- In the presence of same, he shall assist Site Incident Controller or take charge at another location, if emergency exists in more than one place.

Responsibilities of Essential Workers

A task force of essential trained staff is made available to get work done by Incident Controllers. Such work shall include -

- Fire fighting and spill control till fire brigade takes the charge.
- To help the fire brigade, if it is so required.
- Emergency engineering work e.g. isolating equipment, materials, urgent repairing or replacement, electrical work etc.
- Provision of emergency power, water, lighting, material, etc.
- Movement of equipment, special vehicle and transport to or from the scene of the incident.
- Search, evacuation, rescue and welfare. First - Aid and medical help.
- Manning of assembly points to record the arrival of evacuated personnel. Manning of outside shelters and welfare of evacuated persons there.
- Assistance at casualty's reception areas to record details of casualties.
- Assistance at communication center to handle outgoing and incoming calls and to act as messengers if necessary.
- Control of traffic at Quarry premises.

7.4.5 Setting up of Emergency Infrastructure

To enable the key persons to implement the DMP, the following infrastructure will require to be set up:

Assembly Points

In case of emergency the site needs to be evacuated immediately. On evacuation people will go to pre-assigned assembly points. The charge will be taken by shift in charge and in his absence person deployed by Commander will be in charge of respective assembly points and will supervise Assembly and Head Count. A Board indicating the Assembly Point having relevant information is placed at point for guidance.

Liaison with State Authorities

Government authorities, local hospital, police fire services, taluka mamlatdar, district collector will be kept informed about the occurrence and development of any incident by Commander and procure necessary help and guidance from these authorities.

Task Force of Essential Staff

A task force of essential trained staff is made available to get work done by the Commander. Task Force personnel shall be trained to perform tasks as mentioned above.



Emergency Control Center

Manager-Quarry Office will act as Emergency Control Center and provided with required communication facilities. The Control Center is situated in an area of minimum risk and close to the road to allow for ready access by a vehicle if other systems fail or extra communication facilities are needed to be set up. The Emergency control center should consist of following items:

- External telephones
- Internal telephones
- E-Mail facilities
- Emergency plan
- Stationeries
- Torches and emergency lights.

Fire Fighting

Person noticing the fire shall immediately raise alarm and ask the nearest person to inform Matron and Manager-Quarry.

Portable Fire Extinguisher shall be used in an attempt to extinguish the fire, by the person at site.

Matron shall assess the severity of fire and if likely to be severe shall take following steps -

- Call fire tenders and mobile trailer pump from nearby fire department.
- Call for assembly of all persons at assembly points
- Arrange for turning "OFF" main switch of electricity supply.
- Manager-Quarry shall review the steps taken by Matron in his capacity as commander and establish a "Control Room" in his office.

Immediate Step in Case of Explosion:

At first the concerned security guard should inform about it to the shift-in-charge and Mgr.-Quarry. They will take the precaution described in the Work Instruction.

Further Steps in Case of Fire Spreading

Commander shall continuously assess the situation and if it is not being controlled then ensure:

- Assembly of all persons at the assembly points.
- Arrival of fire tenders and / or Mobile Trailer Pump.
- Ensure evacuation in orderly fashion.
- Ensure that any vehicle parked near the Fire Site is taken away to safe area.
- Carry out responsibilities as detailed as above.

Emergency Preparedness for Electrical Shock / Accident

(Applicable in Case of Mechanized Sizing):

- Source of power should be put off immediately in case of any electrical shock.
- Injured person should be shifted to safe place.
- Persons engaged in rescuing operation should use all PPEs and take appropriate precaution while removing the injured persons.
- Trained persons are engaged to give first-aid treatment to injured persons.
- In case of major injury the injured is shifted to the Dispensary/Hospital.
- In case of electrical fire, only CO2 type Fire Extinguisher is used.
- Accident report in prescribed form is sent to appropriate authority in case of reportable injury.
- All the persons engaged to carry out this operation should be equipped with appropriate PPEs (Personal Protective Equipments) like safety shoes, helmets, dust masks etc.



7.4.6 Natural Disasters

Quarry being a single storey building, built on elevated base is structurally safe from effects of Natural Disasters. It affords shelter against cyclone and flood.

Cyclone and Flood

When warning of cyclone or heavy rains is received from Local Administration, the Commander shall alert Staff to be prepared.

- Matron shall withdraw the entire person from work place and accumulate them in quarry building.
- All the equipment should be withdrawn from mine and kept in a higher site.
- The Quarry Manager may advise to leave the staff depending on security of situation.

Earthquake

- When earthquake hits, all persons shall be encouraged to run out in the open areas designated as Assembly Points.
- All the electrical supply should be disconnected by the electrical department.
- All key personnel shall reach Quarry immediately and carry out designated responsibilities.
- All the electrical supply should be disconnected by the electrical department.
- Steps detailed in Emergency preparedness are to be carried out.
- As soon as earthquake tremor stops - Site Incident Controller (Matron) shall :
- Check all areas to ensure that all fires are doused.
- Check all areas for persons trapped inside.
- Search and Rescue Operation shall be launched with help of Workers, if there is obvious damage to building.

First Aid

Basic items in a first aid kit consist of items listed in Table 7.5.

Table 7.6: Suggested Items in First Aid Kit

S. No.	Description	Quantity
1.	First aid leaflet	1 copy
2.	Sterilized finger dressing	10 nos.
3.	Sterilized hand or foot dressing	10 nos.
4.	Sterilized body or large dressing	6 nos.
5.	Sterilized burns dressing -small	4 nos.
6.	Sterilized burns dressing -large	2 nos.
7.	Sterilized burns dressing – extra large	6 nos.
8.	Sterilized cotton wool (25 gm)	2 tubes
9.	Cetavolon (28 gm)	2 tubes
10.	Eye pads	6 nos.
11.	Adhesive plaster	1 spool
12.	Assorted roller bandage	6 nos.
13.	Triangular bandages	6 nos.
14.	Safety pins	6 nos.
15.	Scissors, ordinary, 12.7cms, both sides sharp	1 pair
16.	Savlon liquid, 150 ml, or equivalent	2 nos.
17.	Cotton wool for padding, 100 gm	2 packets
18.	Eye Ointment of sulphacetamide preparation	1 tube
19.	Loose woven gauze (28"x8"), compressed pack	1 packet
20.	Aspirin, 300 mg (10 tablets)	5 strips



21.	Scribbling Pad, 4"x 6" with a pencil in a plastic cover	1 no.
22.	Adhesive dressing strips	10 strips
23.	Field dressing of modified army pattern	3 nos.
24.	Record cards in a plastic cover	1 set
25.	Torch, medium size without cells	1 no.
26.	Eye wash	1 no.
27.	Wooden splints, small	1 set
28.	Wooden splints, big	1 set

Treatment of affected persons

- i. Injured / Affected persons shall be provided suitable first-aid treatment and sent to Co.'s Doctor for further treatment depending on injury.
- ii. Patients requiring further treatment shall be sent in Ambulances to Hospitals in Porbandar.
- iii. Patients suffering from minor problems shall be discharged and sent home after preliminary treatment.

7.4.7 Post Emergency Activities

Medical checkup: Medical checkup of affected persons if any and suitable medical aid shall be provided.

Collection of Records: Exact information shall be collected regarding cause of Emergency and remedial measures suggested preventing recurrence.

Inquiry: Detailed inquiry shall be carried out to find out cause which will be in the form of fact finding and recommendations made to suitable authority.

Insurance Claims (if any): Insurance claims for damage due to consequences of emergency shall be filed.

7.4.8 Mock Drill

Full scale mock drill shall be conducted at least once a year in coordination with Safety Department.

Manager-Quarry shall declare the emergency for mock drill and all persons concerned shall perform duties as per Responsibilities given in this Plan.

7.4.9 Training

Regular training of all concerned personnel will be conducted to enable the Staff to face any type of Emergency be it Natural Disasters, Fire in Equipment, Building or any explosion in quarry.

7.4.10 DMP Audit, Non Conformance and Corrective Action and Preventive Action

Since this DMP has been designed as a dynamic document, it is required that its performance be audited at regular intervals. Ideally, persons auditing the DMP should be external auditors (i.e. not employed at the site being audited). The audit should result in a set of findings that are put before the site management for review.

Audits will be periodic, at intervals that are decided by the Head Office. Audit reports shall state the exact non-compliance with the particular clause of this DMP, and should include steps to be taken to attain compliance, through corrective and preventive actions.

7.4.11 Training and Human Resources Development

- i. Appointment and delegating qualified and experienced personnel in various disciplines.
- ii. Adequate training/refresher training will be provided to the supervisors, workers keeping in view provisions of Mines Vocational Training Rules, 1966; Mine Rules, 1955, Mines Rescue Rules, 1985.
- iii. Personnel who have to operate and maintain HEMM, Trucks etc are to be trained under the guidance of the manufacturers and as per provisions of DGMS Circular Technical 1/1989 regarding



accidents in opencast mines. Recommendation of Seventh Conference on Safety in Mines on “Safety in Open Cast Mining”, “Traffic Rules and Procedures”, “Mobile equipments and Highway Delivery Vehicles”, “Operations and Operator Training” and other related circulars.

- iv. The training of mine personnel shall be provided regularly with respect to environmental protection.
- v. Special courses for employees will be arranged for afforestation, revegetation, reclamation, health hazards (identification), malaria eradication and HIV prevention etc in the training centre of the company.

7.5 OCCUPATIONAL HEALTH HAZARDS

Dry-pit mining by open cast method involves dust generation by excavation, loading and transportation of mineral. At site, during excavation and loading activity, dust is main pollutant which affects the health of workers whereas environmental and climatic conditions also generate the health problems. Addressing the occupational health hazard means gaining an understanding of the source (its location and magnitude or concentration), identifying an exposure pathway (*e.g.* a means to get it in contact with someone), and determination of likely a receptor (someone receiving the stuff that is migrating). Occupational hazard due to stone mining mainly comes under the physical hazards. Possible physical hazards are as below mention:

7.5.1 Physical Hazards Due To Mining Operations

Following health related hazards were identified due to stone mining operations to the workers:

- a) **Light:** The workers may be exposed to the risk of poor illumination or excessive brightness. The effects are eye strain, headache, eye pain and lachrymation, congestion around the cornea and eye fatigue.
- b) **Heat and Humidity:** The most common physical hazard is heat. The direct effects of heat exposure are burns, heat exhaustion, heat stroke and heat cramps; the indirect effects are decreased efficiency, increased fatigue and enhanced accident rates. Heat and humidity are encountered in hot and humid condition when temperatures and air temperatures increase in summer time up to 48°C or above in the river bed mining area.
- c) **Eye Irritation:** During the high windy days in summer the stone could be the problems for eyes like itching and watering of eyes.
- d) **Respiratory Problems:** Large amounts of dust in air can be a health hazard, exacerbating respiratory disorders such as asthma and irritating the lungs and bronchial passages.
- e) **Noise Induced Hearing Loss:** Drilling, Blasting and Machinery is the main source of noise pollution at the mine site.

7.5.2 Medical Examination Schedule

To minimize the health impacts PPE like dust masks, ear plugs/ muffs and other equipments will be provided for use by the work personnel. All workers will be subjected to Initial Medical Examination as per Mines Rule 1955 at the time of appointment. Periodical Medical Examination will be conducted at least once in five years. Medical camps will be organized. The detail of health check up and periodical medical examination schedule is given below.

Table 7.7: Medical Examination Schedule

S. No	Activities	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
1.	Initial Medical Examination (Mine Workers)					
A.	Physical Check -up		-	-	-	-



B.	Psychological Test		-	-	-	-
C.	Audiometric Test		-	-	-	-
D.	Respiratory Test					
2.	Periodical Medical Examination (Mine Workers)					
A.	Physical Check -up	-				
B.	Audiometric Test	-				
C.	Eye Check -up	-				
D.	Respiratory Test	-				
3.	Medical Camp (Mine Workers and Nearby Villagers)	-				
4.	Training (Mine Workers)					

Note: Medical Follow Ups Work force will be divided into three targeted groups age wise as follows:

Age Group	PME as per Mine Rule 1955	Special Examination
Less than 25 years	Once in a Three Years	In case of emergencies
Between 25 to 40 Years	Once in a Three Years	In case of emergencies
Above 40 years	Once in a Three Years	In case of emergencies

Conservation plan for Himalayan wolf (*Canis lupus*)

Zoological name - *Canis lupus*

The gray wolf or grey wolf (*Canis lupus*), also known as the timber wolf or western wolf is a canine native to the wilderness and remote areas of Eurasia and North America. It is the largest extant member of its family, with males averaging 43–45 kg (95–99 lb), and females 36–38.5 kg (79–85 lb). Like the red wolf, it is distinguished from other *Canis* species by its larger size and less pointed features, particularly on the ears and muzzle. Its winter fur is long and bushy, and predominantly a mottled gray in color, although nearly pure white, red, or brown to black also occur. As of 2005, 37 subspecies of *C. lupus* are recognised by MSW3.

The gray wolf is the second most specialised member of the genus *Canis*, after the Ethiopian wolf, as demonstrated by its morphological adaptations to hunting large prey, its more gregarious nature and its highly advanced expressive behavior. It is nonetheless closely related enough to smaller *Canis* species, such as the eastern wolf, coyote, and golden jackal to produce fertile hybrids. It is the only species of *Canis* to have a range encompassing both the Old and New Worlds, and originated in Eurasia during the Pleistocene, colonizing North America on at least three separate occasions during the Rancholabrean. It is a social animal, travelling in nuclear families consisting of a mated pair, accompanied by the pair's adult offspring. The gray wolf is typically an apex predator throughout its range, with only humans and tigers posing a serious threat to it. It feeds primarily on large ungulates, though it also eats smaller animals, livestock, carrion, and garbage.

The gray wolf is one of the world's best known and well researched animals, with probably more books written about it than any other wildlife species. It has a long history of association with humans, having been despised and hunted in most pastoral communities because of its attacks on livestock, while conversely being respected in some agrarian and hunter-gatherer societies. Although the fear of wolves



is pervasive in many human societies, the majority of recorded attacks on people have been attributed to animals suffering from rabies. Non-rabid wolves have attacked and killed people, mainly children, but this is rare, as wolves are relatively few, live away from people, and have developed a fear of humans from hunters and shepherds.



CLASSIFICATION

Kingdom	<u>Animalia</u> – Animal, animaux, animals
Subkingdom	<u>Bilateria</u>
Infrakingdom	<u>Deuterostomia</u>
Phylum	<u>Chordata</u>
Subphylum	<u>Vertebrata</u>
Infraphylum	<u>Gnathostomata</u>
Superclass	<u>Tetrapoda</u>
Class	<u>Mammalia</u>
Subclass	<u>Theria</u>
Infraclass	<u>Eutheria</u>
Order	<u>Carnivora</u>
Suborder	<u>Caniformia</u>
Family	<u>Canidae</u>
Genus	<u>Canis</u>
Species	Canis lupus



Conservation Status



IUCN: Others (LC) ver. 3.1

IWPA: Schedule I

CITES: Appendix-I

Geographical Distribution: Pakistan, India and Sri Lanka. Many feral populations exist throughout the world.

The Himalayan wolf is formed by one haplotype that currently falls within the Tibetan wolf (*Canis lupus chanco*) subspecies, but based on mDNA sequencing has been proposed as a separate species *Canis himalayensis*. The Indian gray wolf is formed by two closely related haplotypes that fall within the Indian wolf (*Canis lupus pallipes*) subspecies, but based on mDNA sequencing has been proposed as a separate species *Canis indica*. Neither proposal has been endorsed because they relied on a limited number of museum and zoo samples that may not have been representative of the wild population, and a call for further fieldwork has been made. Based on a fossil record estimate that the divergence time between the coyote and the wolf lineages occurred one million years ago and with an assumed wolf mutation rate, one study estimated the time of divergence of the Himalayan wolf and the Indian gray from the wolf/dog ancestor to be 800,000 years and 400,000 years ago respectively. Another study, which expressed some concerns with the earlier study, gave an estimate of 630,000 ago years and 270,000 ago years respectively. During Pleistocene glaciations these wolf lineages were isolated in refuges. In 2007, a study found that the Indian gray wolf was basal to all extant gray wolves and that the Himalayan wolf belonged to a different clade. In 2010, a study found that these two wolves formed a separate clade being 6 mutations distant from the extant gray wolf, which indicated distinct (i.e. different) lineages. In 2012, a limited genetic analysis of the scats of 2 Himalayan wolves from remote and widely separated areas reconfirmed their basal lineage.

The taxonomic reference *Mammal Species of the World* (2005) does not recognize *Canis himalayensis* nor *Canis indica*, however NCBI/Genbank lists a new subspecies *Canis lupus himalayensis* as separate from *Canis lupus chanco*, and a new subspecies *Canis lupus indica* as separate from *Canis lupus pallipes*.

Habitat:

The gray wolf is a habitat generalist, and can occur in deserts, grasslands, forests and arctic tundras. Habitat use by gray wolves is strongly correlated with the abundance of prey, snow conditions, absence or low livestock densities, road densities, human presence and topography. In cold climates, the gray wolf can reduce the flow of blood near its skin to conserve body heat. The warmth of the footpads is regulated independently of the rest of the body, and is maintained at just above tissue-freezing point where the pads come in contact with ice and snow. Gray wolves use different places for their diurnal rest: places with cover are preferred during cold, damp and windy weather, while wolves in dry, calm and warm weather readily rest in the open. During the autumn-spring period, when wolves are more active, they willingly lie out in the open, whatever their location. Actual dens are usually constructed for pups during the summer period. When building dens, females make use of natural shelters such as fissures in rocks, cliffs overhanging riverbanks and holes thickly covered by vegetation. Sometimes, the den is the appropriated burrow of smaller animals such as foxes, badgers or marmots. An appropriated den is often widened and partly remade. On rare occasions, female wolves dig burrows themselves,



which are usually small and short with 1–3 openings. The den is usually constructed not more than 500 metres away from a water source,^[9] and typically faces southwards, thus ensuring enough sunlight exposure, keeping the denning area relatively snow free.^[3] Resting places, play areas for the pups and food remains are commonly found around wolf dens. The odour of urine and rotting food emanating from the denning area often attracts scavenging birds such as magpies and ravens. As there are few convenient places for burrows, wolf dens are usually occupied by animals of the same family. Though they mostly avoid areas within human sight, wolves have been known to nest near domiciles, paved roads and railways.

Diet

All social terrestrial mammalian predators feed mostly on terrestrial herbivorous mammals with a body mass similar to the combined mass of the social group members attacking the prey animal, and a pack of timber wolves can bring down a 500 kg moose as their preferred prey. The gray wolf generally specializes in vulnerable individuals of large prey. In Eurasia, many gray wolf populations are forced to subsist largely on livestock and garbage in areas with dense human activity, though wild ungulates such as moose, red deer, roe deer and wild boar are still the most important food sources in Russia and the more mountainous regions of Eastern Europe.

Other prey species include reindeer, argali, mouflon, wisent, saiga, ibex, chamois, wild goats, fallow deer and musk deer. The prey animals of North American wolves have largely continued to occupy suitable habitats with low human density, and cases of wolves subsisting largely on garbage or livestock are exceptional. Animals preferred as prey by North American wolves include moose, white-tailed deer, elk, mule deer, bighorn sheep, Dall's sheep, American bison, muskox and caribou.

Although wolves primarily feed on medium to large sized ungulates, they are not fussy eaters. Smaller sized animals that may supplement the diet of wolves include marmots, hares, badgers, foxes, weasels, ground squirrels, mice, hamsters, voles and other rodents, as well as insectivores. They frequently eat waterfowl and their eggs. When such foods are insufficient, they prey on lizards, snakes, frogs, rarely toads and large insects as available. In times of scarcity, wolves readily eat carrion, visiting cattle burial grounds and slaughter houses. Cannibalism is not uncommon in wolves: during harsh winters, packs often attack weak or injured wolves, and may eat the bodies of dead pack members. Wolf packs in Astrakhan hunt Caspian seals on the Caspian Sea coastline and some wolf packs in Alaska and Western Canada have been observed to feed on salmon. Humans are rarely, but occasionally preyed upon. Other primates occasionally taken by wolves include grey langurs in Nepal and hamadryas baboons in Saudi Arabia.

Wolves supplement their diet with fruit and vegetable matter. They willingly eat the berries of mountain ash, lily of the valley, bilberries, blueberries and cowberry. Other fruits include nightshade, apples and pears. They readily visit melon fields during the summer months. A well-fed wolf stores fat under the skin, around the heart, intestines, kidneys, and bone marrow, particularly during the autumn and winter. Digestion only takes a few hours, thus wolves can feed several times in one day, making quick use of large quantities of meat.

Life Cycle

The gray wolf is generally monogamous, with mated pairs usually remaining together for life, unless one of the pair dies. Upon the death of one mated wolf, pairs are quickly re-established. Since males often predominate in any given wolf population, unpaired females are a rarity. If a dispersing male gray wolf is unable to establish a territory or find a mate, he mates with the daughters of already established breeding pairs from other packs. Such gray wolves are termed "Casanova wolves" and, unlike males from established packs, they do not form pair bonds with the females they mate with. Some gray wolf packs may have multiple breeding females this way, as is the case in Yellowstone National Park. Gray



wolves also practice alloparental care, in which a wolf pair may adopt the pup or pups of another. This might take place if the original parents die or are for some reason separated from them. In addition to heterosexual behavior, homosexual behavior has been observed in gray wolves. Male gray wolves often mount each other when the highest ranking female in the pack comes into heat.

Illustration of various gray wolf growth stages

The age of first breeding in gray wolves depends largely on environmental factors: when food is plentiful, or when wolf populations are heavily managed, wolves can rear pups at younger ages in order to better exploit abundant resources. This is further demonstrated by the fact that captive wolves have been known to breed as soon as they reach 9–10 months, while the youngest recorded breeding wolves in the wild were 2 years old. Females are capable of producing pups every year, with one litter annually being the average. Unlike the coyote, the gray wolf never reaches reproductive senescence.^[74] Estrus typically occurs in late winter, with older, multiparous females entering estrus 2–3 weeks earlier than younger females.^[9] During pregnancy, female wolves remain in a den located away from the peripheral zone of their territories, where violent encounters with other packs are more likely. Old females usually whelp in the den of their previous litter, while younger females typically den near their birthplace. The gestation period lasts 62–75 days, with pups usually being born in the summer period.

Wolves bear relatively large pups in small litters compared to other canid species. The average litter consists of 5–6 pups, with litter sizes tending to increase in areas where prey is abundant, though exceptionally large litters of 14–17 pups occur only 1% of the time. Pups are usually born in spring, coinciding with a corresponding increase in prey populations. Pups are born blind and deaf, and are covered in short soft grayish-brown fur. They weigh 300–500 grams at birth, and begin to see after 9–12 days. The milk canines erupt after one month. Pups first leave the den after 3 weeks. At 1.5 months of age, they are agile enough to flee from danger. Mother wolves do not leave the den for the first few weeks, relying on the fathers to provide food for them and their young. Pups begin to eat solid food at the age of 3–4 weeks. Pups have a fast growth rate during their first four months of life: during this period, a pup's weight can increase nearly 30 times. Wolf pups begin play fighting at the age of 3 weeks, though unlike young foxes and coyotes, their bites are inhibited. Actual fights to establish hierarchy usually occur at 5–8 weeks of age. This is in contrast to young foxes and coyotes, which may begin fighting even before the onset of play behavior. By autumn, the pups are mature enough to accompany adults on hunts for large prey.

Relationship with Man

In 2003, a study compared the behavior and ethics of chimpanzees, wolves and humans. Cooperation among humans' closest genetic relative is limited to occasional hunting episodes or the persecution of a competitor for personal advantage, which had to be tempered if humans were to become domesticated. The closest approximation to human morality that can be found in nature is that of the gray wolf, *Canis lupus*. Wolves are among the most gregarious and cooperative of animals on the planet and their ability to cooperate in well-coordinated drives to hunt prey, carry items too heavy for an individual, provisioning not only their own young but also the other pack members, babysitting etc. are rivaled only by that of human societies. Similar forms of cooperation are observed in two closely related canids, the African wild dog and the Asian dhole, therefore it is reasonable to assume that canid sociality and cooperation are old traits that in terms of evolution predate human sociality and cooperation. Today's wolves may even be less social than their ancestors, as they have lost access to big herds of ungulates and now tend more toward a lifestyle similar to coyotes, jackals, and even foxes.



Social sharing within families may be a trait that early humans learned from wolves and with wolves digging dens long before humans constructed huts it is not clear who domesticated whom.

Conservation plan for Hanglu or Kashmir Stag (*Cervus elaphus hanglu*)

Kashmir stag (*Cervus elaphus hanglu*) complete detail – updated. Description of Kashmir stag (*Cervus elaphus hanglu*). Classification of Kashmir stag (*Cervus elaphus hanglu*). Habit and habitat of Kashmir stag (*Cervus elaphus hanglu*). They prefer to live in dense riverside forests between 1700 and 3600 meters of high valleys, and also in the mountain areas.

Kashmir stag is a herbivores animal, they feeds on flowers, leaves, and tender shoots of shrubs. Breeding season is between September to October. A stag will pursue a receptive female through the forest and uphill slopes till mating takes place. Normally one offspring per female.

The weight of male Kashmir stag is between 150 to 250 kg., and weight of female is between 100 to 160 kg. Head to body length measures about 180 to 220 cm. Age of sexual maturity is 2 to 3 years for male and 1 to 3 years for female.

Classification

Common Name – Kashmir stag

Local Name – Hangul / Red deer

Zoological Name – *Cervus elaphus hanglu*

Kingdom – Animalia

Phylum – Chordata

Class – Mammalia

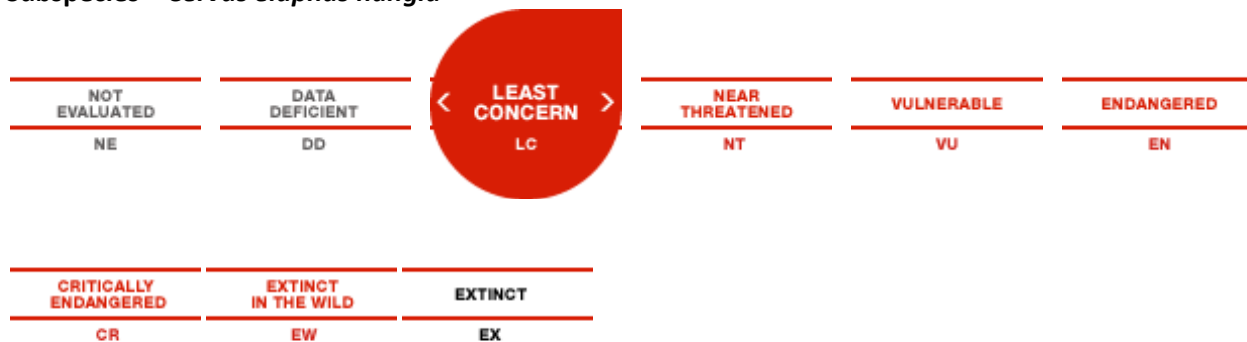
Order – Cetartiodactyla

Family – Cervidae

Genus – *Cervus*

Species – *Cervus elaphus*

Subspecies – *Cervus elaphus hanglu*



IUCN: Others (LC) ver 3.1.

IWPA: Schedule I.

CITES: Appendix-I

Conservational Status – Schedule –I, according to wildlife (Protection) act, 1972 and classified as Endangered (EN) by the IUCN.



Geographical Distribution

This deer lives in groups of two to 18 individuals in dense riverine forests, high valleys, and mountains of the Kashmir valley and northern Chamba in Himachal Pradesh. In Kashmir, it's found in the Dachigam National Park (at elevations of 3,035 meters), Rajparian Wildlife Sanctuary, Overa Aru, Sind Valley, and in the forests of Kishtwar & Bhaderwah.

Habitat

They prefer to live in dense riverside forests between 1700 and 3600 meters of high valleys, and also in the mountain areas.

They spent winters in the lower levels, and summer on the heights. They found in dense riverine forests, high valleys, and mountains of the Kashmir valley and northern Chamba in Himachal Pradesh.

After shedding their antlers between March to April most stags go uphill and congregate about the snow line. Kashmir stag is a social animal. They lives in groups of two to 18 individuals, sometimes found single.

Kashmir stag is a herbivores animal, they feeds on flowers, leaves, and tender shoots of shrubs. They also feed on Lichens, Mosses, Ferns, and Mushrooms.

Age of sexual maturity is 2 to 3 years for male and 1 to 3 years for female. Breeding season is between September to October. About the end of September, new antlers have hardened. They commence to roar and challenge.

They join the hinds at the beginning of October, and as the rut develops, engage in conflict. A stag will pursue a receptive female through the forest and uphill slopes till mating takes place.



Ecology

This deer lives in groups of two to 18 individuals in dense riverine forests, high valleys, and mountains of the Kashmir valley and northern Chamba in Himachal Pradesh. In Kashmir, it's found in the Dachigam National Park (at elevations of 3,035 meters), Rajparian Wildlife Sanctuary, Overa Aru, Sind Valley, and in the forests of Kishtwar & Bhaderwah.

Social Organization and Behavior

As per Bilal A. Bhat et al (2009), The rutting or reproductive activity began by late September and extended up to the first week of November. The mature stags, which may be found in small groups in summer, became intolerant of each other and separated. The rut took place in the main valley and along the slopes of lower Dachigam. The peak of the rut was from October 9 to 20 after which it faded out. This observation is similar to that of Kurt (1977) and Schaller (1969), who reported peak of rut in the second week of October.

The most conspicuous feature of rut was the reverberating resonant roaring calls by stags. During this the stag raises its muzzle slightly upward, and with partially open mouth emits the sound at high intensity. The roar is a loud resonant bugle beginning harshly and ending on a clear deep note dropping progressively in pitch.

An estimated 8-11 stags were present in rutting grounds. The stags were either solitary or had at the most 4 hinds with them. Out of 34 to 47 hangul observed, 8-11 were stags, 21-30 were hinds and 4-6 were fawns. A total of 24 breeding herds were seen, the size of which varied from 2-5 and included one large stag, one or more hinds, and occasionally they were with a fawn. On several occasions there were one or two young stags in the herd. The largest number of hinds seen with a stag was four. Solitary hinds were seen on seven occasions.

The roar by a stag often resulted in response to roars from one or more stags and then there is an exchange of roars back and forth. This roaring continued at times for about 40-43 minutes. The stags roared more frequently and spent more time standing at such times of the day when the hinds were feeding. Stags with hinds roared more and tended to spend less time feeding on days when the nearest rutting stag was close by.

The calls were mostly heard in the study area between the dawn shortly after 0600hr and the dusk till 1830hr, which is in accordance with Kurt (1977) and Schaller (1969). Roaring reached daily peaks between 0700 and 0900hr, and again between 1640 and 1830hr, but did continue even after. Counting of calls was discontinued after 1900hr. Only large stags with more than eight points were observed to roar. These mature stags had dark-brown swollen necks in contrast to the grey-brown slender necks of the young stags. From September 23 onwards the calls were heard only occasionally. The frequency of the calls varied considerably from day to day and appeared to be related to the weather condition. On warm and clear mornings stags were heard roaring less often than on rainy cool mornings. Higher numbers of calls were heard on cloudy days than on clear days.

After 20 October, the number and intensity of the roars decreased considerably indicating that the peak of rut had passed. Occasional roars were heard up to 09 November. It was also found to be related to topographic aspects. Roaring started earlier on the south facing slopes where the sun shines earlier than the north facing slopes. The roaring intensity was found to be directly related to the density of the stags in a particular area. A call by one stag frequently stimulated one or more stags to respond, sometimes for about 40-45 minutes. Since roaring tended to occur more or less at the same time intervals, it could be considered an attempt to acoustic territorial demarcation. When a rutting male



was approached by a number of young males at the same time, he always chased away the oldest or the best developed stag first. The chase-away strategy adopted by a mature stag is to steadily walk towards the rival stag that may be young or is seen with hinds.

Stags in rut were seen to trash their antlers frequently against bushes and trees. This activity was seen to continue at a stretch for 5-10 minutes. Sometimes, this behavior was more pronounced when another stag was in the close vicinity. Many small plants were thus damaged by such stags. Marks of fraying and trashing were generally easily found and represented by bark stripped more or less completely around the vertical stems of woody plants. Occasionally signs were also found on grass and soil. *Prunus sp.*, *Rosa sp.*, *Berberis lycium*, *Indigofera haterantha* and *Cotoneaster sp.* were the most common species used for antler-trashing in the broad leaved forest and the grass covered slopes. Marks of fraying were observed from 32.5 up to 180cm above the ground level, with the average ranging from 30 to 90cm. On *Prunus sp.*, fraying marks were seen from a height of 60cm up to 173cm. For *Berberis* it was from 33cm onwards and for *Rosa sp.* it ranged from 50cm up to 145cm. According to Kurt (1977) antler trashing was a means of communication to warn other males.

Courtship behavior was observed on six occasions and got disturbed on a couple of occasions due to vehicular noise from the 6 Km road to VIP lodge at Draphama in lower Dachigam. The stags stayed close to the hinds. When the hind walked, the stag followed. When the hind browsed, the stag stopped and remained standing erect behind or parallel to the hind. On 11 October 2006, a stag and a hind were observed from 0810hr till 1825hr. They remained together all the day resting most of the time. The stag made a number of attempts to mount, but was not successful. At 1741 hr the stag went round the female, placed his chin on her rump and then mounted. The stag mounted twice in quick succession. The first one was of the longest duration, of about 6 seconds followed by the 2nd, which was of 3 seconds duration. The number of calls that this stag gave throughout this observation period was 43. Only mature stags (8 tined and above) were observed to be involved in courtship.

Overall rutting was disturbed by daily convoys across the hangul habitat, and other interferences like livestock grazing, grass and fuel extraction by locals. Gruisen (1983), Shah et al. (2008) and Bhat (2008) recorded several anthropogenic disturbances impairing the normal behaviour of wild animals including hangul in DNP. Kurt (1977) has reported the clear cut difference in the behaviour of rutting stags in disturbed and undisturbed areas.

Recommendation

Restriction of vehicular traffic, to lower Dachigam during rutting season of hangul should be enforced and fully implemented.

Reproduction

Normally one offspring per female. The gestation period is 7-8 months. After dropping their fawns, the hinds too leave the lowest part of the valley and move to the upper slopes where the best and most nutritious pastures are available, and will use these areas for raising their young till the weather turns harsh, forcing them down again. Average lifespan of Kashmir stag is 15 to 20 years.

Threats

Human-Induced Habitat Loss and Degradation

These deer once numbered from about 5,000 animals in the beginning of the 20th century. Unfortunately, they were threatened, due to habitat destruction, over-grazing by domestic livestock,



and poaching. This dwindled to as low as 150 animals by 1970. However, the state of Jammu & Kashmir, along with the IUCN and the WWF prepared a project for the protection of these animals. It became known as Project Hangul. This brought great results and the population increased to over 340 by 1980.

Much of the earlier published material was by the distinguished E. P. Gee, a member of the Bombay Natural History Society. Shortly before the expedition was mounted, Fiona Guinness and Tim Clutton-Brock, both noted deer experts, had visited Kashmir and had gathered some useful field data, which confirmed that Hangul numbers were at a dangerously low level.

The animal is battling for its survival in its last bastion: they are now scattered within 141 km² of the Dachigam National Park located on foothills of Zabarwan range on the outskirts of Srinagar. During the 1940s, their number was believed to be about 3,000-5,000. As per the latest census in 2008, only around 160 exist. There are plans to breed them in captivity to increase their chances of survival.

Conservation

Population of Kashmir red deer or hangul (*Cervus elaphus hanglu*) outside Dachigam National Park accentuated by habitat suitability assessment. Study results indicate that hangul is restricted to an effective area of 351.15 Km² outside Dachigam National Park. The overall mean hangul encounter rate outside Dachigam was 0.043 hangul/kilometer walk. The overall hangul sex ratio outside Dachigam was 11.81 males/100 females and the fawn to female ratio was 5.93 fawn/100 females. The overall hangul density outside Dachigam turned out to be 0.49 hangul/Km². The isolated hangul population outside Dachigam NP and the fragile habitats therein need immediate attention for their effective management and long term conservation. Overa Wildlife Sanctuary and Shikargah Conservation Reserve are considered the alternate potential reintroduction sites for establishing a second viable hangul population outside Dachigam National Park. There is an urgent need for early initiation of the hangul conservation breeding programme for reintroduction/ repopulating existing good habitats in the hangul relic areas, beginning with the Shikargah-Overa ranges in Udder Valley.

Conservation plan for Himalayan Musk Deer (*Moschus chrysogaster*)

White-bellied musk deer are very well adapted for high altitudes; they demonstrate such adaptations as well-developed dew claws, broad toes that provide increased stability on steep slopes, and a dense coat of coarse hairs with air-filled cells to insulate against the extreme temperature. While they lack antlers, a trait notable among all musk deer, they do possess a pair of enlarged and easily broken canines that grow continuously. The maximum length of these tusks is about 10 cm (4 in). These deer have a stocky body type; their hind legs are also significantly longer and more muscular than their shorter, thinner forelimbs. In place of running or leaping, this species tends to "bound." Finally, fawns of this species have white spots to help with camouflage, but as they mature these spots disappear.

The white-bellied musk deer has a waxy substance called musk that the male secretes from a gland in the abdomen. The deer use this to mark territories and attract females, but the musk is also used in the manufacture of perfumes and medicines.

The **White-bellied musk deer** or **Himalayan musk deer** (*Moschus leucogaster*) is a musk deer species occurring in the Himalayas of Nepal, Bhutan, India, Pakistan and China. It is listed as endangered by the IUCN because of overexploitation resulting in a probable serious population decline.^[1]

It was previously considered a subspecies of the Alpine musk deer, but was separated on the basis of different skull proportions.

Musk deer have been classified with deer in the Cervidae family (Flower, 1875 and Heptner and Naumov, 1961), but today they are grouped together by many scientists into their own separate family,



the Moschidae (Brooke, 1878; Flerov, 1952; Groves and Grubb, 1987 and Whitehead, 1972). Thus Musk deer taxonomy remains debatable. While it was previously assumed that one to three species existed (Green, 1986; Groves, 1975 and Grubb, 1982), there are now thought to be at least four and possibly six or more species (Green, 1998; Groves and Grubb, 1987 and Groves et al., 1995). There is, however, broad agreement over the distinctions made for the following four species and their distribution (Green in Wemmer, 1998): ¼ Siberian Musk deer *Moschus moschiferus* (Russia, Kazakhstan, Kyrgyzstan, China, Korea and Mongolia). ¼ Forest Musk deer *M. berezovskii* (China and Vietnam). ¼ Himalayan Musk deer *M. chrysogaster* (Afghanistan, China, India, Nepal and Pakistan). ¼ Black Musk deer *M. fuscus* (Bhutan, China, India, Myanmar and Nepal). Some maintain that this is a subspecies of *M. chrysogaster*.

Common Name – Kashmir stag

Local Name – Hangul / Red deer

Zoological Name – *Cervus elaphus hanglu*

Kingdom – Animalia

Phylum – Chordata

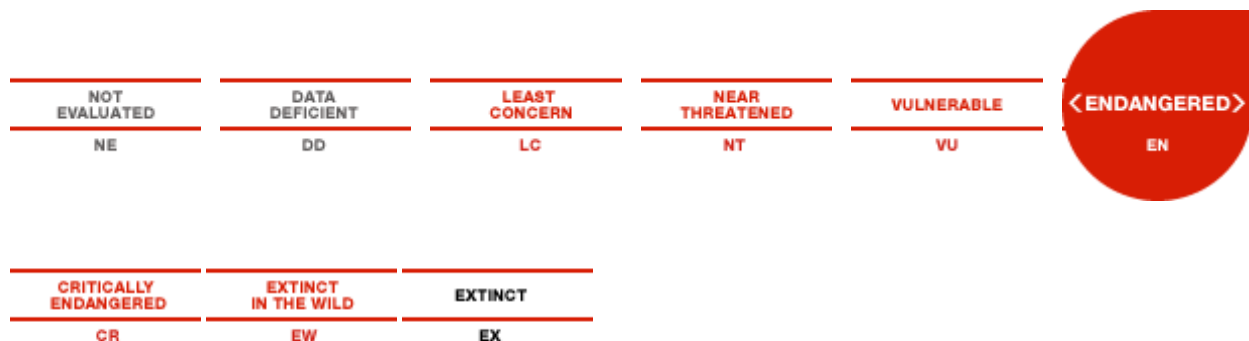
Class – Mammalia

Order – Artiodactyla

Family – Moschidae

Genus – *Moschus*

Species – *chrysogaster*



The conservation status of species of Musk deer is recorded as follows in the IUCN Red List of Threatened Animals (IUCN, 1996):

Himalayan Musk deer: Lower Risk (nt) Black Musk deer: Lower Risk (nt)



Geographical Distribution

Himalayan musk deer are found in parts of northern Afghanistan, Pakistan, Tibet, Nepal, Bhutan, and in northern parts of India such as in (Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Sikkim and Arunachal Pradesh). They inhabit high alpine environments, with the lowest occurring at 2500 m above sea level. The species is endangered due to a high volume of illegal wildlife trade within its range.

Habitat

The characteristic landscape for Musk deer constitutes mountains covered with mixed forest especially places where precipitous cliffs abound. Himalayan Musk deer occur at an altitude of 3,000 to 4,500 metres where temperate climate prevails (Green, 1986; Shrestha, 1997). Musk deer inhabit steep, forested or shrub-covered slopes, mainly in the sub-alpine zones of mountain regions. Dense undergrowth of rhododendron, bamboo and other shrubs form the typical habitat (Bannikov et al., 1978; Green, 1987a). Use of the habitat depends upon the availability of cover, food and other factors: Musk deer are very shy and solitary animals that may not become active until dusk. Male Musk deer are highly territorial, tolerating only female musk deer within their home ranges and defending their home range against other males of the species, while female territories may overlap (Green, 1998). In studies in Nepal it was found that, in regions where the population density of musk deer is high (23 individuals to 50 ha), the home range of one male overlaps with parts of the home ranges of five females but not with parts of the home range of another male (Kattel, 1992). However, in studies in northern India (Green, 1995 and 1998) it was found that in cases where the population density was low (five to six individuals / km²) the home ranges did not overlap as much as when densities were high.

Ecology

During the day, white-bellied musk deer hide in dense cover and are shy and secretive. At night, they emerge to feed in more open habitats, and preferably select leaves of trees and shrubs with high protein and low fibre contents. During the winter, they subsist on poorer quality lichens, and even climb small trees to feed upon leaves that would otherwise be out of reach.

They are fairly sedentary occupying a small home range of up to 22 hectares. Male are fiercely territorial, only allowing females to enter their range. Territories are marked by carefully placed defecation sites and strong-smelling secretions, which are placed onto the surrounding plants. Males fight each other over females during the mating season, and use their long canines to fight and defend their territories. The females hide from all the commotion. For the males to attract the females and bring them out from hiding, they use their strong smelling musk.

A female has one or two young at a time. The young musk deer live off their mother's milk until they are about six months old and able to eat regular foods available in the wild. At 16 to 24 months old, they become sexually mature.

Himalayan musk deer can live for up to 10 to 14 years.

Their predators include leopard snow leopard, Eurasian lynx, red fox, gray wolf. Juveniles were also killed by yellow-throated marten and large raptors.

Social Organization and Behavior Solitary behaviour is typical for small forest ruminants, such as Musk deer, which are guided primarily by their olfactory sense. Olfactory signalling between Musk deer is highly developed (Lai and Sheng, 1993). Socalled "latrine sites" (areas of droppings), urine markings and the musk scent of males, as well as scent from other glands found around the hoof and tail areas, are used for marking (Green, 1987c and Sokolov and Prikhod'ko, 1979 and 1983). The function of the musk scent in chemical communication is not entirely understood. Observations of red or pinkstained and sweet-smelling patches of urine in snow indicate that the musk of the male is probably emitted in the urine, while the urine of females, by contrast, is amber-coloured and does not have any noticeable smell



to humans (Green, 1987c). The scents could be used for territorial marking by animals and at the same time express something about the individual status of animals. Fights between rivals would in this way be kept to a minimum and females would learn more about potential reproductive partners.

Reproduction

Musk deer breed seasonally. The rut extends from November to early January and the young are born from May to June after a gestation period of 178-198 days. The period of gestation increases with the size of the species, from the Forest Musk deer, the smallest species, to the Siberian Musk deer, to the Himalayan Musk deer, the largest species and with the longest gestation period (Green, 1989). Litter size ranges from one to three young. Twin births predominate in Forest Musk deer and Siberian Musk deer, while single births are most common in Himalayan Musk deer. The birth weight of Musk deer varies between about 400g and 600g, depending on the species. In their first two months, the young Musk deer, like all deer species, are “nursed offspring” concealed in the undergrowth and suckled by their mothers. At the age of about two months they begin to follow their mothers and are weaned (Green, 1987a). The young grow rapidly, become independent of their mothers by the age of six months, and reach sexual maturity at 18 months of age. Female Musk deer are capable of breeding after their first year (Green, 1987a and 1989). This fact is conducive to quick growth of a population of Musk deer, relative to other large mammals, given suitable environmental conditions. The Musk deer populations of Russia were brought to the brink of extinction 14 through over-hunting in the early part of the twentieth century and were subsequently able to recover within a few decades.

Threats

As the musk the deer produces is in demand for the manufacture of perfumes and medicines, it is highly valuable. Since the species is endangered and hard to find, its value on the wildlife trade market is increased still further. The hunting and trade of the white-bellied musk deer is the main threat to the species. Deer musk may sell for as much as \$45,000/kg, making it one of the most valuable animal-derived products in the world.^[9] Hunters catch and kill the deer using snares. Only males produce the musk, so this creates a problem because females and young are caught in the traps and killed.

Conservation

The white-bellied musk deer is protected by law in Bhutan, Nepal, and India. In China, hunting may be permitted in some areas, although a license is required. It is listed as an endangered species in Pakistan and is also found in a number of protected areas throughout; however, the uneven enforcement of legislation across its range has meant little impact on preventing the rampant trade in the species.^[10] Improving the enforcement of antipoaching laws is a key priority for the conservation of this species.

Musk deer, Snow leopard and Blue sheep are beautiful animals of Manang district and attractive to tourists therefore, Musk deer and other high profile animals should be managed in such way by which local people can earn money as well as protect its natural habitat. For this, Musk deer Conservation joint sub Committee should be given technical and financial support and should be fully empowered to undertake Musk deer conservation activities. This committee is also interested to establish a natural zoo in Humde area with two pair of Musk deer and other animal of the high altitudes can be displayed for tourists as well as creating a small breeding population for future release in natural habitat, to help restore the wild population. By such means as this they want to increase tourist time spent in Humde which also directly benefits local hotel owners and suppliers of local products / services. In natural habitat CAMCs / Musk deer Conservation joint sub Committee should do regular monitoring / patrolling for conservation of Musk deer and other animals. A Core Area should fixed for Musk deer habitat where local people strictly prohibited for domestic livestock grazing and forest product collection, or any activities which may disturb Musk deer etc. ACAP should strengthen the existing Musk deer Conservation joint sub Committee by training, etc. There should be incentive programme for the



effective conservation of Musk deer in natural habitat, such as provision of alternative energy, employment opportunity, income generation activities, education development, etc. these activities help to motivate local people for the conservation of Musk deer. Below figure: showing the motivation pattern of local people for musk deer conservation.

Conservation plan for Serow (*Capricornis sumatraensis*)

Head to body length measures about 90 to 150 cm. The length of tail about 8 to 16 cm. They are about 80 to 94 cm high at the shoulder. The weight of male Serow is between 50 to 140 kg, and weight of female is between 30 to 70 kg. Serow is a beautiful animal, with uniquely distinctive pointing horns, length measures about 15 to 25 cm. The horns usually have a slight curve. They have a dark grey or black or brown colored coat, with short body and long legs. The upper parts are dark grey or black or brown with paler appearance, and the underparts are lighter in color with more paler appearance. The black color passes into rusty red on the shoulders, flanks, and lower things, and turns a dirty grey on the inside of the limbs and belly. The hair of the coat is long and coarse, and a long mane of white, brown or black occurs on the neck. The face bears large scent glands below the eyes. The head is narrow and strong, and the legs are long and strong, and lighter in color. The neck is thick and the limbs are short. They have short fairly bushy tail, and brownish black eyes. Nose skin is sensitive and bright brown-black in color. The ears are long, narrow and pointed, and brownish black in color. Both sexes are similar in appearance, with both bearing stout, slightly curved horns.

Taxonomy of serows is not completely resolved; descriptions, range maps, and assessments of conservation status in the literature vary because sources differ on nomenclature and specific/subspecific status of the various taxa. Here, we follow the taxonomy of Wilson and Reeder, 3rd edition (2005).

COMMON NAME – SEROW

LOCAL NAME – SOUTHERN SEROW

ZOOLOGICAL NAME – CAPRICORNIS SUMATRAENSIS

KINGDOM – ANIMALIA

PHYLUM – CHORDATA

CLASS – MAMMALIA

ORDER – ARTIPDACTYLA

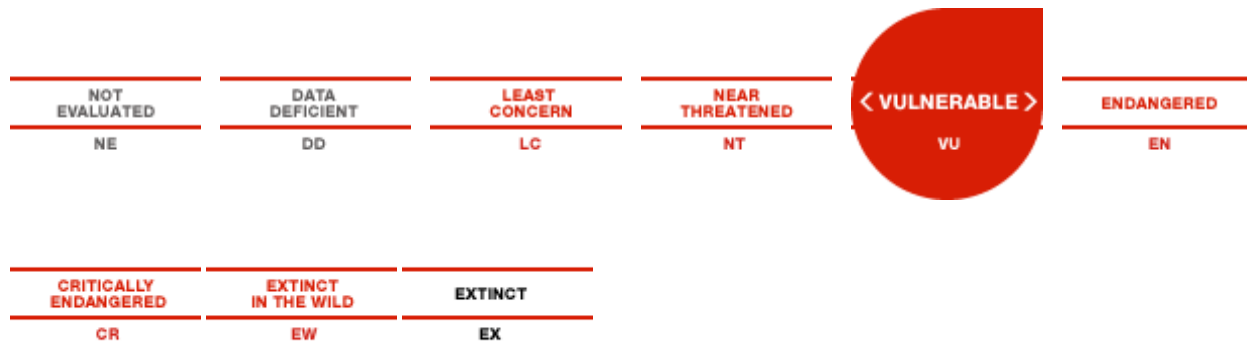
FAMILY – BOVIDE

SUBFAMILY - CAPRINE

GENUS – CAPRICOMIS

SPECIES – SUMATRAENSIS





The conservation status of species of Musk deer is recorded as follows in the IUCN Red List of Vulnerable Animals (IUCN, 1996):

Himalayan Musk deer: Lower Risk (nt) Black Musk deer: Lower Risk (nt)



Geographical Distribution

The Sumatran serow (*Capricornis sumatraensis*), also known as the southern serow, is a species of goat-antelope native to mountain forests in the Thai-Malay Peninsula and on the Indonesian island of Sumatra. The former name of this species is "mainland serow", as all the mainland species of serow (Chinese, red and Himalayan) were previously considered subspecies of this species. The Sumatran serow is threatened due to habitat loss and hunting, leading to it being evaluated as vulnerable by the IUCN. Serow (*Capricornis sumatraensis*) Saza complete detail. Description of Serow (*Capricornis sumatraensis*) Saza. Habit and habitat of Serow. Distribution of Serow. They prefer mountainous areas at altitudes of between 200 to 3,050 meter.

They are exceedingly active animal. They found from Kashmir to the Mishmi Hills in Assam, eastwards through the hill ranges of Yunan and Szechuan, the hills of Burma.

Head to body length measures about 90 to 150 cm. The length of tail about 8 to 16 cm. They are about 80 to 94 cm high at the shoulder. The weight of male Serow is between 50 to 140 kg, and weight of female is between 30 to 70 kg.

Habitat

They prefer mountainous areas at altitudes of between 200 to 3,050 meter. They inhabit mainly in forests and is frequently found near cliffs. They live in the recesses of thickly wooded gorges whose boulder strewn slopes and shallow caves give shelter from the weather. They are exceedingly active animal, not only on rocks but also on flat ground. Their call is a whistling scream. Serow is a herbivores animal, they feed on grasses, herbs, and the leaves, shoots, and twigs of trees and shrubs, during the early morning and late evening.

Ecology

During the heat of the day, the Serow takes shelter among the rocks, in caves, under overhanging rocks or cliffs, or in dense underbrush. They are good climbers, and they clambering easily along well-defined trails on mountain slopes. They are solitary creatures, sometime found in small groups or in pairs. A single pair will often stay together for multiple years. They mark their territories by rubbing a secretion from their preorbital glands on rocks. They also marked their territories with trails, dung heaps, and scents.

Social Organization and Behavior

The breeding season occurs between the months of October and November. The age of sexual maturity is between 2 to 3 years.

The gestation period is between 205 to 230 days. They usually gives birth to 1 offspring. The average lifespan of Serow is between 10 to 20 years.

Threats

Habitat Fragmentation & Land Use Change

Development of agriculture area, high dependence of local people in Serow habitat for fuel wood, timber, increasing hotels, trekking routs, increasing of settlements area and increasing distance of forest has played a critical role for habitat fragmentation which has brought critical change in the wildlife profile of the study area in the long run. These habitat fragmentations have negative impacts on the continued survival of the Serow and other different wildlife species in the area. In the Ghandruk and Landruk site, village, hotel and other infrastructure development are the main causes of isolating the forest area in the upper site which plays a role in disconnecting the corridor for serow and other wildlife movement in Landruk region.

Decline of Serow Population Conflict between Predator and Villagers

The loss of a large population of the Serow and other ungulates from the study area has created the consequent changes in the abundance of predators species like clouded leopards, common leopard, Brown bear and Black bear. Generally, such predators attack the local livestock only when their natural prey are either depleted or hard to find, so it is one indicator of the decline of the population of serow and other ungulates from the study area. Due to the loss of such preys species, predators of the study area are starting to use villager livestock as feeding species causing major conflict between the villager and predators species in the study area. Within last two years 86 livestock animal have been killed by predators in the area, therefore, local people don't like the predators in their area as compare with



ungulates and poachers mostly prefer poaching predators species such as clouded leopards, bears of the study area rather than the Serow.

Livestock Grazing in Serow habitat

Owing to high seasonality and low primary productivity, the Himalayan region supports a relatively low ungulate / herbivore biomass (Aryal, 2005). It is therefore obvious that with the increase in the biomass of domestic livestock in many areas, wild ungulates such as Serow have suffered competitive exclusion. Most of the study area has livestock grazing pressure in the Himalayan and Deurali area where less impact by livestock grazing, only 2% of livestock dung were found in those areas. Others areas have approximately equally influence by the livestock grazing. So it seems that resource competition between serow and livestock high in the area which is another major threat to the serow population.

Poaching of Serow

Serow poaching is another main threat in the study area. Generally poachers prefer not to hunt serow- they only use this species if they cannot find others species because serow meat is not taste compared with other ungulates. As a result hunting is limited and secretive. We found many snares in study area especially in the bamboo and deurali-rich sites where there is a high population of serow.

Conservation

Although there is no specific programme in ACAP to conserve serow species in their natural habitat, ACAP has established a Conservation Area Management committee in Landruk and Ghandruk area for conservation of natural resources. CAMC is directly responsible for monitoring the wildlife of their area, although they have no technical manpower. CAMC is patrolling in their forest regularly. Patrolling activities are facilitated by ACAP authorities; they provide some annual expenses to CAMC. Ghandruk and Landruk areas are populated by the Gurung people, most of whom are Buddhists. We should take this as a pin point to conservation of not only Serow but also other wildlife of the area. Poaching and hunting activities are another threat in the area which is led by local or external people, especially porters. Without the support or involvement of local people, external people cannot poach the area so awareness rising among local people is necessary as well as identifying alternative income generating as poverty is the main reason why local people hunt wildlife for their subsistence. But some higher economic status people also hunt serow as a form of recreation.

Conservation Education Activities Posters

Publication and Distribution Posters with the title of „Save the Himalayan Serow“ should be published under the project . Poster on Himalayan Serow has to be published in size of 19*21 sq. inch. Total 1000+500 posters. Posters should be able to extend knowledge about Serow and its threats in local people. In fact, there was not any information on this species and this project able to initiate to follow information about this species, so in future researchers, students will start work in further research work on this species. Further more than 600 pieces of posters were distributed in Government of India, Department of National Park and Wildlife Conservation, J & K.

Conservation Awareness should be organized for public.

Art and Essay Competition should be organized on Himalayan Serow Art and Essay competition was carried out in Himalayan Secondary School.

Conservation plan for Indian Leopard (*Panthera pardus*)



Indian leopard (*Panthera pardus fusca*) is a leopard subspecies widely distributed on the Indian subcontinent. The species Panthera pardus is listed as Vulnerable on the IUCN Red List because populations have declined following habitat loss and fragmentation, poaching for the illegal trade of skins and body parts, and persecution due to conflict situations. The Indian leopard is one of the five big cats found in India, apart from the Asiatic lion, the Bengal tiger, the snow leopard and the clouded leopard. In 2014, a national census of leopards around tiger habitats was carried out in India except the northeast. 7,910 individuals were estimated in surveyed areas and a national total of 12,000-14,000 speculated.

Classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Mammalia
Order:	Carnivora
Family:	Felidae
Genus:	Panthera
Species:	<i>Panthera pardus</i>



IUCN: Others (VU) ver 3.1.

IWPA: Schedule I

CITES listing: Appendix I

Local names: Leopard

Life span: 12-17 Years

Gestation: 90-105 days

Height: 60-70 cm (M), 57-64 cm (F)

Weight: 90-98 Kg (M), 80-86 Kg (F)

Native: Native to the Indian Subcontinent. It is widespread in India, Nepal, Bangladesh and Bhutan.

Geographical Distribution & Habitat

On the Indian subcontinent, topographical barriers to the dispersal of this subspecies are the Indus River in the west, and the Himalayas in the north. In the east, the Ganges Delta and the lower course of the Brahmaputra River form natural barriers to the range of the Indochinese leopard. Indian leopard is distributed all over India, in Nepal, Bhutan and parts of Pakistan. Bangladesh has no viable leopard population but there are occasional sightings in the forests of Sylhet, Chittagong Hill Tracts and Cox's Bazar. Indian leopard inhabits tropical rain forests, dry deciduous forests, temperate forests and northern coniferous forests but does not occur in the mangrove forests of the Sundarbans. In the Himalayas it is sympatric with the snow leopard up to 5,200 m (17,100 ft) above sea level.

Ecology and Behavior

Leopards are elusive, solitary, and largely nocturnal. They are known for their ability in climbing, and have been observed resting on tree branches during the day, dragging their kills up trees and hanging them there, and descending from trees headfirst. They are powerful swimmers, although are not as disposed to swimming as some other big cats, such as the tiger. They are very agile, and can run at over 58 kilometres per hour (36 mph), leap over 6 m (20 ft) horizontally, and jump up to 3 m (9.8 ft) vertically. They produce a number of vocalizations, including grunts, roars, growls, meows, and purrs.

Indian leopards are not common in habitat where tiger density is high, and are wedged between prime tiger habitat on the one side, and cultivated village land on the other. Where the tiger population



increases, tigers drive leopards off to areas located closer to human settlements. In the Gir National Park, they are sympatric with Asiatic lions. Elsewhere on the Indian subcontinent, they co-occur with Asian black bears, sloth bears, Indian wolves, striped hyenas and wild dogs. Leopards are versatile, opportunistic hunters, and have a very broad diet. The diet of Indian leopards include Axis deer, Sambar deer, Nilgai, wild pig, common Langur, hare and Peafowl.

Although they are smaller than most other members of the genus *Panthera*, they are able to take large prey due to their massive skulls and powerful jaw muscles.

Depending on the region, leopards may mate all year round. The estrous cycle lasts about 46 days and the female usually is in heat for 6–7 days. Gestation lasts for 90 to 105 days. Cubs are usually born in a litter of 2–4 cubs. Mortality of cubs is estimated at 41–50% during the first year. Females give birth in a cave, crevice among boulders, hollow tree, or thicket to make a den. Cubs are born with closed eyes, which open four to nine days after birth. The fur of the young tends to be longer and thicker than that of adults. Their pelage is also more gray in colour with less defined spots. Around three months of age, the young begin to follow the mother on hunts. At one year of age, leopard young can probably fend for themselves, but remain with the mother for 18–24 months. The average typical life span of a leopard is between 12 and 17 years.

Social Organization and Behavior

The leopard is solitary and territorial, as are several other felids; individuals associate appreciably only in the mating season, though mothers may continue to interact with their offspring even after weaning. Mothers have been observed sharing kills with their offspring when they cannot obtain any meal. Aggressive encounters are rare, typically limited to defending territories from intruders.

Males occupy territories that often overlap with a few smaller female territories, probably as a strategy to enhance access to females. Female live with their cubs in territories that overlap extensively – probably due to the association between mothers and their offspring. There may be a few other fluctuating territories, belonging to young individuals. It is not clear if male territories tend to overlap among themselves as much as those of females do. Individuals will try to drive away intruders of the same sex.

Reproduction

Depending on the region, leopards may mate all year round. The estrous cycle lasts about 46 days and the female usually is in heat for 6–7 days. Gestation lasts for 90 to 105 days. Cubs are usually born in a litter of 2–4 cubs. Mortality of cubs is estimated at 41–50% during the first year. Females give birth in a cave, crevice among boulders, hollow tree, or thicket to make a den. Cubs are born with closed eyes, which open four to nine days after birth. The fur of the young tends to be longer and thicker than that of adults. Their pelage is also more gray in colour with less defined spots. Around three months of age, the young begin to follow the mother on hunts. At one year of age, leopard young can probably fend for themselves, but remain with the mother for 18–24 months. The average typical life span of a leopard is between 12 and 17 years.

Threats

Hunting of Indian leopards for the illegal wildlife trade is the biggest threat to their survival. They are also threatened by loss of habitat and fragmentation of formerly connected populations, and various levels of human–leopard conflict in human–dominated landscapes.

Poaching

A significant immediate threat to wild leopard populations is the illegal trade in poached skins and body parts between India, Nepal and China. The governments of these countries have failed to implement adequate enforcement response, and wildlife crime remained a low priority in terms of political



commitment and investment for years. There are well-organised gangs of professional poachers, who move from place to place and set up camp in vulnerable areas. Skins are rough-cured in the field and handed over to dealers, who send them for further treatment to Indian tanning centres. Buyers choose the skins from dealers or tanneries and smuggle them through a complex interlinking network to markets outside India, mainly in China.

In May 2010, the Wildlife Protection Society of India estimated that in India at least 3,189 leopards were killed since 1994. For every tiger skin, there are at least seven leopard skins in the haul.

Human-leopard conflict

Expansion of agriculturally used land, encroachment of humans and their livestock into protected areas are main factors contributing to habitat loss and decrease of wild prey. As a result, leopards approach human settlements, where they are tempted to prey on dogs, pigs and goats — domestic livestock, which constitutes an important part of their diet, if they live on the periphery of human habitations. Human-leopard conflict situations ensue, and have increased in recent years. In retaliation for attacks on livestock, leopards are shot, poisoned and trapped in snares. The leopards are considered to be unwanted trespassers by villagers. Conservationists criticize these actions, claiming that people are encroaching on the leopard's native habitat. India's Forest Department is entitled to set up traps only in cases of a leopard having attacked humans. If only the presence of a crowd of people prevents the leopard from escaping, then the crowd has to be dispersed and the animal allowed to escape.

As urban areas expanded, the natural habitats of leopards shrunk resulting in leopards venturing into urbanized areas due to easy access of domestic food sources. Karnataka has a high number of such conflicts.

Conservation Strategies:

Panthera pardus is listed in CITES Appendix I. Despite India and Nepal being contracting parties to CITES, national legislation of both countries does not incorporate and address the spirit and concerns of CITES. Trained human resources, basic facilities and effective networks for control of poaching and trade in wildlife are lacking. In India for conservation of Leopard it is kept under schedule-I of the Wildlife act-1972.

Conservation plan for Leopard Cat (*Prionailurus bengalensis*)

The leopard cat (*Prionailurus bengalensis*) is a small wild cat native to South, Southeast and East Asia. The ancestry of the Bengal cat derives from a spotted domestic cat and a small wild spotted feline called the Asian leopard cat or *Felis bengalensis*. Since 2002 it has been assessed as Least Concern on the IUCN Red List as it is widely distributed but threatened by habitat loss and hunting in parts of its range. Leopard cat subspecies differ widely in fur colour, tail length, skull shape and size of carnassials.

Classification:

Kingdom:	Animalia
Phylum:	Chordata
Class:	Mammalia
Order:	Carnivora
Family:	Felidae
Genus:	<i>Prionailurus</i>
Species:	<i>Prionailurus bengalensis</i>



IUCN: LC ver 3.1.

IWPA: Schedule I.



CITES: Appendices I.



Local names: Leopard Cat

Life span: 4 Years (Avg.)

Gestation: 65-72 days

Length: 45-107 cm

Weight: 3-7 Kg

Native: South-east and East Asia

Geographical Distribution & Habitat

Leopard cats have different subspecies that are indigenous to a large part of southern Asia. They can be found in agriculturally used areas, deep jungles and forested habitats from southern India eastward through Bangladesh, Burma, Thailand, Malaysia, China, Korea and into Russia's Far East. It can also be found on southern islands such as Sumatra, Borneo, Bali, Java, Taiwan, the Philippines and the Sunda islands of Indonesia.

Colors and markings

- Head: Four vertical black stripes run from the forehead or inner eye corners to the back of the neck, breaking up into short irregular rows of dark markings and elongated spots on the neck and shoulders, although sometimes one stripe runs the length of the entire body. Two narrow black cheek stripes run from the outer eye corners, enclosing a white area on the cheek. The back of their ears are black with the exception of a white triangular shaped spot.
- Coat: It's primarily the spotted coat that suggests "leopard". ALCs exhibit well-defined dark spots spread all over their body that can be solid or rosetted and sometimes marbled. The base coat varies in color depending on the cat's geological areas of origin, and ranges from different shades of tan (beige to golden), gray or tawny brown. The chin, throat, belly, and interior parts of the legs are white with black spots.
- Pads: The color of their toe pads varies from dark purple to dark brown. The carpal pads, found on the forelegs, are very light pink.
- Tail: All asian leopard cats have a spotted or ringed tail whose tip is black.

Ecology & Behaviour:

Leopard cats are solitary, except during breeding season. Some are active during the day, but most hunt at night, preferring to stalk murids, tree shrews and hares. They are agile climbers and quite arboreal in their habits. They rest in trees, but also hide in dense thorny undergrowth on the ground. In the oil palm plantations of Sabah, they have been observed up to 4 m (13 ft) above ground hunting rodents and beetles. In this habitat, males had larger home ranges than females, averaging 3.5 km² (1.4 sq mi) and 2.1 km² (0.81 sq mi) respectively. Each male's range overlapped one or more female ranges. There is evidence to suggest that rats are abundant and may be easy to catch in oil palm plantations. There, leopard cats feed on a large proportion of rats compared to forested areas.

Leopard cats can swim, but seldom do so. They produce a similar range of vocalisations to the domestic cat. Both sexes scent mark their territory by spraying urine, leaving faeces in exposed locations, head rubbing, and scratching.



Diet

Leopard cats are carnivorous, feeding on a variety of small prey including mammals, lizards, amphibians, birds, insects, rodents, reptiles, fish and insects in the wild. In most parts of their range, small rodents such as rats and mice form the major part of their diet, which is often supplemented with grass, eggs, poultry, and aquatic prey. They are active hunters, dispatching their prey with a rapid pounce and bite. Unlike many other small cats, they do not "play" with their food, maintaining a tight grip with their claws until the animal is dead. This may be related to the relatively high proportion of birds in their diet, which are more likely to escape when released than are rodents.

Reproduction

The breeding season of leopard cats varies depending on climate. In tropical habitats, kittens are born throughout the year. In colder habitats farther north, females give birth in spring. Their gestation period lasts 60–70 days. Litter size varies between two and three kittens. Captive born kittens weighed 75 to 130 grams at birth and opened their eyes by latest 15 days of age. Within two weeks, they doubled their weight and were four times their birth weight at the age of five weeks. At the age of four weeks, their permanent canines break through, and they begin to eat meat. Captive females reach sexual maturity earliest at the age of one year and have their first litter at the age of 13 to 14 months. Captive leopard cats have lived for up to thirteen years. The estrus period lasts 5–9 days.

Threats

In China, leopard cats are hunted mainly for their fur. Between 1984 and 1989, about 200,000 skins were exported yearly. A survey carried out in 1989 among major fur traders revealed more than 800,000 skins on stock. Since the European Union imposed an import ban in 1988, Japan has become the main buyer, and imported 50,000 skins in 1989. Although commercial trade is much reduced, the species continues to be hunted throughout most of its range for fur, for food, and as pets. They are also widely viewed as poultry pests and killed in retribution.

In Myanmar, 483 body parts of at least 443 individuals were observed in four markets surveyed between 1991 and 2006. Numbers were significantly larger than non-threatened species. Three of the surveyed markets are situated on international borders with China and Thailand, and cater to international buyers, although the leopard cat is completely protected under Myanmar's national legislation. Implementation and enforcement of CITES is considered inadequate.

Conservation plan for Himalayan Boar Bear (*Ursus arctos isabellinus*)

The Himalayan brown bear (*Ursus arctos isabellinus*), also known as the Himalayan red bear, Isabelline bear or Dzu-Teh, is a subspecies of the brown bear and is known from northern Afghanistan, northern Pakistan, northern India, Nepal and Tibet. It is the largest mammal in the region, males reaching up to 2.2 m (7 ft) long while females are a little smaller. These bears are omnivorous and hibernate in a den during the winter. Although present in a number of protected areas, they are becoming increasingly rare because of loss of suitable habitat and persecution by humans, and have become "critically endangered". This bear (as the Dzu-Teh) is thought to be the source of the legend of the Yeti.



Classification:

Kingdom:	Animalia
Phylum:	Chordata
Class:	Mammalia
Order:	Carnivora
Family:	Ursidae
Genus:	<i>Ursus</i>
Species:	<i>Ursus isabellinus</i>



IUCN: CR ver 3.1.

IWPA: Schedule I.

CITES: Appendices I.

Local names: Himalayan brown bear

Life span: 20-30 Yrs

Gestation: 180- 266 days

Length: 1-3 m

Weight: 80-600 Kg

Geographical Distribution & Habitat

The bears are found in Nepal, Tibet, north India, and north Pakistan. They are already speculated to have become extinct in Bhutan.

Description

Himalayan brown bears exhibit sexual dimorphism. Males range from 1.5m up to 2.2m (5 ft - 7 ft 3in) long, while females are 1.37m to 1.83m (4 ft 6 in - 6 ft) long. They are the largest animals in the Himalayas and are usually sandy or reddish-brown in colour.

Physical Description

One of the largest of living carnivores, grizzly bears are 1 to 2.8 meters in length from head to rump and their tails are 65 to 210 mm long. They are 90 to 150 cm tall at the shoulder and can tower at an intimidating height of 8 feet when standing upright on their hind legs. They range in weight from 80 to more than 600 kg. On average, adult males are 8 to 10% larger than females. *Ursus arctos* is largest along the coast of southern Alaska and on nearby islands where males average 389 kg and females average 207 kg, though some males have been weighed at as much as 780 kg. Distance between the canines is from 6 to 8 cm. Size rapidly declines to the north and east, with individuals in southwestern Yukon weighing only 140 kg on average. Fur is usually dark brown, but varies from cream to almost black. Individuals in the Rocky Mountains have long hairs along the shoulders and back which are frosted with white, giving a grizzled appearance, hence the common name grizzly bear in that region. Brown bears are extremely strong and have good endurance; they can kill a cow with one blow, outrun a horse, outswim an Olympian, and drag a dead elk uphill.

Communication and Perception

Brown bears communicate primarily through smells and sounds. Brown bears can be heard making moaning noises sometimes while they are foraging. They scratch and rub on trees and other landmarks to communicate territorial boundaries and reproductive status.

Brown bears have an excellent sense of smell (able to follow the scent of a rotting carcass for more than two miles), human-level hearing, but relatively poor eyesight.



Ecology & Behaviour:

The bears go into hibernation around October and emerge during April and May. Hibernation usually occurs in a den or cave made by the bear.

Food Habits

Brown bears are omnivorous, eating almost anything nutritious. Their diet changes with seasonal availability of different food sources. They eat a wide variety of plant foods, including grasses, sedges, roots, moss, and bulbs. Fruits, nuts, berries, bulbs, and tubers are taken extensively during summer and early autumn. They consume insects, fungi, and roots at all times of the year and also dig mice, ground squirrels, marmots, and other fossorial animals out of their burrows. Moth larvae have been demonstrated to be especially important sources of protein and fat when brown bears are putting on fat in the fall. In the Canadian Rockies and other areas, grizzly bears (the subspecies of brown bear in that area) are quite carnivorous, hunting moose, elk, mountain sheep, and mountain goats. Occasionally black bears are preyed upon. In Alaska, brown bears have been observed to eat carrion and occasionally capture young calves of caribou and moose. Brown bears have also been observed to feed on vulnerable populations of breeding salmon in the summer in these areas.

Reproduction

Female brown bears copulate with multiple males during estrus, which lasts 10 to 30 days. Males may fight over females and guard them for 1 to 3 weeks. Female receptivity is probably communicated by scent marking throughout her territory.

Conservation Status

Their conservation status depends on the population. Some populations are clearly endangered, others are not. Brown bear numbers have dropped dramatically since the turn of the century, when settlers and livestock flooded the West, driving these bears out of much of their former range. Brown bears now cling to a mere 2 per cent of their former range. Logging, mining, road construction, resorts, subdivisions, golf courses, etc. have all encroached on suitable bear habitat, resulting in a decrease in bear numbers. Brown bear numbers were estimated at 100,000 in the conterminous United States in the early 1900's, but there are now fewer than 1,000. Brown bears are still fairly common in the mountainous regions of western Canada and Alaska, perhaps numbering about 30,000 individuals.

7.6 Conclusion

The conservation plan suggested here is for scheduled fauna will be implemented by the mining lease holder. It is very important to conserve the scheduled fauna in the area by the local authority as well as by the forest officials. People are not aware about the wildlife and protection of wild animals. There is an urgent need of education and awareness to local people about the wild life and their importance.

Some of the conservation measures are as follows:

Education and Awareness: This is the most important aspect of wild life conservation. People will be educated regarding the importance of wild life conservation through mass publicity by installing sign-boards, conducting audio visual classes and distributing literature in respective villages in the buffer zone. Experts in the field of wild life conservation will also be invited to deliver talks through slides.

People Participation: With the help of the local people and employees of the Company watch will be kept on the wildlife as well as illegal tree felling in forest areas. Forest and police department will be



informed if such incident occurs, to take legal action against the offenders. For this they will be trained for motivation.

The people living in the surrounding area and employee of the company would be motivated towards the protection of the animal. Motivation will lead to timely information to the concerned authorities about any threat to wild life or any cases of poaching/hunting.

Special Staff for the Protection and Anti-poaching: Special Staffs will be deployed by the forest department for patrolling and protection of the fauna and flora under their jurisdiction because the regular staff deployed for this purpose, due to their busy schedule, is unable to perform their work properly. Each of the special staff will be equipped with dress, raincoat, gumboots, sticks and wireless set for communication. Financial burden for the same has been included in financial projection of this report.

Reducing man wildlife conflicts: Unauthorized entry in to forest for illegal grazing, cutting or poaching are the major causes for Man-Wildlife conflicts. These practices will be reduced as much as possible.

Training and Awareness Programme: This is the most important aspect of wild life conservation. People will be educated regarding the importance of wild life conservation through mass publicity by installing sign-boards, conducting audio visual classes and distributing literature in respective villages in the buffer zone. Experts in the field of wild life conservation will also be invited to deliver talks through slides.

7.7 SOCIO ECONOMIC IMPACT OF THE PROJECT AND SAFETY MEASURES

Socio Economic Impact Assessment (SEIA) refers to systematic analysis of various social and economic characteristics of human being living in a given geographical area during a given period. SEIA is carried out separately but concurrently with Environment Impact Assessment (EIA). It focuses the effect of the project on social and economic well being of the community.

7.7.1 Impact on Demographic Composition

The villages and their inhabitants in the buffer zone will not be disturbed from their settlements due to the mining operations. There is no inhabitation within the lease area. Therefore neither villages nor any part of village or any hamlet will be disturbed during the entire life of the mine. As the mining operations will not disturb or relocate any village or settlement, no adverse impact is anticipated on any human settlement. The mining operation does not disturb/relocate any village.

7.7.2 Employment Opportunities

As per the survey it has been observed that the population in general do not have opportunities of earning from employment and the non worker population is higher in the region so the mining operations in general will help to provide direct and indirect job opportunities for auxiliary and ancillary works etc In the absence of any high employment potential activities due to low literacy level, the people are economically backward. The mining operations will provide employment to 39 people that may help to improve the quality of life of the people in the study area.

7.7.3 Increased Supply of Stone in the Market

With the commencement of the proposed mining project the supply of stone will increase and the gap between demand and supply will decrease to some extent, if not fully.



7.7.4 Impact on Agriculture

The agricultural activities are seen in the areas where there is sufficient soil cover. The buffer zone will remain undisturbed and no adverse impact is envisaged.

Mining activity also adds to the water pollution problems in the rivers, especially in the urbanized areas. It is sure that all these activities ultimately end up in the degradation of the rivers. Productivity of crops may be deteriorated affecting the agriculture based livelihood due to the pollution arising out of the mines, if proper mitigation measures are not implemented.

7.7.5 Improvement in Infrastructure

Continued mining activities will benefit the local people due to provision of more infrastructural facilities (developments of approach routes within the village area, street light, health facilities etc.)

7.7.6 Impact on Health

There are no chances of occurring diseases, due to mechanized mining of stone. Stone is non-toxic. However, activities such as drilling, blasting require precautions since it create respiratory problems among mine workers. Excessive inhalation of fugitive dust is a serious health concern. To avoid respiratory problem from stone necessary protection will be taken.

7.8 REHABILITATION AND RESETTLEMENT (R & R)

There is no displacement of the population within the project area and adjacent nearby area and the complete lease area is Govt. land. However Social development of village will be considered as per social activities. Provision and maintenance of protective works like drains, parapet walls, retaining walls, check dams, Management of Air and water quality, Management of Waste, top soil, infrastructure and mining machinery disposal, Safety and security. The resources required for management of these operations will be supervision, raw materials (mainly stone available at mines), gates, fencing, transport and Communication. All the above operations will be carried out in three months time.

7.9 CORPORATE SOCIAL RESPONSIBILITY

Proposed CSR Activities - Apart from the various environmental protection measures, the project proponent is conscious of its social responsibility and as any good corporate citizen, it is proposed to undertake the following works in the surrounding areas of the mine.

- Community Health Improvement activities such as periodically medical checkup camps, blood donation camps and health awareness camps for child and mother care, health and hygiene practices shall be implemented
- Disinfection of dug wells and other potable water sources and awareness camps shall be organized on water borne diseases, health and hygiene etc.
- Improvement in community educational activities will cover the distribution of educational books, stationary and aids and other infrastructure facilities etc.
- Decrease water scarcity problem at a possible extent during scarcity period through conducting water conservation programs and by built up rain water harvesting pits
- Afforestation programs will involve the activities such as greenbelt development, plantation of trees in villages' road side and development of nursery for maintaining the greenery of the area & preventing pollution.



Therefore, the proposed mining project can be considered “significantly positive” i.e. keep regular watch on adverse impacts through practicing pollution control measures and post monitoring with simultaneous contribution towards raising standard of living of the people in study area together with its development. Shri Mushtaq Muzafar Anim proposed to incur approx. Rs. 16.00 Lakhs per annum towards Corporate Social Responsibility given below in Table 7.16. The major activities provided in below Table 7.15:

Table 7.8: Need Specific Proposed CSR Activities

No.	Planned Activities under CSR as per specific needs
1.	Community Education Facilities <ul style="list-style-type: none"> Augmentation of furniture, blackboard, etc in village schools Award scholarship to meritorious students Distribution of educational books, stationary, uniforms and aids etc.
2.	Community Health Improvement <ul style="list-style-type: none"> Disinfection facilities for dug wells and other potable water sources. Periodically medical checkup camps, blood donation camps. Eye checkup camps Health awareness camps for child and mother care, health and hygiene practices.
3.	Community Welfare Activities <ul style="list-style-type: none"> Worship places development & beautification Distribution of seeds & saplings Promotion & support to various Govt. Schemes.
4.	Infrastructural Development <ul style="list-style-type: none"> Installation/ Repair of Hand Pumps/ Bore wells Grampanchayat dug-well de-siltation and deepening Construction and maintenance of village roads adjacent to project site
5.	Community Water Conservation <ul style="list-style-type: none"> Rain water harvesting ponds and ground water recharge pits Water conservation awareness programs
6.	Afforestation Programs <ul style="list-style-type: none"> Plantation of trees in villages road side Development of nursery
7.	Community Capacity Building <ul style="list-style-type: none"> Imparting vocational training for technical skills, self employment training for women as stitching, embroidery, tailoring, handicrafts

Table 7.9: Budget for Corporate Social Responsibility

S. No.	Components	Cost (Lakhs/ Annum)
1.	Health Facility <ul style="list-style-type: none"> Medical Checkup Camps at Chakdura Village. Supply of medicine on subsidized rate at Khrew Village. Blood donation and Eye-checkup camps in Chakdura Village. Health Awareness Camps at Chakdura, Bathyn and Khrew Villages. 	4.00



2.	Education Facility <ul style="list-style-type: none"> • Provision of Stationary to Primary School Chakdura Village. • Uniform to Poor Students of Bathyn Village. • Sanitary Provision and Drinking Water Facility at Khrew Village. 	3.00
3.	Infrastructural Development <ul style="list-style-type: none"> • Installation of submersible Pump at Chakdura Village. • Haul Road maintance connecting to Bathyn Village. • Providing Street Lights at Khrew Village. 	5.00
4.	Community Water Conservation <ul style="list-style-type: none"> • Social Forestry at Chakdura, Bathyn, Khrew Villages. • Awareness Camp about Water Conservation at Chakdura, Bathyn, Khrew Villages. 	4.00
TOTAL (Lakhs)		16.00

It is expected that this will improve the socio-economic status of the people and at the same time the popularity of the project proponent will enhance. The local community in the study area desired that the project proponent should take up the following development initiatives for the betterment of the local people.

- a) Health camps in project village
- b) Distribution of books and stationeries to meritorious students in the study area
- c) One time donation to the schools for drinking water facilities
- d) Training camps for skill development

For each activity the funds to be earmarked by the proponent will be decided after discussion with the local authority and the beneficiaries. It has been planned to undertake a concurrent evaluation of the activities to be taken up under the CSR program.

7.10 SUMMARY

The Final EIA/EMP will include all the public issues after conducting the public hearing. Risk assessments will help mine operators to identify high, medium and low risk levels. This is a requirement of the Occupational Health and Safety Act 2000. Risk assessments will help to priorities the risks and provide information on the need to safely control the risks. In this way, mine owners and operators will be able to implement safety improvements. Mining and allied activities are associated with several potential hazards to both the employees and the public at large. A worker in a mine will be able to work under conditions, which are adequately safe and healthy. At the same time the environmental conditions also will not impair his working efficiency. This is possible only when there is adequate safety in mines. Hence mine safety is one of the most essential aspects of any working mine. This mining project has positive impact on social and economic well being of the community because this project provides employment opportunities to local people and many social welfare works done by project proponent. No displacement is involved for the proposed project. Hence, R&R plan is not applicable for the project. A budget of Rs.16.00 Lakhs for Corporate Social Responsibility, budget of Rs. 20.00 Lakhs for Occupational Health and Safety in which budget of Rs. 2.25 Lakhs for Measures to Prevent Accidents during mining, budget of Rs. 6.00 Lakhs for Medical Examination Schdule and budget of Rs. 32 Lakhs for EMP are incurred by Project Proponent.



CHAPTER-8

PROJECT BENEFITS

8.0 GENERAL

The execution of the project bring overall improvement in the locality, neighborhood and the State by bringing industry, roads, employment and hence improving living standard and economic growth.

8.1 PHYSICAL BENEFITS

The opening of the proposed project will enhance the following physical infrastructure facilities in the adjoining areas:

- a. **Road Transport:** There will be improved road communication due to the proposed project and maintenance will also be done time to time.
- b. **Market:** Generating useful economic resource for construction. Excavated mineral will provide a good market opportunity.
- c. **Infrastructure:** Creation of community assets (infrastructure) like provision for drinking water, construction of school buildings, village roads/ linked roads, dispensary and health centre, community centre, market place etc, as a part of corporate social responsibility.
- d. **Enhancement of Green Cover:** As a part of reclamation plan, plantation will be carried along the road sides or near the civic amenities.
- e. **Green Belt Development:** A suitable combination of trees that can grow fast and also have good leaf cover will be adopted to develop the green belt. It is proposed to plant 1000 No's per annum of native species along with some fruit bearing and medicinal trees during the mining plan period.
- f. **Local Employment:** This project will enhance the opportunities of employment for the local villagers near the lease area due to which their economic status become better.

8.2 SOCIAL BENEFITS

The mining in the area will create rural employment. It has been observed that conditions of the villages around mining areas are better than that of distant villages. The mining activity in the region will have positive impact on the social economic condition of the area by way of providing employment to the local inhabitants; wages paid to them will increase the per capita income, housing, education, medical and transportation facilities, economic status, health and agriculture.

A detailed program for socio economic development of the area has been framed. The salient features of the programme are as follows:

- i) Social welfare program like provision of medical facilities educational facilities, water supply for the employees as well as for nearby villagers will be taken.
- ii) A well laid plan for employment of the local people has been prepared by giving priority to local people.
- iii) Supplementing Govt. efforts in health monitoring camps, social welfare and various awareness programs among the rural population.
- iv) Assisting social forestry program.
- v) Adoption of villages for general development.
- vi) Supply of water to village nearby villages.
- vii) Development of facilities within villages like roads, etc.

8.2.1 Environmental and Social Responsibility

The project proponent is conscious of its social responsibility and as any good corporate citizen; it is proposed to undertake the need specific proposed CSR activities in the surrounding areas of the mine. The mining operations will provide employment to **39 people**. The project proponent has proposed to incur budget of **Rs. 16.00 Lakhs** for CSR activities and discussed in chapter 7.



8.3 ECOLOGICAL BENEFITS

A green belt will be developed along the roads, barren area, surrounding office, rest shelter and other social forestry programme. The area for green belt plantation consists of hilly terrain; hence plantation could be made as in road side plantation. Green belt is erected not from biodiversity conservation point of view but is basically developed as a screen to check the spread of dust pollution. It is proposed to plant **1000 Nos.** of native species along with some medicinal trees during the plan period and a budget of **Rs. 10.00 Lakhs** per year for both project plantation is given in EMP. Green belt plantation will be started with the beginning of the mining and will be completed within five years from the beginning.

8.4 SUMMARY

The management will recruit the semi-skilled and unskilled workers from the nearby villages. The project activity and the management will definitely support the local Panchayat and provide other form of assistance for the development of public amenities in this region. The company management will contribute to the local schools, dispensaries for the welfare of the villagers. A suitable combination of trees that can grow fast and also have good leaf cover will be adopted to develop the green belt. It is proposed to plant 1000 Nos. per annum no's of native species along with medicinal trees during the mining plan period. The project proponent has allocated **Rs. 16.00 Lakhs** per annum for CSR Activities.



CHAPTER-9

ENVIRONMENTAL COST BENEFIT ANALYSIS

9.0 PROJECT COST

After making exhaustive study, it is considered desirable that the mining project may be implemented. Project cost for the proposed minor mineral of "Lime Stone Mine" over an area of 21.106 ha. falling in Village- Chakdura, Bathyn and Khrew, Tehsil -Pampore , District- Pulwama (Jammu and Kashmir) is **Rs. 8.00** Crores.

Table 9.1 Project Cost and Benefit

Major Heads	Value
Production Capacity	53055 TPA
Production Cost of Mineral	Rs 310 Per Ton
Sale Value of Mineral	Rs 510 Per Ton
Profit	Rs. 200 per Ton
Estimated Profit per Annum	Rs. 1.00 crore Per Annum

9.1 ENVIRONMENT COST ANALYSIS

The detailed cost for Environmental Expenses is given below in the Table.

Table 9.2 Environmental Cost Analysis

S.No	Major Heads	Budget (Rs. in Lakhs/Annum)
1.	Environmental Management Plan	32.00
2.	Environmental and Social Responsibility	16.00
3.	Occupational Health and Safety	20.00
	Total	68.00

The estimated capital cost and financial viability of the present scheme has been worked out on the assumption that the above scheme shall be completed by the end of Year, 2029 *i.e.* end of lease period. From the above financial analysis it is clear that this stone mining project is financial and technically viable. The estimated profit will be 1,00,00,000-68,00,000 =32,00,000 per annum for Chakdura Limestone Mining.



CHAPTER-10

ENVIRONMENTAL MANAGEMENT PLAN

10.0 INTRODUCTION

The mine development in the ML area needs to be intertwined with judicious utilization of natural resources within the limits of permissible assimilative capacity. The assimilative capacity of the study area is the maximum amount of pollution load that can be discharged in the environment without affecting the designated use and is governed by dilution, dispersion and removal due to natural physicochemical and biological processes.

The environmental management must be integrated into the process of mine planning so that ecological balance of the area is maintained and adverse affects are minimized. An Environmental Management Plan (EMP) is a site specific plan developed to ensure that the project is implemented in an environmentally sustainable manner. An effective EMP ensures the application of best practice environment management to a project. The purpose of an EMP is to:

- i. Assists proponent in the preparation of an effective and user friendly EMP.
- ii. Improve the contribution that an EMP can make to the effectiveness of the environmental management process.
- iii. Ensure a minimum standard and consistent approach to the preparation of EMP's.
- iv. Ensure that the commitments made as part of the project's EIA are implemented throughout the project life.
- v. Ensure that environment management details is captured and documented at all stages of a project.

The design of EMP for operational phase has been aimed to achieve the following objectives:

- i. To ensure adoption of state of art technological environmental control measures and implementing them satisfactorily.
- ii. Effectiveness of mitigatory measures in mitigation of impacts.
- iii. Description of monitoring program of the surrounding environment.
- iv. Institution arrangements to monitor effectively and take suitable corrective steps for implementation of proper EMP.
- v. An Environmental Management Cell (EMC) should be set up to take care of all environment aspects and to maintain environmental quality in the project area.

The detailed hierarchy and responsibilities of Environment Management Cell is discussed in Chapter-6.

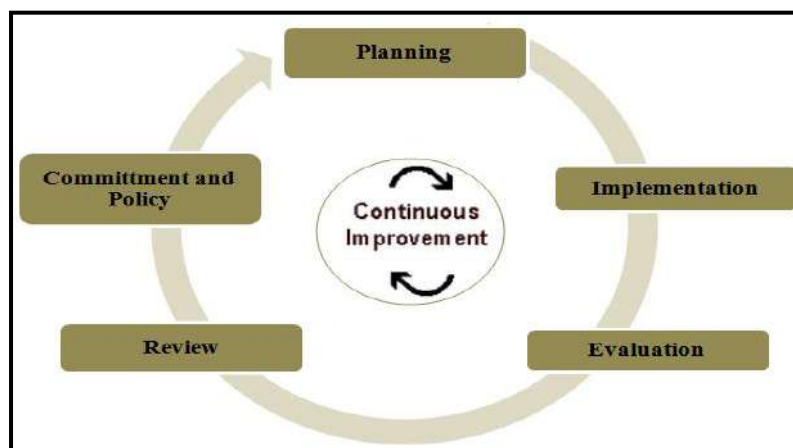


Figure10.1: Flow Chart of EMP

10.1 LAND USE PATTERN

Deviation from planned mining procedure can lead to soil erosion/cutting and thereby degradation of land, causing loss of properties and degradation surrounding of landscape. Thus for environmental friendly major mining the following control/abatement measures will be followed:



- i. Mineral will be mined out in from the proposed lease area and sufficient safety barrier should be taken during mining.
- ii. Land use plan of mine lease area should be prepared to encompass pre-operational, operational and post operation phases and submitted.

10.2 AIR ENVIRONMENT MANAGEMENT

Mitigative measures suggested for air emission control will be based on the baseline ambient air quality monitoring data. From the point of view of maintenance of an acceptable ambient air quality in the region, it is desirable that the air quality needs to be monitored on a regular basis to check it vis-à-vis the NAAQS prescribed by MoEF&CC and in cases of non-compliance, appropriate mitigative measures will be adopted. In order to minimize impacts of mining on air and to maintain it within the prescribed limits of CPCB/ SPCB, an Environmental Management Plan (EMP) has been prepared. This will help in resolving all environmental and ecological issues likely to cause due to mining in the area.

During the course of mining no toxic substances are released into the atmosphere as such there seems to be no potential threat to health of human beings. In the mining activities, the source of gaseous emissions is engines of vehicles, Operation of mining machinery/ loading operations, drilling and blasting. The reasons may be quality of fuel, improper operation of the engine, etc; proper maintenance of engines will improve combustion process and brings reduction in pollution.

10.2.1 Control of Gaseous Pollution

In mining activities, the only source of gaseous emissions is from blasting and the engines of Heavy earth moving machines (HEMM).

Blasting of explosive results in increase of nitrogen oxides, which are dispersed by the wind. Controlled blasting and optimization of use of explosive energy will help in reducing the above emissions.

The emissions from the diesel engines of the machinery can be controlled by proper maintenance and monitoring of machines.

10.2.2 Control of Dust Pollution

The main pollutant in air is PM₁₀, which is generated due to various mining activities. However to reduce the impact of dust pollution the following steps have been taken during various mining activities.

a) During drilling operations

- i. Sharp drill bits will be used for drilling and regrinding is done periodically to reduce generation of dust.
- ii. The drill machines will be kept leakage free and equipped with wet drilling arrangements.
- iii. Drill operator and his helper will be equipped with personal protective equipment (ear plugs/ear muffs).

b) During blasting operation

All essential steps will be taken to prevent any person entering in the mine site during blasting operations. The drill holes will be charged by certified blaster and in supervision of Mining Engineer/ Mines Manager. The holes will be blasted by certified blaster. Before blasting the warning siren will be blown and men and machinery will be taken out from the safety zone. During blasting all the statutory requirements as per MMR- 1961 will be strictly followed.

- i. The use of 'water ampoules' will be done to arrest dust.
- ii. Blasting will be done in controlled manner with the use of latest technology like use of millisecond delay detonators, cord relay to control and prevent the dust to get air borne and to limit the fly rocks within 50–60 m.
- iii. Overcharging of blast holes will be avoided.
- iv. Rock Breakers will be used to avoid secondary blasting.
- v. With the good blasting system, dozing of broken rocks will be less and hence dust due to dozing will be less.
- vi. Competent persons carry out blasting and all the precautions lay under MMR, 1961 Act are followed.

Time to time scientific studies regarding ground vibration, noise level, flying rocks and other blasting



hazards will be conducted through experts of the subjects.

c) During loading operation

- i) Latest loading equipment like hydraulic excavators will be used with dumpers. This reduces the number of buckets to fill from height and thus have comparatively less dust generation. The propagation of this dust is confined to loading point only and does not affect any person both the operators of excavator and dumpers who will sit in closed chamber and will be equipped with dust mask.
- ii) Skilled operators will operate excavators.
- iii) Avoid overloading of dumpers and consequent spillage on the roads.
- iv) The operator's cabin in the drills, dumpers will be provided with dust free enclosure and persons working at high dust prone areas will be provided with dust mask.

d) During Transport operation

- i) All the haulage roads including the main ramp be kept wide, leveled, compacted and properly maintained and watered regularly during the shift operation to prevent generation of dust due to movement of dumpers, and other vehicles.
- ii) Mineral carrying trucks will be effectively covered by Tarpaulin to avoid escape of fines to atmosphere.
- iii) Regular Compaction and grading of haul roads to clear accumulation of loose material.
- iv) Air quality will be regularly monitored both in the core zone and the buffer zone.

c) Plantation work carried out

In order to reduce air pollution in the surroundings, green belt will be developed around mines office, mine approach road. The plantation will be done around the lease boundary.

d) Monitoring of air pollution

Periodic air quality survey will be carried out to monitor the changes consequent upon mining activities as per the norms of Haryana State Pollution Control Board.

10.3 NOISE AND VIBRATION ENVIRONMENT

The ambient noise level monitoring carried out in and around the proposed mine lease area shows that ambient noise levels are well within the stipulated limits of MoEF&CC.

There is drilling and blasting for mineral extraction. Noise pollution due to drilling, blasting & transportation will cause some problem to the inhabitants of this area because there is human settlement in close proximity to the link roads in lease area. Effective steps will be taken to keep the noise level well below the DGMS prescribed limit of 85 dBA.

10.3.1 Noise Abatement and Control

- i. All the machineries including transport vehicles will be properly maintained to minimize generation of noise.
- ii. Silencers in the machineries will be provided to reduce generation of noise.
- iii. Drilling with sharp edges bits will minimize generation of noise.
- iv. Control blasting will be done with proper charge of explosive to minimize noise during blasting.
- v. Attenuation between source and receive points will be incased.
- vi. Dense plantation in mining area will also reduce propagation of noise outside the core zone.
- vii. Optimal blast hole geometry charge will be reused.
- viii. Rock breakers will be used instead of secondary blasting.
- ix. Blasting will be avoided under unfavorable atmospheric conditions
- x. Periodical monitoring of noise will be done to adopt corrective actions wherever needed.
- xi. Plantation will be taken up along the approach roads. The plantation minimizes propagation of noise and also arrests dust.



10.3.2 Vibration Abatement

The blasting operations in the proposed mine will be carried out by deep hole drilling and blasting using delay detonators, which reduce the ground vibrations. Further, the ground vibrations will be controlled by using shock tubes with nonelectric delay detonators. The measures that are generally followed and currently proposed for abatement of ground vibration, air blast and fly rocks are detailed below:

- i. Blasting will be performed strictly as per the guidelines specified under MMR,1961;
- ii. Proper design of blast with correct spacing, burden and optimum charge/delay;
- iii. Supervision of drilling and blasting operations to ensure blast design geometry as per planning;
- iv. Sub-drilling will be kept adequate to eliminate toe formation;
- v. Blasting operations will be carried out only during day time as per DGMS guidelines;
- vi. Proper warning signals will be used;
- vii. Adequate safe distance from habitation as per standards from centre of blasting will be maintained;
- viii. Drilling parameters like burden, depth, diameter and spacing will be properly designed to ensure proper blast;
- ix. Effective stemming of the explosives will be done in the drill holes.

10.4 WATER MANAGEMENT

There will be no wastewater generation from the mining operations. Only wastewater generation will be sanitary wastewater, which will be treated in septic tank followed by subsurface dispersion.

10.4.1 Surface Water Management

- i. As such no surface water body exists within the lease area, no adverse impacts are envisaged on the same.
- ii. Proper mitigative measures will be taken up to control the pollutants within prescribed standards and limiting the emissions to site only.
- iii. Garland drains will be provided to prevent the entry of rainwater into the mining pit.

10.4.2 Ground Water Management

- i. Mining will not intersect the ground water table of the area. So it will not disturb water environment.
- ii. Natural pits will be used for rainwater conservation and harvesting.
- iii. Rain water harvesting practices shall be done which will lead to ground water recharge.
- iv. At the end of the life of mine artificial water reservoir has been proposed in mining plan

10.4.3 Waste Water Management

No waste water is generated from the mining activity of minor minerals as the project only involves lifting/excavation of Stone and transportation directly to the consumers.

10.4.4 Water Conservation

The project do not consume any process water except for drinking, dust suppression and plantation. Plantation is proposed, which will increase the water holding capacity and help in recharging of ground water. Artificial rainwater harvesting is proposed for the present project.

10.5 SOLID WASTE AND TOP SOIL MANAGEMENT

10.5.1 Waste Management

As stated in mining method, there will be no OB/ waste generation and there will not be any OB/ waste dumps.

10.5.2 Top Soil Management

The top soil occurs in the form of patches with thickness of 0.20 m to 0.50 m. will be first removed by dozer and it will be transported to a separate top soil stack yard at the statutory barrier of 7.5 m. of the lease area. As per the year wise development plan, all the top soil that have been extracted from the mine area in first year, will be used in plantation in the second year onwards. And all the top soil that has been extracted during the second year will be stacked in the same stack yard and will be used for plantation in the third year.



10.6 GREEN BELT DEVELOPMENT

The proposed green belt in the lease area is to be developed taking into consideration the availability of area as the efficiency of green belt in pollution control mainly depends on tree species, its width, distance from pollution sources, side of the habitat from working place and tree height. The proposed green belt has been designed to control PM₁₀, gaseous pollutants, noise, surface run off and soil erosion etc. While considering the above aspects due care will be taken for selecting the suitable characteristics plant species such as fast growing, locally suitable plant species, resistant to specific pollutant and those which would maintain the regional ecological balance, soil and hydrological conditions.

10.6.1 Plan for Link Road and Haulage Road

This Limestone mining site is located in village Chakdura, (Bathyn and Khrew) district Pulwama (Jammu and Kashmir) and both are connected with the NH-1 A. Bathyn is 11.00 Km away from NH-1 A leading to village Chakdura to major district road. The distance between mine site and this link NH-1 A is approx 9 Km. A map is also enclosed showing the existing network of road and the proposed moterable road.

10.6.2 Plantation Program

Under the afforestation plan, plantation in nearby villages and connecting roads will be undertaken. The implementation for development of greenbelt will be of paramount importance as it will not only add up as an aesthetic feature but will also act as a pollution sink. The species to be grown in the areas should be dust tolerant and fast growing species so that a permanent greenbelt is created. Plantation in the barrier zone and roads is necessary as these areas will contain fine particulates resulting from mining operation and vehicle movement. Plantation will also be carried out as social forestry program in village, school and the areas allocated by the Panchayat/State authorities. Native plants like Neem, Peepal, Khejri and other local species will be planted. A suitable combination of trees that can grow fast and also have good leaf cover shall be adopted to develop the greenbelt. It is proposed to plant 1000 number of native species along with some fruit bearing and medicinal trees during the plan period. The greenbelt development program is given in **Table 10.1 and table 10.2**. No artificial rainwater harvesting is proposed for the present project.

Table 10.1: Plan for Afforestation

Year	Saplings to be planted	Survival (@ 70%)	Species	Place of Plantation
I	1000	700	<i>Abies pindrow, Betula utilis,</i>	Along the roads, nearby schools, panchyat and public land and other social forestry program.
II	1000	700	<i>Celtis australis, Juglans,</i>	
III	1000	700	<i>Pinus excels, Populus</i>	
IV	1000	700	<i>casipica, Prunus cornuta,</i>	
V	1000	700	<i>Morus alba, Quercus</i>	
Total	5,000	3500	<i>robber, Salix alba, Ziziphus mauritiona</i>	

Guidelines for plantation: The plant species identified for greenbelt development shall be planted using pitting technique. The pit size will be either 45 cm x 45 cm x 45 cm or 60 cm x 60 cm x 60 cm. bigger pit size will be considered at marginal and poor quality soil. Soil used for filling the pit should be mixed with well decomposed farm yard manure or sewage sludge at the rate of 2.5 kg (on dry weight basis) and 3.6 kg (on dry weight basis) for 45cm x 45 cm x 45 cm and 60 cm x 60 cm x 60 cm size pits respectively. The filling of soil should be completed at least 5-10 days before actual plantation. Healthy sapling of identified species should be planted in each pit with the commencement of monsoon. Provision for regular and liberal watering during the summer period during the commissioning stage of the plant will be arranged from the local available resources. The authorities responsible for plantation will also make adequate measures for the protection of the saplings. While making choices of plant species for cultivation in green belt, weight age has been given to the natural native species, bio climatic condition, plants which can be grown as per normal horticultural practices. Plant species identified for greenbelt development, considering the bio-climatic and soil condition.



Selection of Plants for Greenbelts

The main limitation for plants to function as scavenger of pollutants are, plant's interaction to air pollutants, sensitivity to pollutants, climatic conditions and soil characteristics. While making choice of plants species for cultivation in green belts, due consideration has to be given to the natural factor of bio-climate. Xerophytes plants are not necessarily good for greenbelts; they with their sunken stomata can withstand pollution by avoidance but are poor absorber of pollutants. Character of plants mainly considered for affecting absorption of pollutant gases and removal of dust particle are as follows.

For absorption of gases:

- Tolerance towards pollutants in question, at concentration, that are not too high to be instantaneously lethal
- Longer duration of foliage
- Freely exposed foliage
- Adequate height of crown
- Openness of foliage in canopy
- Big leaves (long and broad laminar surface)
- Large number of stomatal apertures

For Removal of Suspended Particular matter:

- Height and spread of crown.
- Leaves supported on firm petiole
- Abundance of surface on bark and foliage
- Roughness of bark
- Abundance of axillary hairs
- Hairs or scales on laminar surface
- Protected Stomata

Objective of Plan:

The main purpose of this plan is to develop greenbelt and landscape at project site so that following specific purpose is met with after completion of the project:

- a. General pollution abatement.
- b. Air pollution attenuation.
- c. Dust absorption.

As envisaged in the National Forest Policy 1988 that one third of the total area should be under green cover to maintain ecological balance in the country. It is very difficult target to attain agricultural state like Haryana but their enormous scope for attaining this target under the developmental projects where the project is designed as fresh and there is change of land use from agriculture primarily to other uses.

Therefore, to attain the target as envisaged under State Forest Policy and National Forest Policy, the provision of green belts/avenue plantations is made under developmental projects. The species proposed should be long rotation, ornamental, evergreen, hardy, wind firm. The species proposed should be long rotation, ornamental, evergreen, hardy, wind firm. The species suitable for urban areas should have capacity to combat pollution.

Table 10.2: Budgetary outlets of greenbelt development for five years

S.NO.	Year	Chakdura (Bathyn & Khrew) No. of plants	Chakdura (Bathyn & Khrew) Budget (Rs. in Lakhs)
1.	2017	1000	10.00
2.	2018	1000	10.00
3.	2019	1000	10.00
4.	2020	1000	10.00
5.	2021	1000	10.00
Total		5000	50.00



10.7 SOCIO-ECONOMIC ENVIRONMENT

10.7.1 Management Plan for Socio-Economic Environment

- i. In general, socio-economic environment will have positive impact due to the mining project in the area.
- ii. The deployed laborers will be from nearby villages only as these people are mainly dependent upon such mining activities.
- iii. In order to further improve the socio-economic conditions of the area, the management will contribute for development works in consultation with local bodies.

10.8 OCCUPATIONAL HEALTH AND SAFETY

Occupational Health and Safety professionals develop and coordinate safety and health systems and strategies within organizations. They identify workplace hazards, assess risks to employee health and safety, and recommend solutions. Increasingly, Health and Safety Professionals are also responsible for many of the environmental aspects of their workplace. As this profession matures there is an increased emphasis on risk management strategy and on the development of workplace culture.

Occupational Health and Safety professionals in the minerals industry may perform the following tasks:

- i. The collection of minor minerals from the Stone mine does not cause any occupational ill effects.
- ii. Except dust generation there is no source which can show a probability for health related diseases and proper dust suppression will control dust generation and dispersion.
- iii. Dust masks will be provided to the workers working in the dust prone areas as additional personal protective equipment.
- iv. The occupational health hazards have so far not been reported.
- v. Awareness program will be conducted about likely occupational health hazards so as to have preventive action in place.
- vi. Any workers health related problem will be properly addressed.
- vii. Periodical medical checkup will be conducted.
- viii. Promote occupational health and safety within their organization and develop safer and healthier ways of working;
- ix. Help supervise the investigation of accidents and unsafe working conditions, study possible causes and recommend remedial action;
- x. Develop and implement training sessions for management, supervisors and workers on health and safety practices and legislation;
- xi. Coordinate emergency procedures, mine rescues, fire fighting and first aid crews;
- xii. Communicate frequently with management to report on the status of the health and safety strategy and risk management strategy, and Develop occupational health and safety strategies and systems, including policies, procedures and manuals.

Table 10.2: Budget for Occupational Health and Safety of the workers (Lakhs)

S.No.	Items	Capital Cost
1.	Measures to Prevent Accidents during mining	2.25
2.	Measures to Prevent Accidents during minerals Transportation.	3.00
3.	Measures to Prevent Accidents due to Trucks/ Dumpers etc.	3.50
4.	Measures to Prevent Dangerous Incidents during Inundation	3.00
5.	Education awareness and first aid kit	2.25
6.	Medical Examination Schedule	6.00
	Total	20.00

10.9 COST OF EMP MEASURES

Following provisions are proposed to be taken for improving, control and monitoring of environment protection measures.



Table 10.3: Budget for EMP

S. No.	Particulars	Capital Cost (Lakh)
1.	Pollution monitoring – Air, Water, Noise and Soil	4.00
2.	Dust Suppression	8.00
3.	Plantation including maintenance	10.00
4.	Haul road and other roads repair and maintenance	10.00
Total		32.00

10.10 SUMMARY

As per above discussion there is no measure impact on the environment due to mining except fugitive emission in the form of dust generated during handling and loading of mineral. The adequate preventive measures will be adopted to contain the various pollutants within permissible limits. Plantation development will be carried out in the mine premises, along the approach roads, around Govt. buildings, schools approx 1000 trees per year. It will prove an effective pollution mitigate technique, and help avoid soil erosion during monsoon season. Employment opportunities will be provided to the locals only as providing extraction of minerals from the mine site is the only prevailing occupation for them for their livelihood. A budget of **Rs.16.00 Lakhs** for Corporate Social Responsibility, budget of **Rs. 20.00 Lakhs** for Occupational Health and Safety and budget of **Rs. 32 Lakhs for EMP** are incurred by Project Proponent.



CHAPTER-11 SUMMARY & CONCLUSION

11.0 GENERAL

The chapter discusses about the summary of whole EIA/EMP report along with recommendation and conclusion. The proposed mining lease area falls in Survey of India Toposheet No. **43J16,43N4,43K13,43O1**. The lease area is located near Vill.- Chakdura, Bathyn and Khrew, Tehsil -Pampore , District- Pulwama (Jammu and Kashmir).

Details of the Project

A	Lease Area Details	
	Lease Area	21.106 Ha.
	Type of Land	Govt. Waste Land
	Topography	The topography of the area forming the hills of Pir Panjal Range is mountainous and rugged one. It is characterized by deep ravines having steep to moderate slopes. The area is marked by small ridges and depression. The ridges trending north and north-west.
	Site Elevation Range	2062 m amsl to 2083 m amsl
B	Production Details	
	Proposed production	53055 TPA (ROM)
	Mineable reserves	36.983444 Tons
C	Cost Details	
	Cost of the project	Rs. 8.00 Crores
	Cost for EMP	Rs. 32.00 Lakh per annum
	Cost of CSR	Rs. 16.00 Lakh per annum
	Cost of OH&S	Rs. 20.00 Lakhs per annum
D	Details of Environmental Setting	
	Ecological Sensitive Areas (National Park, Wild Life Sanctuary, Biosphere Reserve, Reserve/ Protected Forest etc.) within 10 Km radius	There is no National Park, Biosphere Reserves, Tiger Reserves, Wildlife Corridors, etc. within 10 km radius. However Wildlife Sanctuary exist <i>i.e.</i> Dachigam Wildlife Sanctuary : 3.5 Km in N direction.
	Archaeological Important Place	None within 10 Km radius of the project
	Nearest Town/ city	Khrew –3.00 Km, SW.
	Nearest Railway Station	Pampore Railway station – 12.35 Km, SW
	Nearest National Highway	NH -1A, 1.68 Km, SE
	Nearest Airport	Srinagar Air port 23.16 Km,W
	Seismic Zone	Zone VI

11.1 INTRODUCTION

As per EIA Notification dated 14th September, 2006 and amendment in MoEF&CC GOI Notification dated 15.Jan 2016 this project falls under Category “A”, 1(a), due to area 21.106 Ha. and Dachigam Wildlife Sanctuary lies within 10Km radius from mine lease boundary. The project involves extraction of minor mineral of “Lime Stone Mine” at Village- Chakdura, Bathyn and Khrew, Tehsil -Pampore , District- Pulwama (Jammu and Kashmir) by M/s Dawar Cement Pvt. Ltd. The Mining Engineer of Mining Department Pulwama in favor of Shri Mushtaq Muzaffar Anim the project involves total area of 21.106 ha in Village- Chakdura, Bathyn and Khrew, Tehsil -Pampore , District- Pulwama (Jammu and Kashmir) by M/s Dawar Cement Pvt. Ltd.



11.2 PROJECT DESCRIPTION

The proposed project is for mining of minor mineral of “Lime Stone Mine” by open cast mechanized method over an area of 21.106 Ha. by Mushtaq Muzaffar Anim in Village- Chakdura, Bathyn and Khrew, Tehsil -Pampore , District- Pulwama (Jammu and Kashmir) with proposed production capacity of **53055 TPA** of Lime Stone (Minor Mineral). The project site falls under seismic **zone VI** which is moderate damage risk zone (**MSK VII**). Many part of the state of Haryana are prone to flooding. The total geological reserve is 43.222636 **Tons** and total mineable reserve is 36.983444 **Tons**. Mineral Stone will be transported by trucks. It is widely used in construction, buildings, bridges and other infrastructure. Total water requirement for the project is **20 KLD**. Total man power requirement for the project is **39**. The site facilities like canteen, rest-shelter, first aid facility, water and electricity supply etc. will be provided as per requirement. There is no litigation pending against this project.

11.3 ANALYSIS OF ALTERNATIVES

The proposed project is for mining of minor mineral of “Lime Stone Mine” is a site specific mining project; therefore no alternate site has been selected.

11.4 DESCRIPTION OF THE ENVIRONMENT

Environmental data has been collected in relation to proposed mining for Air, Noise, Water, Soil, Ecology and Biodiversity. The generation of primary data as well as collection of secondary data and information from the site and surroundings was carried out during. March-May 2016. The EIA study is being done for the Mine Lease (core zone) and area within 10 Km distance from mine lease boundary (buffer zone), both of which together comprise the study area.

Table 11.1: Baseline Environment Status

Parameters	Baseline Status
Ambient Air Quality	PM ₁₀ – 45.2 µg/m³ and 76.3 µg/m³ PM _{2.5} – 23.6 µg/m³ and 56.3 µg/m³ SO ₂ – 6.00 µg/m³ and 10.6 µg/m³ NOx – 13.1 µg/m³ and 29.00 µg/m³
Noise Level	Noise Level During Night Time – 40.50 Leq dB and 42.10 Leq dB Noise Level During Day Time – 53.00 Leq dB and 53.50 Leq dB
Water Quality	Ground Water: All the Parameters Like TDS (199.00 to 410.00 mg/L), pH (7.16 to 7.79), Total Hardness (101.54 to 168.16 mg/L) etc. are found within the permissible limits.
	Surface Water: All the Parameters Like TDS (266.00 to 270.00 mg/L), pH (7.63 to 7.98), Total Hardness (116.08 to 196.00 mg/L) etc. are found within the permissible limits.
Soil Quality	pH - 6.63 to 7.66 Organic matter- 0.29% to 0.72% , Nitrogen- 181 kg/ha to 260.10 kg/ha , Phosphorus- 28.58 kg/ha to 58.13 kg/ha & Potassium- 76.80kg/ha to 90.00 kg/ha .
Ecology And Biodiversity	There is no National Forest, Biosphere Reserves, Tiger Reserves, Wildlife Corridors, etc. within 10 km radius. However Wildlife Sanctuary within 10 Km radius of study area is hereunder: Dachigam Wildlife Sanctuary: 3.5 Km in N direction.

11.5 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The proposed mining operations are not anticipated to raise the concentration of the pollutants beyond prescribed limits. However, the measures are suggested to mitigate any harmful impacts of pollutants like plantation of trees along haul roads, specially near settlements, to help to reduce the impact of dust on the nearby villages; planning transportation routes of mined material so as to reach the nearest paved roads by shortest route; regular water sprinkling on unpaved roads to avoid dust generation during transportation etc. Some of impacts may be due to increase in the PCU/hr which is 15 PCU/hr.



Transportation of Lime Stone should be minimized in the morning and evening and cannot be done in night. Access roads will not encroach into the riparian zones. Fugitive emission from vehicle movement will form a layer in leaves thus reducing the gaseous exchange process. The impact on the present noise levels due to mining operations will be restricted to the work zone areas only. The impact on the ambient noise levels will not be felt at the settlement areas due to masking effect with the existing noise levels. There is no drilling and blasting envisaged in this mining so there is no impact of vibration due to this project. Hence, the noise levels and vibration impact due to the proposed mining operations on community will be minimal. There will be no waste water generation from the proposed mining activity except sanitary waste water generation that will be treated in septic tanks and will be used for plantation purpose. The municipal solid waste generated at mine site will have adverse impact on human health. The mining activities will be done in a systematic manner by maintaining the road infrastructure and vehicle transport which will be protective measure for preserving the topography and drainage in the area. The ownership will not be changed as the land has been taken on contract which will be returned as it is after the contract period is over. No human settlement should be permitted in the lease mining or nearby area. No mining will be carried out during the rainy season to minimize impact on aquatic life. The mining of limestone is likely to increase the per capita income of local people by which the socio-economic status of the people will be improved. The local people have been provided with either direct employments or indirect employment such as business, contract works and development work like roads, etc. and other welfare amenities such as medical facilities, conveyance, free education, drinking water supply etc. Except dust generation, there is no source which can show a probability for health related diseases. Regular water sprinkling will be done with sprinkle mounted tankers and dust masks will be provided to the workers. All workers will be subjected to medical examination as per Mines Rule 1955 both at time of appointment and at least once in a year. Medical camps will be organized for this activity. Insurance of all employees as per the rules will also be carried out. No displacement is involved for the proposed project. Hence, R&R plan is not applicable for the project.

11.6 ENVIRONMENTAL MONITORING PROGRAM

In order to maintain the environmental quality within the stipulated standards, regular monitoring of various environmental components is necessary which will comply as per conditions. For this the lessee **Mushtaq Muzafar Anim** has taken decision to formulate an Environment Policy of the mine and constitute an Environmental Management Cell and committed to operate the proposed mine with the objectives mentioned in approved Environment Policy. EMP may also require measurement of ambient environmental quality in the vicinity of a site using ecological/biological, physical and chemical indicators. Monitoring may include socio-economic interaction, through local liaison activities or even assessment of complaints. Regular Monitoring of all the environmental parameters viz., air, water, noise and soil as per the formulated program based on CPCB and MoEF&CC guidelines will be carried out every year. The location of the monitoring stations was selected on the basis of prevailing micro meteorological conditions of the area like; wind direction and wind speed, relative humidity, temperature. A budget for monitoring of Air, water, Noise and Soil will be **Rs. 4 Lakhs** as capital cost to be incurred by the project proponent for undertaking pollution prevention measures during the mining activity.

11.7 ADDITIONAL STUDIES

Risk assessments will help mine operators to identify high, medium and low risk levels. This is a requirement of the Occupational Health and Safety Act 2000. Risk assessments will help to prioritize the risks and provide information on the need to safely control the risks. In this way, mine owners and operators will be able to implement safety improvements. Mining and allied activities are associated with several potential hazards to both the employees and the public at large. A worker in a mine will be able to work under conditions, which are adequately safe and healthy. At the same time the environmental conditions also will not impair his working efficiency. This is possible only when there is adequate safety in mines. Hence mine safety is one of the most essential aspects of any working mine. The conservation plan suggested here is for scheduled fauna (Animal and Bird) will be implemented by the mining lease holder and the budgetary provision is discussed and given in detail for the implementation of the same in the area. It is very important to conserve the scheduled fauna in the area by the local authority as well as by



the forest officials. People are not aware about the wildlife and protection of wild animals. There is an urgent need of education and awareness to local people about the wild life and their importance. A green belt will be developed around the core zone. Green belt plantation will be started with the beginning of the mining and will be completed within five years from the beginning. This plantation will be done at selected places only and only local species will be used in the plantation. This mining project has positive impact on social and economic well being of the community because this project provides employment opportunities to local people and many social welfare works done by project proponent. There is no displacement of the population within the project area and adjacent nearby area.

11.8 PROJECT BENEFIT

The management will recruit the semi-skilled and unskilled workers from the nearby villages. The project activity and the management will definitely support the local Panchayat and provide other form of assistance for the development of public amenities in this region. The company management will contribute to the local schools, dispensaries for the welfare of the villagers. A suitable combination of trees that can grow fast and also have good leaf cover will be adopted to develop the green belt. It is proposed to plant 2790 no's per annum no's of native species along with medicinal trees during the mining plan period. The project proponent has allocated **Rs. 16.00 Lakhs** per annum for CSR Activities. Other than this social development of village will be considered as per social activities.

11.9 ENVIRONMENTAL COST BENEFIT ANALYSIS

It is considered desirable that the mining project may be implemented. Project cost for the proposed project is for mining of Lime Stone over an area of 21.106 ha near Village- Chakdura, Bathyn and Khrew, Tehsil - Pampore , District- Pulwama (Jammu and Kashmir) is **Rs. 8.00 Crores**. The profit will be Rs. 200 per tons.

11.10 ENVIRONMENTAL MANAGEMENT PLAN

As per above discussion there is no measure impact on the environment due to mining except fugitive emission in the form of dust generated during handling and loading of mineral. The adequate preventive measures will be adopted to contain the various pollutants within permissible limits. Plantation development will be carried out in the mine premises, along the approach roads, around Govt. buildings, schools approx 1000 trees per year. It will prove an effective pollution mitigate technique, and help avoid soil erosion during monsoon season. Employment opportunities will be provided to the locals only as providing extraction of minerals from the mine site is the only prevailing occupation for them for their livelihood. A budget of **Rs.16.00 Lakhs** for Corporate Social Responsibility, budget of **Rs. 20.00 Lakhs** for Occupational Health and Safety and budget of **Rs. 32.00 Lakhs for EMP** are incurred by Project Proponent.

11.11 CONCLUSION

From the baseline study and various discussion on probable impacts of all the operational activity, it has been concluded that this project will more positive impact and will generate the revenue and employment in the area. On the above facts and baseline study, the proposed activity is recommended for the commencement with proper mitigation measure as suggested.



CHAPTER-12

DISCLOSURE OF CONSULTANT ENGAGED

12.0 Introduction

Vardan EnviroNet, established on 16th August 2012, is an accredited organization by Quality Council of India/NABET (National Accreditation Board for Education and Training) certificate no. **NABET/EIA/1316/IA001**. The updated list of accredited consultant is also available online at <http://nabet.qci.org.in/environment/pop.asp?file=documents/Annexure7.pdf&heading=Accredited%20EIA%20Consultant%20Organizations%20with%20accredited%20sectors>. We have our in-house Environmental Laboratory named "Vardan EnviroLab" at Village Samaspur, Opposite Amity International School, Sector 51, Gurgaon (Haryana) approved by National Accreditation Board for Testing and Calibration Laboratories, Govt. of India (NABL).

12.1 Declaration

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

EIA Coordinator: R.S Yadav



Signature

Date: 20.05.2017

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

Team Member: Mr. Anshul Yadav



Signature

Date: 20.05.2017



Attested
Secretary
G.N. CHOWDRY
I.B.P. Pwdo. No. RGP/100W- 81772-2



Government of Jammu and Kashmir
Civil Sectt. Industries & Commerce Department.

Subject:- Grant of Mining lease for Limestone at Village Chakdura District Pulwama in favour of Sh. Mushtaq Muzaffar Anim S/O Haji Mohd Muzaffar R/O Srinagar C/O Dawar Cements Khrew.

Reference (i) Letter No 492MF/DGM/ML/04-05/934 date 29-01-2008 from Director, Geology and Mining Department Jammu.
(ii) Letter No 614(2)/MP-B-239/06-DUN dated 13-06-2006 Govt. of India, Ministry of Mines, IBM, Dehradun.

Government Order No 317 IND of 2008

Dated: 31 -12- 2008

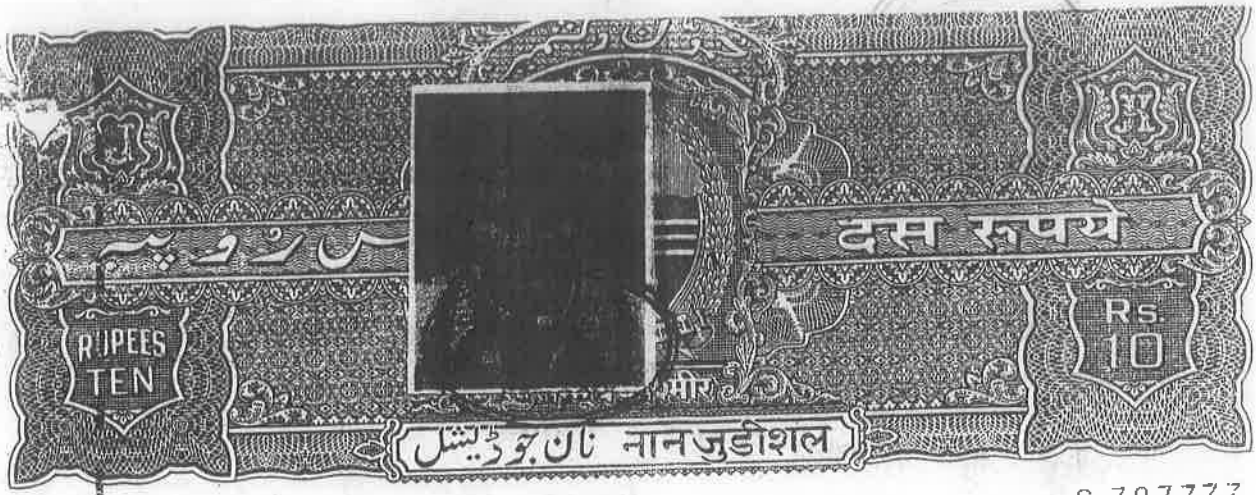
Sanction is accorded to the grant of Mining lease for Limestone occurring over an area of 21.106 hectares in Village Chakdura District Pulwama falling under Khasra No.s 3184-min in favour Sh. Mushtaq Muzaffar Anim S/O Haji Mohd. Muzaffar Anim R/O Srinagar. The Mining lease will subsist for a period of twenty years for captive purpose and working of the deposit will be strictly carried out in accordance with the approved Mining Plan of the Indian Bureau of Mines, Govt. of India. The lease will be subject to the condition that the promoter will get the EIA/EMP prepared and approved from Government of India within a period of two years and subject to the following conditions:-

- (i) the lessee shall have no objection to the conducting of further investigation in the leased area by the Geology and Mining Department as and when required.
- (ii) the lessee shall abide by the provisions of Mines and Minerals (Regulation and Development) Act, 1957 and Mineral Concession Rules, 1960.
- (iii) the lessee shall execute lease deed with the Govt. in accordance with rules 31 of the Mineral Concession Rules, 1960.
- (iv) the lessee shall extract the limestone which shall be used in industrial units,
- (v) the mining lease shall be strictly governed by Rule 26 of Mineral Concession Rules, 1960.
- (vi) the lessee shall put under green cover the area which becomes available after excavation done up to road level and
- (vii) no digging or excavation shall be done below the level of the road.

By order of the Government of Jammu and Kashmir

S.P.

Commissioner, Industries & Commerce Govt.



G 797333

Form "K"

THIS INDENTURE made this 13 day of Feb. 2009 between the Governor of Jammu and Kashmir (hereinafter referred as the 'State Government' which expression shall where the context so admits be deemed to include the successors and assignees of the one part and Sh. Mushtaq Muzaffar Anim S/o Haji Mohd Muzafar Anim R/o Srinagar (hereinafter referred as the "the lessees" which expression shall where the context so admits be deemed to include their respective heirs, executors, administrators, representatives and permitted assignees) of the other part. WHEREAS the lessees has applied to the State Government in accordance with the Mineral Concessions Rules, 1960 (hereafter referred to as the said rules) for the mining lease of Limestone in respect of the lands described in Part I of the schedule here under written and has/have deposited with the State Government the sum of Rs 10,000/= as security vide CDR No. 1691129 Dated 13.02.2009 and the sum of Rs. 35,00/= vide T R No 21 dated 28.06.2004. For meeting the preliminary expenses for a mining lease.

Where as mining lease was granted in favour of Sh. Mushtaq Muzaffar Anim S/o Haji Mohd Muzafar Anim R/o Srinagar) Vide Government Order No. 317-IND of 2008 dated 31.12.2008.

WITNESS that in consideration of the rents and the royalties covenants and agreements by and in these presents and the schedule here under written reserved and contained and on the part of the lessees to be paid observed and performed, the State Government hereby grants and demises unto lessee All those the mines beds of Limestone (hereinafter and in the schedule referred to as the said minerals) situated lying and being in or under the lands which are referred to in Part I of the said schedule, together with liberties, powers, and privileges to be exercised or enjoyed in connection herewith which are mentioned in Part II of the said schedule subject to the restrictions and conditions as to the exercise and enjoyment of such liberties, powers and privileges which are mentioned in part III of the said schedule EXCEPT and reserving out of the demise unto the State Government the liberties, powers and privileges mentioned in part IV of the said schedule. TO HOLD the premises hereby granted and demised unto the lessees from 26th day of Feb. 2009 for the term of 20 years thence ensuing YIELDING AND PAYING therefore unto the State Government the several rents, royalties mentioned in part V of the said schedule at the respective times therein specified subject to the provisions contained in part VI of the said schedule and the lessee hereby covenants with the State Government as in Part VII of the said schedule as expressed and the state Government hereby covenants with the lessee as in part VIII of the said schedule as expressed AND it is hereby mutually agreed between the parties hereto as in part IX of the said schedule is expressed.

Signature

Attested by G.N. CHOWDRY

G.N. CHOWDRY R/2009

Signature

Director Geology & Mining Dept. J & K Govt. Jammu / Srinagar

PHOTO COPY ATTACHED

25/3/09
11/2/09
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25/3/09
Muzaffar
Muzaffar
to Dhamu

25/3/09
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25
25/3/09
Muzaffar
Muzaffar
to Dhamu

This document is presented today on 26th day of March 2009, Thursday, at 12:25 P.M. by the rep. of lessor namely Asadul Majid via Mineral office Kashmir, & the lessee namely Mushtaq Muzaffar s/o Mohd. Muzaffar ^{Amir} R/o Haiderpora Bye Pass Srinagar for registration.



The contents of the document and its execution is admitted by the executants who are identified by Mushtaq Ahmed Khan s/o Gulam Mohd. Khan R/o Iqbal colony Zainakote Srinagar. Reg. fee of Rs. 05/- is received vide QR no. 1684785. Stamps worth Rs. 19681/- is ~~received~~ ~~vide QR no.~~ are attached to document. Return after completion of registration.

Sub Registrar
(Muzaffar) Pattapora
26/03/09

Lessor's Rep.

Lessee

Identified by

PHOTO COPY ATTESTED

S. K. Sreen
Advocate
Notary Public Jammu

Attested



SCHEME OF MINING WITH PROGRESSIVE MINE CLOSURE PLAN.

(Submitted under Rule(12(3) & 23 B(2) of MCDR, 1988 for fresh grant/renewal/working lease/retained/revised area)
OF

CHAKDURA LIMESTONE MINE (21.106 HECTARES) Khasra No. 3184

VILLAGE: BATHYN, KHREW TEHSIL: PAMPORA

DISTRICT: PULWAMA STATE: JAMMU AND KASHMIR

TOTAL LEASE AREA: 21.106 Hect. (NON-FOREST 21.106 Hect.)(State land)

LEASE PERIOD FROM March 2009 TO 25-03-2029.

This Mining Plan/Scheme of Mining/PMCP
Has Been Approved Vide Letter No. 614(2)
MS-B-235/13-DDN
DL 6/11/13 Under MCDR, 1988/MCR, 1980

PERIOD OF SCHEME/ PMCP FROM 2013 TO 2018.



LESSEE: MUSHTAQ MUZAFAR ANEM

ARCO HOUSE, SHALAPORA, ALOCHIBAGH SRINAGAR, 190009, J&K
Cell No. 09906574764, 01942310458, e-mail: arco_dcpl@yahoo.com

(IBM Reg. No.) IBM/12151/2012)

Prepared By:

G.N. CHOWDRY

RQP/DDN/148/2002/A

Valid upto 04/09/2014

Cell No.:- 09419086373, e-mail-gnchowdry@yahoo.com

(Signature)
उप खान नियंत्रक
Deputy Controller of Mines
भारतीय खान ब्यूरो.
Indian Bureau of Mines

By Speed Post

No. J-11015/324/2013-IA.II (M)(Pt.)
 Government of India
 Ministry of Environment, Forest & Climate Change
 Impact Assessment Division

Indira Paryavaran Bhavan,
 Vayu Wing, 3rd Floor,
 Aliganj, Jor Bagh Road,
 New Delhi-110 003

Dated: 22nd January, 2016

To,

M/s Dawar Cements Pvt. Ltd.
 Arco House, Shallapora,
 Allochi Bagh,
 Srinagar, J & K -190009.

Sub.: Limestone Mining with production capacity of 50,000 TPA (ROM) by M/s Dawar Cements Pvt. Ltd., located at Chakdura, Khrew, Tehsil Pampora, District Pulwama, J&K State (21.106 ha) - Prescribing TOR regarding.

Sir,

This has reference to above mentioned proposal for determining 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. For this purpose, the Proponent had submitted information in the prescribed format (Form-1) along with a Pre-feasibility Report. The proposal was appraised by the Reconstituted Expert Appraisal Committee in its 12th meeting held during October 31- November 1, 2013. This is a Violation case. The actions have been completed in 2015.

2. The proposal of M/s Dawar Cements is for mining of cement grade Limestone with production capacity of 50,000 TPA (ROM) in 21.106 ha. The mine lease area is located in Khasra No. 3184 Min, Village Chakdura (Khrew), Tehsil Pampore, District Pulwama, Jammu & Kashmir State. The Latitudes and Longitudes of mine lease area is 34003'15" N to 34003'42" N and 75000'19" E to 750 00'44" E respectively and the lease area is covered under Survey of India Toposheet no. 43 N/4.

3. It is a Category 'A' project as Dachigam National Park lies within 10km radius from the mine lease boundary. The lease was granted by the J&K Government vide order no 317 IND dated 31.12.2008 in favour of Mushtaq Muzaffar Anem S/o Haji Mohd Muzaffar, one of the directors of M/s Dawar Cement. The lease period is valid for 20 years. No diversion of forest land is involved. Open cast semi-mechanized mining method will be adopted for limestone mining. Drilling will be done with the help of Jack hammer (32 mm diameter). The loading of sized limestone and other grade (undersized) is done manually and transported by tipper/dumper to the crusher located outside the mining

TOR to M/s Dawar Cements Pvt. Ltd. (21.106ha)

Page 1 of 9

25/06/2014

lease. Project will produce limestone @ 0.05 million tonne per annum, which will be used as raw material for production of cement / clinker in Dawar Cement Plant. On the basis of minable reserves of 17 million tonne and production rate of 0.05 million tonnes per annum, the expected life of mine has been assessed as 337 years. Total water requirement will be 10 KLD for human consumption, plantation and dust suppression, which shall be met from the ground water source i.e. tube well.

4. The mining lease was executed in 2009 and development of road and a few benches was carried out during last few years which produced 1, 17,812 tonnes of limestone. The Committee noted that it is a **violation** case as the Project Proponent had started production of limestone without obtaining requisite prior environmental clearance since 2008 to 2013. As per the PFR, the Project Proponent had mined out 1,17,812 tonnes of limestone. Project Proponent informed that the mine is closed since June 2013. The Ministry has initiated action on violation vide letter of even no. dated 1.04.2014. Accordingly, the J&K, State Pollution Control Board has a filed court case in 2015 before the Hon'ble Court of Chief Judicial Magistrate, Srinagar under Section 15 of E(P) Act, 1986. The project proponent has submitted the Board Resolution vide letter dated 18.04.2014 mentioning that no violation of E (P) Act, 1986 repeated in future.

5. Based on the information in the documents submitted and the presentation made before the Committee for mining projects, the following TOR are prescribed for undertaking detailed EIA study:-

A. Standard TOR

- 1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.
- 2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.
- 3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.
- 4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
- 5) Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.

- 6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.
- 7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.
- 8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.
- 9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.
- 10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
- 11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.
- 12) A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.
- 13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.

- 14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.
- 15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.
- 16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.
- 17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.
- 18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan alongwith budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.
- 19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered.
- 20) Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).
- 21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be

clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.

- 22) One season (non-monsoon) [i.e. March - May (Summer Season); October - December (post monsoon season) ; December - February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM₁₀, particularly for free silica, should be given.
- 23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.
- 24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.
- 25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.
- 26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
- 27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.
- 28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-ally, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.
- 29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.

TOR to M/s Dawar Cements Pvt. Ltd. (21.106ha)

Page 5 of 9

- 30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.
- 31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.
- 32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.
- 33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.
- 34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.
- 35) Occupational Health Impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
- 36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
- 37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
- 38) Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of

agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.

- 39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.
- 40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
- 41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
- 42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.
- 43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.

B. ADDITIONAL TOR

- 44) Details of Transportation of mined out materials as per the Indian Road Congress for both the ways (loaded as well as unloaded trucks) load and its impact on Environment,
 - 45) Proper species specific Conservation plan for Schedule-I and II species.
 - 46) Necessary NBWL clearance should be obtained.
6. Besides the above, the below mentioned general points are also to be followed:-
- a) All documents to be properly referenced with index 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) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.
 - d) Where the documents provided are in a language other than English, an English translation should be provided.
 - e) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and 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-11013/41/2005-

IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.

- g) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.
 - h) As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.
 - i) 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.
7. 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.
8. The prescribed TORs would be valid for a period of three 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, 22.08.2014, 08.10.2014 and 07.11.2014. The instant TOR is valid upto **21.01.2019**.
9. 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.

Yours faithfully,

(Dr. U. Sridharan)
Director (S)


Copy to:

- 1). **The Secretary**, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi
- 2). **The Secretary**, Department of Mines & Geology, Government of Jammu & Kashmir.
- 3). **The Secretary**, Jammu & Kashmir, Department of Forests, Government of Jammu & Kashmir, Forest Complex, Sheikh Bagh, Near Lal Chowk, Srinagar (J&K).
- 4). **The Secretary**, Jammu & Kashmir, Department of Environment, Government of Jammu & Kashmir, Forest Complex, Sheikh Bagh, Near Lal Chowk, Srinagar (J&K).

TOR to M/s Dawar Cements Pvt. Ltd. (21.106ha)

Page 8 of 9

- 5). **The Additional Principal Chief Conservator of Forests (C)**, Additional Principal Conservator of Forests (C), Ministry of Environment, Forest and Climate Change, Regional Office (NZ), Bays No. 24-25, Sector 31 A, Dakshin Marg, Chandigarh - 160030
- 6). **The Chairman**, J&K State Pollution Control Board, Parivesh Bhawan, Forest Complex, Gladni, Narwal, transport Nagar, Jammu (J&K)
- 7). **The District Collector**, District Pulwama, State of Jammu & Kashmir.
- 8). **Guard File.**
- 9). **MoEF&CC website.**


(Dr. U. Sridharan)
Director (S)

By Speed Post

No. J-11015/324/2013-IA.II (M)(Pt.)

Government of India
Ministry of Environment, Forest & Climate Change
Impact Assessment Division

Indira Paryavaran Bhavan,
Vayu Wing, 3rd Floor, Aliganj,
Jor Bagh Road, New Delhi-110 003

Dated: 14th September, 2016

To,

M/s Dawar Cements Pvt. Ltd.
Arco House, Shallapora,
Allochi Bagh,
Srinagar, J & K -190009

Sub.: Limestone Mining with production capacity of 50,000 TPA (ROM) by M/s Dawar Cements Pvt. Ltd., located at village -Chakdura, Khrew, Tehsil-Pampora, District - Pulwama, J & K (MLA: 21.106ha)- Amendment of TOR dated 22.01.2016 w.r.t. production capacity from "50,000 TPA(ROM) to 53,055 TPA TPA(ROM)."

Sir,

This has reference to your above mentioned proposal for M/s Dawar Cements is for amendment in TOR dated 22 January, 2016 w.r.t production capacity from "50,000 TPA (ROM) to 53,055 TPA (ROM)." The mine is located in Khasra No.3184, near village - Chakdura, (Khrew), Tehsil- Pampora, District - Pulwama, J & K in the mine lease area of 21.106 ha. The project falls in category 'A' as the Dachigam Wildlife Sanctuary is located 2.1 Km towards N direction from mine lease boundary. The Project Proponent submitted the updated Form-1 and PFR and requested the amendment in TOR as the production capacity has been increased to 53,055 TPA (ROM) to 53,055 TPA (ROM) as per the approved mining plan.

2. The Proposal was appraised by the Reconstituted Expert Appraisal Committee in its 9th meeting held during **August 22-23, 2016**. The matter was examined in the Ministry and accordingly, the Committee **recommended** the proposal for Amendment in TOR dated 22.01.2016 w.r.t. production capacity from "50,000 TPA (ROM) to 53,055 TPA (ROM).

3. All other terms and conditions mentioned in this Ministry's TOR letter no. J-11015/324/2013-IA.II (M) dated 22.01.2016 shall remain the same.

4. This issues with the approval of the Competent Authority.

Yours faithfully,


(Surendra Kumar)
Director (S)

Copy to:

- 1). **The Secretary**, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi
- 2). **The Secretary**, Department of Mines & Geology, Government of Jammu &

Page 1 of 2

- Kashmir.
- 3). **The Secretary**, Jammu & Kashmir, Department of Forests, Government of Jammu & Kashmir, Forest Complex, Sheikh Bagh, Near Lal Chowk, Srinagar (J&K).
 - 4). **The Secretary**, Jammu & Kashmir, Department of Environment, Government of Jammu & Kashmir, Forest Complex, Sheikh Bagh, Near Lal Chowk, Srinagar (J&K).
 - 5). **The Additional Principal Chief Conservator of Forests (C)**, Additional Principal Conservator of Forests (C), Ministry of Environment, Forest and Climate Change, Regional Office (NZ), Bays No. 24-25, Sector 31 A, Daxin Marg, Chandigarh - 160030
 - 6). **The Chairman**, J&K State Pollution Control Board, Parivesh Bhawan Forest Complex, Gladhi, Narwal, transport Nagar, Jammu (J&K)
 - 7). **The Controller General**, Indian Bureau of Mines, Indira Bhavan, KAN Lines, Nagpur-440 001.
 - 8). **The District Collector**, District Pulwama, State of Jammu & Kashmir.
 - 9). **Guard File.**
 - 10). **MoEF&CC website.**


(Surender Kumar)
Director

Government of Jammu & Kashmir
Office of the Principal Chief Conservator of Forests, Jammu.

** ** *

Sub:- NOC in favour of M/s Dawar Cement Pvt. Ltd. For establishment mining lease plant & cements manufacturing plant Khrew.

<><><>

As recommended by the Chief Conservator of Forests Kashmir vide his letter No:-CCF/K/L/3719 dated:-10.12.2004, as also based on the NOC issued by the Chief Wildlife Warden J&K Government vide his endorsement No:WLP/192-93/Estt/04 Dt:4.06.2004, NOC issued by Member Secy. J&K SPCB vide No. SPCB/NOC/90/02/597-98 Dt:10.06.2003 and Tehsildar Pulwama. The Forest Department has no objection for establishment of mining lease and cements manufacturing unit at Khrew District Pulwama. The NOC is issued subject to the following terms and conditions:-

1. That the N.O.C shall not be construed assurance or permission of raw material from the Forest Department.
2. That the unit shall not pose any problem to Soil erosion or other environmental or ecological hazards to the area.
3. That no forest land is involved for procuring of raw material to the unit.
4. That they will abide by the J&K Forest (Conservation) Act 1997 (amended) upto 2002 and J&K Forest Act Samvat 1987(1930-AD) (Amended upto December 1997).
5. That the plant will not affect the flora and fauna in view of the environmental and ecological consideration of the area.
6. That they will ensure that no illegal raw material is admixed while manufacturing the product.
7. That the NOC will be cancelled if it is found that raw material has been obtained clandestinely.
8. That any policy to be issued in future by the Govt. or Forest Department shall be binding upon the unit holder.
9. That the NOC is also subject to the conditions laid down by the Pollution Control Board, Wildlife Protection Department and Revenue Deptt.
10. That this NOC is liable for revocation or cancellation in the event of any misuse or un authorized diversion or any violation determined by the Forest Department at any time with out any notice.
11. That the unit holder will furnish an undertaking to the effect that they will abide by the all above said terms and conditions.

(S.D. Swatantra) IFS
Pr. Chief Conservator of Forests

NO:PCCF/Lease/NOC/ 57-61

DT: 19/01/2005.

Copy for information and necessary action to the:-

1. Chief Conservator of Forests, Kashmir.
2. Conservator of Forests, South Circle.
3. DFO, Shopian. forest Division
4. General Manager DIC, Pulwama.
5. M/s Dawar Cements Pvt. Ltd.

Office of the Range officer wildlife Range Khrew.

The wildlife warden,
Central Division,

Srinagar.

NO:- 28/KHR/39-40.

DT:- 11-5-2015.

Subject:- Distance of mining leased area of M/s Damsar Cements Pvt Ltd Khrew from Dachigam National park and nearest C. Reserve.

Ref:- Your office encl. no.: WLWC/Estt/13-14/1171 Dt 8-11-2013.

Sir,

In response to this office letter no:- 28/KHR/350-57 Dt 21-01-2015, the above mining lease holder has submitted the site plan of leased out area, ma. noc. Forest, wildlife. Copy of lease deed and copy of Govt order no:- 317 IND of 2008. The above mining leased area (21.106) Hect. falls under survey no 3184, recorded as Kahcharae (Shamilat deh) located at checkdara Khrew near beat Bathow Bajnari as per the report of the Tehsildar Pamposh copy enclosed. The area leased out already was inspected by the assigned alongwith B.O. Khrew and concerned staff on 20-4-2015 and the Geo coordinates of mining leased area and nearest beat boundary were recorded on spot as under

Mining Leased Area

(1) N:- 34°03.415'
E:- 75°00.518'
Alt 2065mtr

(2) N:- 34°03.366'
E:- 75°00.786'
Alt:- 1970mtr

(3) N:- 34°03.413'
E:- 75°00.478'
Alt 2042mtr

(4) N:- 34°03.380'
E:- 75°00.625'
Alt 2050mtr

(5) N:- 34°03.263'
E:- 75°00.747'
Alt 1953mtr

Beat Boundary

I N:- 34°03.523'
E:- 75°00.435'
Alt:- 2108

II N:- 34°03.425'
E:- 75°00.475'
Alt:- 2036mtr

The above leased area is about 250 metres away from the nearest beat boundary of Bathow Bajnari of Khrew Block and the minimum aerial distance from Dachigam National park is 3.5 kms. As such the same is submitted for favour of information and further necessary actions at your end please.
(Enclosed 8 sheets)

Shreshth G. G. G.
B.O. Khrew
Yours faithfully,

Sd/-
Range officer
Khrew.

Copy to M/s Damsar Cements Pvt Ltd Khrew for favour of info

Tahmid Khan
Range officer
Khrew.

Map Showing Minimum Distance from Dachigam National Park Boundary Line and Conservation line to the leased area of Dawar Cements at Chakdura, Khrew District Pulwama J&K.





भारत का राजपत्र The Gazette of India

असाधारण

EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (ii)

PART II—Section 3—Sub-section (ii)

प्राधिकार से प्रकाशित

PUBLISHED BY AUTHORITY

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No.1402]

NEW DELHI, WEDNESDAY, JULY 1, 2015/ASHADHA 10, 1937

पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

अधिसूचना

नई दिल्ली, 30 जून, 2015

का.आ. 1783(अ).— केन्द्रीय सरकार, पर्यावरण (संरक्षण) नियम, 1986 के नियम 10 के साथ पठित पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 12 की उपधारा (1)के खंड (ख) और धारा 13 द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, भारत सरकार के तत्कालीन पर्यावरण और वन मंत्रालय की अधिसूचना संख्यांक का.आ. 1174(अ) तारीख 18 जुलाई, 2007 का निम्नलिखित और संशोधन करती है, अर्थात् :-

उक्त अधिसूचना की सारणी में क्रम सं. 126 और उससे संबंधित प्रविष्टियों के पश्चात् निम्नलिखित क्रम संख्यांक और प्रविष्टियां अंतःस्थापित की जाएंगी, अर्थात् :-

(1)	(2)	(3)	(4)
"127	मैसर्स वरदान इन्वायरोलेब, सेक्टर-51, समसपुर, एमेट्टी स्कूल के सामने, गुडगांव-122001 (हरियाणा)	(1) श्री एस.के. शर्मा (2) श्री राजेन्द्र सिंह यादव (3) श्री गौरव प्रताप सिंह	30.06.2015 से 29.06.2020" ;

[फा. सं. क्यू-15018/23/2013-सीपीडब्ल्यू]

डा. राशिद हसन, सलाहकार

टिप्पण: मूल अधिसूचना भारत के राजपत्र, असाधारण, में संख्यांक. का.आ. 1174(अ), तारीख 18 जुलाई, 2007 द्वारा प्रकाशित की गई थी और तत्पश्चात् अधिसूचना सं० का.आ. 1539(अ), तारीख 13 सितंबर, 2007, का.आ. 1811(अ), तारीख 24 अक्तूबर, 2007, का.आ. 55(अ), तारीख 9 जनवरी, 2008, का.आ. 428(अ), तारीख 4 मार्च, 2008, का.आ. 865(अ), तारीख 11 अप्रैल, 2008, का.आ. 1894(अ), तारीख 31 जुलाई, 2008, का.आ. 2728(अ), तारीख 25 नवंबर, 2008, का.आ. 1356(अ), तारीख 27 मई, 2009, का.आ.1802(अ)तारीख 22 जुलाई, 2009, का.आ.2399(अ)तारीख 18 सितंबर, 2009,का.आ. 3122(अ), तारीख 7 दिसंबर, 2009, का.आ. 3123(अ), तारीख 7 दिसंबर, 2009, का.आ. 142(अ), तारीख 21 जनवरी, 2010, का.आ. 619(अ), तारीख 19 मार्च, 2010, का.आ. 1662(अ), तारीख 13 जुलाई, 2010, का.आ. 2390(अ), तारीख 30 सितंबर, 2010, का.आ. 2904 (अ), तारीख 8 दिसंबर, 2010, का.आ. 181(अ), तारीख 28 जनवरी, 2011, का.आ. 692(अ), तारीख 5 अप्रैल, 2011, का.आ. 1537(अ), तारीख 6 जुलाई, 2011, का.आ. 1754(अ), तारीख 28 जुलाई, 2011, का.आ. 2609(अ), तारीख 22 नवंबर, 2011, का.आ. 264(अ), तारीख 13 फरवरी, 2012, का.आ. 1150(अ), तारीख 22 मई, 2012, का.आ. 2039(अ), तारीख 5 सितंबर, 2012, का.आ. 2802(अ), तारीख 27 नवंबर, 2012 और का.आ. 2850(अ), तारीख 7 दिसंबर, 2012 तथा का.आ. 592(अ), तारीख 8 मार्च, 2013, का.आ. 945(अ), तारीख 8 अप्रैल, 2013, का.आ.2287(अ),तारीख 27 जुलाई, 2013, का.आ.2288(अ),तारीख 27 जुलाई, 2013,का.आ.3489(अ),तारीख 26 नवंबर, 2013, का.आ.21(अ),तारीख 3 जनवरी, 2014, का.आ.561(अ),तारीख 26 फरवरी, 2014, का.आ.1205(अ),तारीख 5 मई, 2014, का.आ.1190(अ),तारीख 2 मई, 2014, का.आ.2003(अ),तारीख 6 अगस्त, 2014 और का.आ.137(अ),तारीख 12 जनवरी, 2015 द्वारा उसका संशोधन किया गया था

MINISTRY OF ENVIRONMENT, FORESTS AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 30th June, 2015

S.O. 1783(E).—In exercise of the powers conferred by clause (b) of sub-section (1) of section 12 and section 13 of the Environment (Protection) Act, 1986 (29 of 1986) read with rule 10 of the Environment (Protection) Rules, 1986, the Central Government hereby makes the following further amendments in the notification of the Government of India in the erstwhile Ministry of Environment and Forests, number S.O. 1174(E), dated the 18th July, 2007, namely :-

In the said notification, in the Table after serial number 126 and the entries relating thereto, the following serial number and entries shall be inserted, namely :-

(1)	(2)	(3)	(4)
"127	M/s Vardan Enviro Lab, Sector-51, Samaspur, Opposite Amity School, Gurgaon - 122001 (Haryana)	(1) Mr.S. K. Sharma (2) Mr.Rajinder Singh Yadav (3) Mr. Gaurav Pratap Singh	30.06.2015 to 29.06.2020"

[F. No. Q. 15018/23/2013-CPW]
Dr. RASHID HASAN, Advisor

Note.- The principal notification was published in the Gazette of India, Extraordinary *vide* number S.O. 1174(E), dated the 18th July, 2007 and subsequently amended *vide* notification numbers S.O. 1539(E), dated the 13th September, 2007, S.O. 1811(E), dated the 24th October, 2007, S.O. 55(E), dated 9th January, 2008, S.O. 428(E), dated the 4th March, 2008, S.O. 865(E) dated the 11th April, 2008, S.O. 1894(E) dated the 31st July, 2008, S.O. 2728(E) dated the 25th November, 2008, S.O. 1356(E) dated the 27th May, 2009, S.O. 1802(E) dated the 22nd July, 2009, S.O. 2399(E), dated the 18th September, 2009, S.O. 3122(E), dated the 7th December, 2009, S.O. 3123(E), dated the 7th December, 2009, S.O. No. 142(E), dated the 21st January, 2010, S.O. 619(E), 19th March, 2010, S.O. 1662(E) dated the 13rd July, 2010, S.O. 2390(E), dated the 30th September, 2010, S.O. 2904(E), dated the 8th December, 2010, S.O. 181(E), dated the 28th January, 2011, S.O. 692(E), dated the 5th April, 2011, S.O.1537(E), dated the 6th July,2011, S.O.1754(E), dated the 28th July, 2011 S.O. 2609 (E) dated the 22nd November, 2011, S.O. 264 (E), dated the 13 February, 2012, S.O. 1150(E), dated the 22nd May, 2012, S.O. 2039(E), dated the 5th September, 2012, S.O. 2802(E) dated the 27th November, 2012, S.O. 2850(E), dated the 7th December, 2012, S.O. 592(E), dated the 8th March, 2013, S.O. 945(E), dated the 8th April, 2013, S.O. 2287(E), dated the 27th July, 2013, S.O. 2288(E), dated the 27th July, 2013, S.O. 3489(E) dated the 26th November, 2013, S.O.21(E), dated 3rd January, 2014 and S.O. 561(E), the 26th February, 2014, S.O. 1205(E), the 5th May, 2014, S.O. 1190(E), the 2nd May, 2014, S.O. 2003(E), the 6th August, 2014 and S.O. 137(E), the 12th January, 2015.



NABL

National Accreditation Board for Testing and Calibration Laboratories

(An Autonomous Body under Department of Science & Technology, Govt. of India)

CERTIFICATE OF ACCREDITATION

VARDAN ENVIRO LAB

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2005

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

Village-Samaspur, Sector-51, Gurgaon, Haryana

in the discipline of

CHEMICAL TESTING

(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Certificate Number T-2629

Issue Date 05/08/2015



Valid Until 04/08/2017

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the additional requirements of NABL.

Signed for and on behalf of NABL

N. Venkateswaran

Anil Relia

S. K. Joshi

N. Venkateswaran
Program Manager

Anil Relia
Director

Prof. S. K. Joshi
Chairman


Regd. Off: D-142, Sushant Lok-III, Golf Course Extension Road, Sector-57, Gurgaon (Hr) Tel: 0124-4291036
 Laboratory: Samaspur, Opposite Amity School, Sector-51, Gurgaon (Hr)
 Branch Off: J-3, Subhash Marg, C-Scheme, Jaipur (Rajasthan) Tel: 0141-4026275
 (ISO 9001 | ISO 14001 | OHSAS 18001 | MoEF & CC Recognized | NABL Accredited | HSPCB & RSPCB Approved)

Test Certificate

Name & Address of the Project:	M/s Sh. Mushtaq Muzafar Anem Lime Stone Mining Project (Area-21.106 Ha), Near Village-Bathyn, Tehsil-Pampora, District-Pulwama, (Jammu & Kashmir)	Report No.:	VEL/A/MMA/1603/2159-2185
Sample Description:	Ambient Air Quality Monitoring	Reporting Date:	06/06/2016
Sample Collected by:	Vardan EnviroLab Team	Ref. No:	NIL
Location:	Project Site (A1)	Monitoring Period:	March to May 2016
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	CPCB Guidelines/IS-5182

RESULT

Date	PM10 ($\mu\text{g}/\text{m}^3$)	PM 2.5 ($\mu\text{g}/\text{m}^3$)	NO ₂ ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)
01.03.2016	56.4	28.6	23.8	9.7
02.03.2016	49.8	34.3	15.0	9.2
08.03.2016	52.1	29.5	19.9	6.3
09.03.2016	49.0	30.1	21.1	9.4
15.03.2016	52.1	33.2	16.5	7.1
16.03.2016	47.3	28.1	23.1	8.0
22.03.2016	47.4	29.0	15.4	10.4
23.03.2016	50.5	31.2	20.7	7.2
29.03.2016	55.2	34.7	20.0	8.0
30.03.2016	50.9	28.6	19.0	9.4
05.04.2016	45.4	30.7	21.1	6.3
06.04.2016	51.2	28.6	16.6	8.4
12.04.2016	48.4	33.2	18.6	9.1
13.04.2016	45.3	27.5	13.1	9.4
19.04.2016	50.8	30.2	19.5	8.7
20.04.2016	56.3	29.3	21.0	6.0
26.04.2016	49.3	24.2	19.6	9.5
27.04.2016	50.8	25.6	21.2	8.2
03.05.2016	56.0	35.2	21.3	6.3
04.05.2016	53.2	30.9	19.7	10.5
10.05.2016	59.8	27.4	22.0	9.6


(Himanshu)




NOTE: a) The results listed refer only to the tested samples & applicable parameters
 b) Total liabilities of our lab will be restricted to the invoice amount only
 c) The sample will be destroyed after retention time unless otherwise specified
 d) This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law

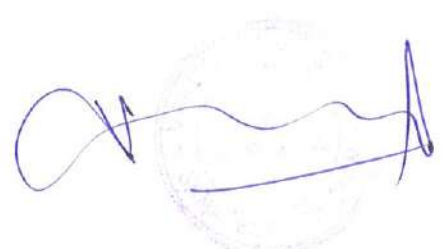
Test Certificate

Report No.:	VEL/A/MMA/1603/2159-2185			
Date	PM10 ($\mu\text{g}/\text{m}^3$)	PM 2.5 ($\mu\text{g}/\text{m}^3$)	NO ₂ ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)
11.05.2016	54.3	27.4	21.4	10.6
17.05.2016	50.9	27.1	16.8	8.5
18.05.2016	55.3	32.9	23.0	9.0
24.05.2016	49.0	28.6	21.1	8.2
25.05.2016	52.1	31.1	18.7	9.8
31.05.2016	49.7	25.3	15.1	8.4

Chemical Composition of PM 10

Date	Parameter	PM10 ($\mu\text{g}/\text{m}^3$)	Free Silica %	Ca ($\mu\text{g}/\text{m}^3$)	Mg ($\mu\text{g}/\text{m}^3$)	Ni (ng/m^3)	Pb ($\mu\text{g}/\text{m}^3$)
19.04.2016	--	50.8	2.7	0.86	0.41	<0.5	0.10


(Himanshu)



Test Certificate

Name & Address of the Project:	M/s Sh. Mushtaq Muzafar Anem Lime Stone Mining Project (Area-21.106 Ha), Near Village-Bathyn, Tehsil-Pampora, District-Pulwama, (Jammu & Kashmir)	Report No.:	VEL/A/MMA/1603/2186-2212
Sample Description:	Ambient Air Quality Monitoring	Reporting Date:	06/06/2016
Sample Collected by :	Vardan EnviroLab Team	Ref. No:	NIL
Location:	Near Village-Bathan (A2)	Monitoring Period:	March to May 2016
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	CPCB Guidelines/IS-5182

RESULT

Date	PM10 ($\mu\text{g}/\text{m}^3$)	PM 2.5 ($\mu\text{g}/\text{m}^3$)	NO ₂ ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)
01.03.2016	52.7	24.3	21.4	9.8
02.03.2016	53.0	26.9	15.8	8.3
08.03.2016	47.5	29.4	23.7	6.4
09.03.2016	50.5	30.3	17.6	7.8
15.03.2016	49.8	33.4	18.0	8.3
16.03.2016	46.4	33.2	20.5	9.4
22.03.2016	49.2	32.8	15.1	6.7
23.03.2016	51.1	25.4	19.8	9.4
29.03.2016	53.2	32.1	17.9	8.1
30.03.2016	48.9	28.4	18.6	10.5
05.04.2016	56.0	32.0	18.7	9.8
06.04.2016	52.4	33.2	17.0	8.4
12.04.2016	50.8	27.5	23.7	9.7
13.04.2016	53.2	31.1	14.0	7.3
19.04.2016	55.9	30.8	19.8	9.8
20.04.2016	50.4	26.5	23.1	7.0
26.04.2016	53.2	33.2	16.5	9.7
27.04.2016	50.8	31.2	22.2	6.1
03.05.2016	53.2	27.4	21.1	9.2
04.05.2016	51.1	31.1	19.7	10.4
10.05.2016	47.0	26.4	23.6	9.3


(Himanshu)




Test Certificate

Report No.:	VEL/A/MMA/1603/2186-2212			
Date	PM10 ($\mu\text{g}/\text{m}^3$)	PM 2.5 ($\mu\text{g}/\text{m}^3$)	NO ₂ ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)
11.05.2016	50.2	25.0	19.3	8.2
17.05.2016	47.5	29.7	21.1	10.6
18.05.2016	49.0	30.8	20.6	9.4
24.05.2016	51.2	23.6	18.7	9.2
25.05.2016	55.7	31.1	20.2	6.9
31.05.2016	50.5	27.5	22.9	8.4

Chemical Composition of PM 10

Date	Parameter	PM10 ($\mu\text{g}/\text{m}^3$)	Free Silica %	Ca ($\mu\text{g}/\text{m}^3$)	Mg ($\mu\text{g}/\text{m}^3$)	Ni (ng/m^3)	Pb ($\mu\text{g}/\text{m}^3$)
08.03.2016	--	47.5	2.3	0.74	0.28	<0.5	0.07


 (Himanshu)




Test Certificate

Name & Address of the Project:	M/s Sh. Mushtaq Muzafar Anem Lime Stone Mining Project (Area-21.106 Ha), Near Village-Bathyn, Tehsil-Pampora, District-Pulwama, (Jammu & Kashmir)	Report No.:	VEL/A/MMA/1603/2213-2238
Sample Description:	Ambient Air Quality Monitoring	Reporting Date:	06/06/2016
Sample Collected by:	Vardan EnviroLab Team	Ref. No:	NIL
Location:	Near Village-Pranigam (A3)	Monitoring Period:	March to May 2016
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	CPCB Guidelines/IS-5182

RESULT

Date	PM10 ($\mu\text{g}/\text{m}^3$)	PM 2.5 ($\mu\text{g}/\text{m}^3$)	NO ₂ ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)
03.03.2016	57.7	32.1	23.0	9.8
04.03.2016	53.5	24.6	15.1	9.1
10.03.2016	50.1	31.3	17.6	9.0
11.03.2016	56.4	29.8	14.0	6.1
17.03.2016	52.9	34.1	21.1	8.2
18.03.2016	46.5	30.8	23.6	9.5
24.03.2016	52.0	32.9	16.0	7.3
25.03.2016	49.8	25.4	19.8	9.6
31.03.2016	56.9	30.8	23.1	8.4
01.04.2016	48.3	27.6	20.8	6.3
07.04.2016	50.1	32.9	19.7	8.7
08.04.2016	46.4	26.2	21.8	9.9
14.04.2016	53.9	28.7	17.6	8.7
15.04.2016	49.5	24.9	14.3	9.4
21.04.2016	52.3	31.1	20.8	8.5
22.04.2016	50.4	32.5	19.5	7.9
28.04.2016	49.8	29.7	21.3	9.0
29.04.2016	52.4	31.2	19.8	8.7
05.05.2016	57.5	34.0	17.6	9.2
06.05.2016	49.8	32.9	24.9	7.6
12.05.2016	53.2	30.1	20.3	6.2

 (Himanshu)



Test Certificate

Report No.:	VEL/A/MMA/1603/2213-2238			
Date	PM10 ($\mu\text{g}/\text{m}^3$)	PM 2.5 ($\mu\text{g}/\text{m}^3$)	NO ₂ ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)
13.05.2016	49.3	30.9	19.8	8.4
19.05.2016	52.7	24.7	21.4	9.8
20.05.2016	55.4	25.4	17.6	7.1
26.05.2016	51.9	32.1	20.7	9.2
27.05.2016	48.7	30.2	19.4	6.1

Chemical Composition of PM 10

Date	Parameter	PM10 ($\mu\text{g}/\text{m}^3$)	Free Silica %	Ca ($\mu\text{g}/\text{m}^3$)	Mg ($\mu\text{g}/\text{m}^3$)	Ni (ng/m^3)	Pb ($\mu\text{g}/\text{m}^3$)
24.03.2016	--	52.0	1.9	0.66	0.29	<0.5	0.04


 (Himanshu)



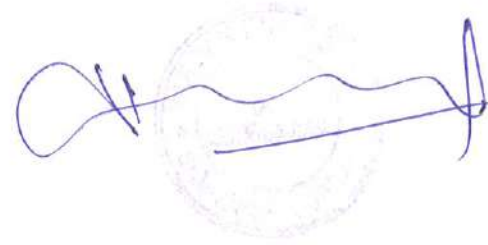
Test Certificate

Name & Address of the Project:	M/s Sh. Mushtaq Muzafar Anem Lime Stone Mining Project (Area-21.106 Ha), Near Village-Bathyn, Tehsil-Pampora, District-Pulwama, (Jammu & Kashmir)	Report No.:	VEL/A/MMA/1603/2239-2264
Sample Description:	Ambient Air Quality Monitoring	Reporting Date:	06/06/2016
Sample Collected by :	Vardan EnviroLab Team	Ref. No:	NIL
Location:	Near Village-Zinetrag (A4)	Monitoring Period:	March to May 2016
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	CPCB Guidelines/IS-5182

RESULT

Date	PM10 ($\mu\text{g}/\text{m}^3$)	PM 2.5 ($\mu\text{g}/\text{m}^3$)	NO ₂ ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)
03.03.2016	51.7	31.7	21.0	8.7
04.03.2016	53.0	32.0	23.7	9.4
10.03.2016	56.1	26.5	18.6	6.1
11.03.2016	56.0	31.2	20.5	9.1
17.03.2016	47.6	25.9	20.9	8.0
18.03.2016	53.9	30.1	23.5	7.9
24.03.2016	50.1	26.4	21.1	9.5
25.03.2016	52.9	31.1	18.4	8.6
31.03.2016	51.1	28.5	21.1	9.3
01.04.2016	54.3	31.5	16.7	9.0
07.04.2016	57.5	29.0	29.0	7.4
08.04.2016	50.2	32.7	15.3	8.9
14.04.2016	54.9	25.0	18.8	7.1
15.04.2016	48.4	28.6	22.7	7.7
21.04.2016	50.9	31.2	19.6	9.0
22.04.2016	54.3	29.8	21.9	8.4
28.04.2016	49.9	27.0	20.3	8.5
29.04.2016	53.1	24.3	17.5	9.3
05.05.2016	46.4	32.1	17.9	9.6
06.05.2016	53.0	30.4	21.5	7.5
12.05.2016	50.9	29.8	15.0	9.1


(Arman)



Test Certificate

Report No.:	VEL/A/MMA/1603/2239-2264			
Date	PM10 ($\mu\text{g}/\text{m}^3$)	PM 2.5 ($\mu\text{g}/\text{m}^3$)	NO ₂ ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)
13.05.2016	48.7	29.4	17.9	9.8
19.05.2016	52.3	31.0	14.8	7.5
20.05.2016	47.6	24.2	19.8	8.7
26.05.2016	51.5	30.8	22.0	9.4
27.05.2016	53.8	26.5	20.6	6.0

Chemical Composition of PM 10

Date	Parameter	PM10 ($\mu\text{g}/\text{m}^3$)	Free Silica %	Ca ($\mu\text{g}/\text{m}^3$)	Mg ($\mu\text{g}/\text{m}^3$)	Ni (ng/m^3)	Pb ($\mu\text{g}/\text{m}^3$)
14.04.2016	--	54.9	2.0	0.78	0.27	<0.5	0.04


 (Himanshu)



Regd. Off: D-142, Sushant Lok-III, Golf Course Extension Road, Sector-57, Gurgaon (Hr) Tel: 0124-4291036
 Laboratory: Samaspur, Opposite Amity School, Sector-51, Gurgaon (Hr)
 Branch Off: J-3, Subhash Marg, C-Scheme, Jaipur (Rajasthan) Tel: 0141-4026275
 (ISO 9001|ISO 14001|OHSAS 18001|MoEF & CC Recognized|NABL Accredited|HSPCB & RSPCB Approved)

Test Certificate

Name & Address of the Project: **M/s Sh. Mushtaq Muzafar Anem
 Lime Stone Mining Project
 (Area-21.106 Ha), Near Village-Bathyn, Tehsil-Pampora, District-Pulwama, (Jammu & Kashmir)**

Sample Description: **Ambient Air Quality Monitoring**
 Sample Collected by : **Vardan EnviroLab Team**
 Location: **Near Village-Satura (A5)**

Report No.: **VEL/A/MMA/1603/2265-2290**
 Reporting Date: **06/06/2016**
 Ref. No: **NIL**
 Monitoring Period: **March to May 2016**
 Equipment Used: **RDS & FPS with all accessories**
 Protocol Used: **CPCB Guidelines/IS-5182**

RESULT

Date	PM10 ($\mu\text{g}/\text{m}^3$)	PM 2.5 ($\mu\text{g}/\text{m}^3$)	NO ₂ ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)
05.03.2016	54.1	29.1	16.6	9.7
06.03.2016	47.7	26.4	21.3	8.6
12.03.2016	56.2	31.2	15.3	6.1
13.03.2016	54.2	25.4	22.2	7.2
19.03.2016	49.5	29.5	20.0	8.5
20.03.2016	54.4	24.2	17.2	6.3
26.03.2016	53.4	24.8	15.7	9.0
27.03.2016	50.7	28.2	22.1	9.6
02.04.2016	54.8	33.9	16.2	7.7
03.04.2016	54.5	30.3	20.6	9.9
09.04.2016	55.4	25.5	16.7	6.8
10.04.2016	50.3	29.7	20.9	9.5
16.04.2016	48.4	26.3	23.4	8.3
17.04.2016	51.3	30.5	21.1	9.0
23.04.2016	46.1	26.2	15.5	9.9
24.04.2016	49.6	32.0	22.4	6.2
30.04.2016	53.3	28.1	19.5	8.8
01.05.2016	50.1	31.7	22.1	7.5
07.05.2016	54.4	28.6	20.5	8.0
08.05.2016	49.3	32.6	15.3	7.6
14.05.2016	46.1	30.2	20.6	9.3


 (Himanshu)



NOTE: a) The results listed refer only to the tested samples & applicable parameters
 b) Total liabilities of our lab will be restricted to the invoice amount only
 c) The sample will be destroyed after retention time unless otherwise specified
 d) This report is not to be reproduced wholly or in part and cannot be used as evidence in the court of law

Regd. Off: D-142, Sushant Lok-III, Golf Course Extension Road, Sector-57, Gurgaon (Hr) Tel: 0124-4291036
 Laboratory: Samaspur, Opposite Amity School, Sector-51, Gurgaon (Hr)
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 (ISO 9001|ISO 14001|OHSAS 18001|MoEF & CC Recognized|NABL Accredited|HSPCB & RSPCB Approved)

Test Certificate

Report No.:	VEL/A/MMA/1603/2265-2290			
Date	PM10 ($\mu\text{g}/\text{m}^3$)	PM 2.5 ($\mu\text{g}/\text{m}^3$)	NO ₂ ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)
15.05.2016	59.5	30.5	23.3	9.6
21.05.2016	76.3	36.1	26.8	7.9
22.05.2016	63.8	32.4	22.2	8.9
28.05.2016	69.5	38.8	26.3	9.3
29.05.2016	73.5	33.7	22.4	6.4

Chemical Composition of PM 10

Date	Parameter	PM10 ($\mu\text{g}/\text{m}^3$)	Free Silica %	Ca ($\mu\text{g}/\text{m}^3$)	Mg ($\mu\text{g}/\text{m}^3$)	Ni (ng/m^3)	Pb ($\mu\text{g}/\text{m}^3$)
13.03.2016	--	54.2	2.1	0.71	0.35	<0.5	0.08


 (Himanshu)



NOTE: a) The results listed refer only to the tested samples & applicable parameters
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Test Certificate


Name & Address of the Project: **M/s Sh. Mushtaq Muzafar Anem
 Lime Stone Mining Project
 (Area-21.106 Ha), Near Village-Bathyn, Tehsil-Pampora,
 District-Pulwama, (Jammu & Kashmir)**

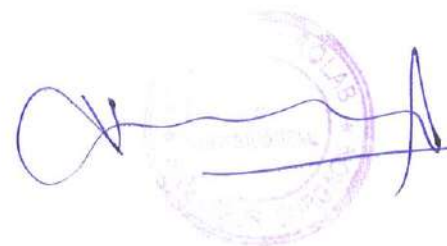
Sample Description: **Ambient Air Quality Monitoring**
 Sample Collected by : **Vardan EnviroLab Team**
 Location: **Near Village-Sata Pokhran (A6)**

Report No.: **VEL/A/MMA/1603/2291-2316**
 Reporting Date: **06/06/2016**
 Ref. No: **NIL**
 Monitoring Period: **March to May 2016**
 Equipment Used: **RDS & FPS with all accessories**
 Protocol Used: **CPCB Guidelines/IS-5182**

RESULT

Date	PM10 ($\mu\text{g}/\text{m}^3$)	PM 2.5 ($\mu\text{g}/\text{m}^3$)	NO ₂ ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)
05.03.2016	50.1	31.9	20.0	9.3
06.03.2016	54.9	28.0	21.4	10.1
12.03.2016	50.8	31.4	18.7	8.7
13.03.2016	49.8	25.5	21.0	9.3
19.03.2016	51.3	31.2	21.6	7.1
20.03.2016	49.5	31.6	22.1	9.8
26.03.2016	49.8	29.7	15.0	9.3
27.03.2016	54.7	24.8	21.1	9.0
02.04.2016	53.8	28.7	19.4	6.0
03.04.2016	50.8	30.1	16.1	7.3
09.04.2016	47.2	26.7	21.4	8.2
10.04.2016	53.2	32.1	18.9	9.9
16.04.2016	46.9	29.8	19.8	7.4
17.04.2016	50.1	25.1	19.0	9.9
23.04.2016	47.4	29.4	21.6	8.1
24.04.2016	56.3	26.3	17.8	9.0
30.04.2016	44.8	30.6	15.9	7.2
01.05.2016	47.2	26.9	21.1	9.9
07.05.2016	52.1	32.0	20.8	8.0
08.05.2016	54.1	28.7	14.2	8.1
14.05.2016	48.3	28.8	19.8	9.7


 (Himanshu)



Test Certificate

Report No.:	VEL/A/MMA/1603/2291-2316			
Date	PM10 ($\mu\text{g}/\text{m}^3$)	PM 2.5 ($\mu\text{g}/\text{m}^3$)	NO ₂ ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)
15.05.2016	48.8	25.5	21.3	8.5
21.05.2016	54.3	29.3	16.6	9.5
22.05.2016	50.3	33.1	20.4	7.4
28.05.2016	49.3	28.4	19.6	6.9
29.05.2016	47.2	32.1	16.1	9.2

Chemical Composition of PM 10

Date	Parameter	PM10 ($\mu\text{g}/\text{m}^3$)	Free Silica %	Ca ($\mu\text{g}/\text{m}^3$)	Mg ($\mu\text{g}/\text{m}^3$)	Ni (ng/m^3)	Pb ($\mu\text{g}/\text{m}^3$)
13.03.2016	--	49.8	2.4	0.76	0.36	<0.5	0.07


 (Himanshu)




Test Certificate

Name & Address of the Project:	M/s Sh. Mushtaq Muzafar Anem Lime Stone Mining Project (Area-21.106 Ha), Near Village-Bathyn, Tehsil-Pampora, District-Pulwama, (Jammu & Kashmir)	Report No.:	VEL/A/MMA/1603/2317-2342
Sample Description:	Ambient Air Quality Monitoring	Reporting Date:	06/06/2016
Sample Collected by :	Vardan EnviroLab Team	Ref. No:	NIL
Location:	Near Village-Wuyan (A7)	Monitoring Period:	March to May 2016
		Equipment Used:	RDS & FPS with all accessories
		Protocol Used:	CPCB Guidelines/IS-5182

RESULT

Date	PM10 ($\mu\text{g}/\text{m}^3$)	PM 2.5 ($\mu\text{g}/\text{m}^3$)	NO ₂ ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)
05.03.2016	52.8	27.1	17.3	9.3
06.03.2016	54.7	25.2	20.8	8.2
12.03.2016	52.3	27.9	18.2	9.8
13.03.2016	49.5	32.6	18.6	9.4
19.03.2016	52.3	24.1	21.4	6.8
20.03.2016	55.8	25.4	20.9	7.7
26.03.2016	45.4	26.9	16.6	8.3
27.03.2016	47.1	30.1	19.5	9.7
02.04.2016	49.4	25.7	16.0	6.7
03.04.2016	51.2	32.3	22.3	8.8
09.04.2016	48.5	24.6	17.4	7.2
10.04.2016	50.1	31.2	20.6	9.5
16.04.2016	46.3	27.8	16.7	8.3
17.04.2016	53.6	30.2	19.4	7.9
23.04.2016	47.4	27.8	22.4	7.5
24.04.2016	50.2	31.3	18.3	9.6
30.04.2016	46.2	32.6	20.2	8.5
01.05.2016	53.5	28.4	14.2	9.7
07.05.2016	48.1	27.9	18.6	7.4
08.05.2016	52.5	26.5	20.3	6.8
14.05.2016	46.3	28.7	21.2	8.6


(Anamshy)

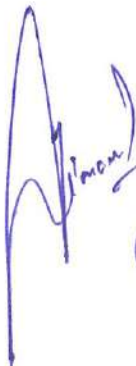

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AMITY INTERNATIONAL
SAMASPUR, GURGAON

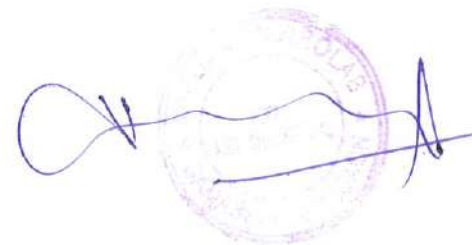
Test Certificate

Report No.:	VEL/A/MMA/1603/2317-2342			
Date	PM10 ($\mu\text{g}/\text{m}^3$)	PM 2.5 ($\mu\text{g}/\text{m}^3$)	NO ₂ ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)
15.05.2016	52.3	32.5	19.7	9.7
21.05.2016	48.9	27.8	16.5	6.8
22.05.2016	53.5	30.5	19.4	7.6
28.05.2016	51.2	29.3	13.7	9.7
29.05.2016	45.2	33.5	20.0	8.1

Chemical Composition of PM 10

Date	Parameter	PM10 ($\mu\text{g}/\text{m}^3$)	Free Silica %	Ca ($\mu\text{g}/\text{m}^3$)	Mg ($\mu\text{g}/\text{m}^3$)	Ni (ng/m^3)	Pb ($\mu\text{g}/\text{m}^3$)
17.04.2016	--	53.6	2.1	0.67	0.40	<0.5	0.05


 (Himanshu)



NATIONAL AMBIENT AIR QUALITY STANDARDS
CENTRAL POLLUTION CONTROL BOARD
NOTIFICATION

New Delhi, the 18th November, 2009

No. B-29016/20/90/PCI-I.—In exercise of the powers conferred by Sub-section (2) (h) of section 16 of the Air (Prevention and Control of Pollution) Act, 1981 (Act No.14 of 1981), and in supersession of the Notification No(s). S.O. 384(E), dated 11th April, 1994 and S.O. 935(E), dated 14th October, 1998, the Central Pollution Control Board hereby notify the National Ambient Air Quality Standards with immediate effect, namely:-

NATIONAL AMBIENT AIR QUALITY STANDARDS

S. No.	Pollutant	Time Weighted Average	Concentration in Ambient Air		
			Industrial, Residential, Rural and Other Area	Ecologically Sensitive Area (notified by Central Government)	Methods of Measurement
(1)	(2)	(3)	(4)	(5)	(6)
1	Sulphur Dioxide (SO ₂), µg/m ³	Annual* 24 hours**	50 80	20 80	- Improved West and Gaeke -Ultraviolet fluorescence
2	Nitrogen Dioxide (NO ₂), µg/m ³	Annual* 24 hours**	40 80	30 80	- Modified Jacob & Hochheiser (Na-Arsenite) - Chemiluminescence
3	Particulate Matter (size less than 10µm) or PM ₁₀ µg/m ³	Annual* 24 hours**	60 100	60 100	- Gravimetric - TOEM - Beta attenuation
4	Particulate Matter (size less than 2.5µm) or PM _{2.5} µg/m ³	Annual* 24 hours**	40 60	40 60	- Gravimetric - TOEM - Beta attenuation
5	Ozone (O ₃) µg/m ³	8 hours** 1 hour**	100 180	100 180	- UV photometric - Chemiluminescence - Chemical Method
6	Lead (Pb) µg/m ³	Annual* 24 hours**	0.50 1.0	0.50 1.0	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper - ED-XRF using Teflon filter
7	Carbon Monoxide (CO) mg/m ³	8 hours** 1 hour**	02 04	02 04	- Non Dispersive Infra Red (NDIR) spectroscopy
8	Ammonia (NH ₃) µg/m ³	Annual* 24 hours**	100 400	100 400	-Chemiluminescence -Indophenol blue method

(1)	(2)	(3)	(4)	(5)	(6)
9	Benzene (C ₆ H ₆) µg/m ³	Annual*	05	05	- Gas chromatography based continuous analyzer - Adsorption and Desorption followed by GC analysis
10	Benzo(a)Pyrene (BaP) - particulate phase only, ng/m ³	Annual*	01	01	- Solvent extraction followed by HPLC/GC analysis
11	Arsenic (As), ng/m ³	Annual*	06	06	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper
12	Nickel (Ni), ng/m ³	Annual*	20	20	- AAS /ICP method after sampling on EPM 2000 or equivalent filter paper

* Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

** 24 hourly or 08 hourly or 01 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

Note. — Whenever and wherever monitoring results on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to institute regular or continuous monitoring and further investigation.

SANT PRASAD GAUTAM, Chairman
[ADVT-III/4/184/09/Exty.]

Note: The notifications on National Ambient Air Quality Standards were published by the Central Pollution Control Board in the Gazette of India, Extraordinary vide notification No(s). S.O. 384(E), dated 11th April, 1994 and S.O. 935(E), dated 14th October, 1998.

Vardan EnviroLab

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 (ISO 9001 | ISO 14001 | OHSAS 18001 | MoEF & CC Recognized | NABL Accredited | HSPCB & RSPCB Approved)

Test Certificate

Sample Number:	VEL/MMA/W/01	Report No.:	VEL/MMA/W/1603/107
Name & Address of the Project:	M/s Sh. Mushtaq Muzafar Anem Lime Stone Mining Project (Area-21.106 Ha), Near Village-Bathyn, Tehsil-Pampora, District-Pulwama, (Jammu & Kashmir)	Format No.:	5.10 F-01
Sample Description:	Groundwater Sample	Party Reference No.:	NIL
Sampling Location:	Project Site (GW1)	Reporting Date:	14/03/2016
Sample Collected by:	Vardan EnviroLab Team	Receipt Date:	08/03/2016
Sampling & Analysis Protocol:	IS-10500-2012, APHA 22 nd Edition 2012	Sampling Date:	08/03/2016
		Sampling Type:	Grab
		Preservation:	Refrigerated
		Sampling Quantity:	2.0 Ltr

Parameter Required: As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APHA 22 nd Edition, 4500-H+ B	7.58	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 22 nd Edition, 2120 B	BDL (DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA 22 nd Edition, 2130 B	BDL (DL 1 NTU)	NTU	1	5
4.	Odour	APHA 22 nd Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 22 nd Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA 22 nd Edition, 2340 C	108.54	mg/l	200	600
7.	Calcium as Ca	APHA 22 nd Edition, 3500 Ca B	28.35	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA 22 nd Edition, 2320 B	126.00	mg/l	200	600
9.	Chloride as Cl	APHA 22 nd Edition, 4500-Cl- B	48.70	mg/l	250	1000
10.	Cyanide as CN	APHA 22 nd Edition, 4500 CN- D	BDL(DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA 22 nd Edition, 2340 B	9.19	mg/l	30	100
12.	Total Dissolved Solids	APHA 22 nd Edition, 2540 C	220.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA 22 nd Edition, 4500 E	8.26	mg/l	200	400
14.	Fluoride as F	APHA 22 nd Edition, 4500-F- D	0.29	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) 1988	4.54	mg/l	45	No Relaxation
16.	Iron as Fe	APHA 22 nd Edition, 3500-Fe B	0.18	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA 22 nd Edition, 3111 B	BDL(DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA 22 nd Edition, 4500B C	0.35	mg/l	0.5	1
19.	Chromium as Cr	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.05	No Relaxation

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Test Certificate

Sample No.: VEL/MMA/W/01			Report No.: VEL/MMA/W/1603/107			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
20.	Conductivity	APHA 22 nd Edition, 2120 B	0.368	mS/cm	--	--
21.	Phenolic Compounds	APHA 22 nd Edition, 5530 C	BDL(DL 0.001 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	BDL(DL 0.01mg/l)	mg/l	0.5	No Relaxation
23.	Anionic Detergents as MBAS	APHA 22 nd Edition, 5540 C	BDL(DL 0.02 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	APHA 22 nd Edition, 3111 B	0.50	mg/l	5	15
25.	Copper as Cu	APHA 22 nd Edition, 3111 B	0.28	mg/l	0.05	1.5
26.	Manganese as Mn	APHA 22 nd Edition, 3111 B	BDL(DL 0.10 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	APHA 22 nd Edition, 3111 B	BDL(DL 0.001 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	APHA 22 nd Edition, 3111 B	BDL(DL 0.01mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	No Relaxation
31.	Mercury as Hg	APHA 22 nd Edition, 3111 B	BDL (DL 0.001 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	<2/100ml	MPN/100ml	-	10.00
33.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Absent	Absent

Note: - *BDL-Below Detection Limit, *DL- Detection Limit

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Test Certificate

Sample Number:	VEL/MMA/W/02	Report No.:	VEL/MMA/W/1603/108
Name & Address of the Project:	M/s Sh. Mushtaq Muzafar Anem Lime Stone Mining Project (Area-21.106 Ha), Near Village-Bathyn, Tehsil-Pampora, District-Pulwama, (Jammu & Kashmir)	Format No.:	5.10 F-01
Sample Description:	Groundwater Sample	Party Reference No.:	NIL
Sampling Location:	Near Village-Bathan (GW2)	Reporting Date:	14/03/2016
Sample Collected by:	Vardan EnviroLab Team	Receipt Date:	08/03/2016
Sampling & Analysis Protocol:	IS-10500-2012, APHA 22 nd Edition 2012	Sampling Date:	08/03/2016
		Sampling Type:	Grab
		Preservation:	Refrigerated
		Sampling Quantity:	2.0 Ltr
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APHA 22 nd Edition, 4500-H* B	7.67	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 22 nd Edition, 2120 B	BDL (DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA 22 nd Edition, 2130 B	BDL (DL 1 NTU)	NTU	1	5
4.	Odour	APHA 22 nd Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 22 nd Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA 22 nd Edition, 2340 C	126.53	mg/l	200	600
7.	Calcium as Ca	APHA 22 nd Edition, 3500 Ca B	34.81	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA 22 nd Edition, 2320 B	115.19	mg/l	200	600
9.	Chloride as Cl	APHA 22 nd Edition, 4500-Cl* B	37.56	mg/l	250	1000
10.	Cyanide as CN	APHA 22 nd Edition, 4500 CN* D	BDL(DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA 22 nd Edition, 2340 B	9.64	mg/l	30	100
12.	Total Dissolved Solids	APHA 22 nd Edition, 2540 C	199.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA 22 nd Edition, 4500 E	7.59	mg/l	200	400
14.	Fluoride as F	APHA 22 nd Edition, 4500-F* D	0.27	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) 1988	4.16	mg/l	45	No Relaxation
16.	Iron as Fe	APHA 22 nd Edition, 3500-Fe B	0.16	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA 22 nd Edition, 3111 B	BDL(DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA 22 nd Edition, 4500B C	0.32	mg/l	0.5	1
19.	Chromium as Cr	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.05	No Relaxation

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Test Certificate

Sample No.: VEL/MMA/W/02			Report No.: VEL/MMA/W/1603/108			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
20.	Conductivity	APHA 22 nd Edition, 2120 B	0.335	mS/cm	--	--
21.	Phenolic Compounds	APHA 22 nd Edition, 5530 C	BDL(DL 0.001 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	BDL(DL 0.01mg/l)	mg/l	0.5	No Relaxation
23.	Anionic Detergents as MBAS	APHA 22 nd Edition, 5540 C	BDL(DL 0.02 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	APHA 22 nd Edition, 3111 B	0.58	mg/l	5	15
25.	Copper as Cu	APHA 22 nd Edition, 3111 B	0.18	mg/l	0.05	1.5
26.	Manganese as Mn	APHA 22 nd Edition, 3111 B	BDL(DL 0.10 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	APHA 22 nd Edition, 3111 B	BDL(DL 0.001 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	APHA 22 nd Edition, 3111 B	BDL(DL 0.01mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	No Relaxation
31.	Mercury as Hg	APHA 22 nd Edition, 3111 B	BDL (DL 0.001 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	<2/100ml	MPN/100ml	-	10.00
33.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Absent	Absent

Note: - *BDL-Below Detection Limit, *DL- Detection Limit

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 (ISO 9001 | ISO 14001 | OHSAS 18001 | MoEF & CC Recognized | NABL Accredited | HSPCB & RSPCB Approved)

Test Certificate

Sample Number:	VEL/MMA/W/03	Report No.:	VEL/MMA/W/1603/109
Name & Address of the Project:	M/s Sh. Mushtaq Muzafar Anem Lime Stone Mining Project (Area-21.106 Ha), Near Village-Bathyn, Tehsil-Pampora, District-Pulwama, (Jammu & Kashmir)	Format No.:	5.10 F-01
Sample Description:	Groundwater Sample	Party Reference No.:	NIL
Sampling Location:	Near Village-Pranigam (GW3)	Reporting Date:	14/03/2016
Sample Collected by:	Vardan Enviro Lab Team	Receipt Date:	08/03/2016
Sampling & Analysis Protocol:	IS-10500-2012, APHA 22 nd Edition 2012	Sampling Date:	08/03/2016
		Sampling Type:	Grab
		Preservation:	Refrigerated
		Sampling Quantity:	2.0 Ltr
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APHA 22 nd Edition, 4500-H+ B	7.48	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 22 nd Edition, 2120 B	BDL (DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA 22 nd Edition, 2130 B	BDL (DL 1 NTU)	NTU	1	5
4.	Odour	APHA 22 nd Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 22 nd Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA 22 nd Edition, 2340 C	148.67	mg/l	200	600
7.	Calcium as Ca	APHA 22 nd Edition, 3500 Ca B	32.14	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA 22 nd Edition, 2320 B	136.53	mg/l	200	600
9.	Chloride as Cl	APHA 22 nd Edition, 4500-Cl- B	48.69	mg/l	250	1000
10.	Cyanide as CN	APHA 22 nd Edition, 4500 CN- D	BDL(DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA 22 nd Edition, 2340 B	16.64	mg/l	30	100
12.	Total Dissolved Solids	APHA 22 nd Edition, 2540 C	260.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA 22 nd Edition, 4500 E	18.10	mg/l	200	400
14.	Fluoride as F	APHA 22 nd Edition, 4500-F- D	0.21	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) 1988	12.50	mg/l	45	No Relaxation
16.	Iron as Fe	APHA 22 nd Edition, 3500-Fe B	0.68	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA 22 nd Edition, 3111 B	BDL(DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA 22 nd Edition, 4500B C	0.43	mg/l	0.5	1
19.	Chromium as Cr	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.05	No Relaxation

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Regd. Off: D-142, Sushant Lok-III, Golf Course Extension Road, Sector-57, Gurgaon (Hr) Tel: 0124-4291036
 Laboratory: Samaspur, Opposite Amity School, Sector-51, Gurgaon (Hr)
 Branch Off: J-3, Subhash Marg, C-Scheme, Jaipur (Rajasthan) Tel: 0141-4026275
 (ISO 9001 | ISO 14001 | OHSAS 18001 | MoEF & CC Recognized | NABL Accredited | HSPCB & RSPCB Approved)

Test Certificate

Sample No.: VEL/MMA/W/03			Report No.: VEL/MMA/W/1603/109			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
20.	Conductivity	APHA 22 nd Edition, 2120 B	0.440	mS/cm	--	--
21.	Phenolic Compounds	APHA 22 nd Edition, 5530 C	BDL(DL 0.001 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	BDL(DL 0.01mg/l)	mg/l	0.5	No Relaxation
23.	Anionic Detergents as MBAS	APHA 22 nd Edition, 5540 C	BDL(DL 0.02 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	APHA 22 nd Edition, 3111 B	0.68	mg/l	5	15
25.	Copper as Cu	APHA 22 nd Edition, 3111 B	0.28	mg/l	0.05	1.5
26.	Manganese as Mn	APHA 22 nd Edition, 3111 B	BDL(DL 0.10 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	APHA 22 nd Edition, 3111 B	BDL(DL 0.001 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	APHA 22 nd Edition, 3111 B	BDL(DL 0.01mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	No Relaxation
31.	Mercury as Hg	APHA 22 nd Edition, 3111 B	BDL (DL 0.001 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	<2/100ml	MPN/100ml	-	10.00
33.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Absent	Absent

Note: - *BDL-Below Detection Limit, *DL- Detection Limit



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Regd. Off: D-142, Sushant Lok-III, Golf Course Extension Road, Sector-57, Gurgaon (Hr) Tel: 0124-4291036

Laboratory: Samaspur, Opposite Amity School, Sector-51, Gurgaon (Hr)

Branch Off: J-3, Subhash Marg, C-Scheme, Jaipur (Rajasthan) Tel: 0141-4026275

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Test Certificate

Sample Number:	VEL/MMA/W/04	Report No.:	VEL/MMA/W/1603/110
Name & Address of the Project:	M/s Sh. Mushtaq Muzafar Anem Lime Stone Mining Project (Area-21.106 Ha), Near Village-Bathyn, Tehsil-Pampora, District-Pulwama, (Jammu & Kashmir)	Format No.:	5.10 F-01
		Party Reference No.:	NIL
Sample Description:	Groundwater Sample	Reporting Date:	14/03/2016
Sampling Location:	Near Village-Zinetrag (GW4)	Receipt Date:	08/03/2016
Sample Collected by:	Vardan Enviro Lab Team	Sampling Date:	08/03/2016
Sampling & Analysis Protocol:	IS-10500-2012, APHA 22 nd Edition 2012	Sampling Type:	Grab
		Preservation:	Refrigerated
		Sampling Quantity:	2.0 Ltr
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APHA 22 nd Edition, 4500-H ⁺ B	7.16	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 22 nd Edition, 2120 B	BDL (DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA 22 nd Edition, 2130 B	BDL (DL 1 NTU)	NTU	1	5
4.	Odour	APHA 22 nd Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 22 nd Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA 22 nd Edition, 2340 C	101.54	mg/l	200	600
7.	Calcium as Ca	APHA 22 nd Edition, 3500 Ca B	33.38	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA 22 nd Edition, 2320 B	86.37	mg/l	200	600
9.	Chloride as Cl	APHA 22 nd Edition, 4500-Cl- B	40.44	mg/l	250	1000
10.	Cyanide as CN	APHA 22 nd Edition, 4500 CN- D	BDL(DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA 22 nd Edition, 2340 B	4.44	mg/l	30	100
12.	Total Dissolved Solids	APHA 22 nd Edition, 2540 C	207.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA 22 nd Edition, 4500 E	9.54	mg/l	200	400
14.	Fluoride as F	APHA 22 nd Edition, 4500-F- D	0.23	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) 1988	3.12	mg/l	45	No Relaxation
16.	Iron as Fe	APHA 22 nd Edition, 3500-Fe B	0.18	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA 22 nd Edition, 3111 B	BDL(DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA 22 nd Edition, 4500B C	0.36	mg/l	0.5	1
19.	Chromium as Cr	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.05	No Relaxation

Signature

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 Laboratory: Samaspur, Opposite Amity School, Sector-51, Gurgaon (Hr)
 Branch Off: J-3, Subhash Marg, C-Scheme, Jaipur (Rajasthan) Tel: 0141-4026275
 (ISO 9001 | ISO 14001 | OHSAS 18001 | MoEF & CC Recognized | NABL Accredited | HSPCB & RSPCB Approved)

Test Certificate

Sample No.: VEL/MMA/W/04			Report No.: VEL/MMA/W/1603/110			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
20.	Conductivity	APHA 22 nd Edition, 2120 B	0.348	mS/cm	--	--
21.	Phenolic Compounds	APHA 22 nd Edition, 5530 C	BDL(DL 0.001 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	BDL(DL 0.01mg/l)	mg/l	0.5	No Relaxation
23.	Anionic Detergents as MBAS	APHA 22 nd Edition, 5540 C	BDL(DL 0.02 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	APHA 22 nd Edition, 3111 B	0.75	mg/l	5	15
25.	Copper as Cu	APHA 22 nd Edition, 3111 B	0.20	mg/l	0.05	1.5
26.	Manganese as Mn	APHA 22 nd Edition, 3111 B	BDL(DL 0.10 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	APHA 22 nd Edition, 3111 B	BDL(DL 0.001 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	APHA 22 nd Edition, 3111 B	BDL(DL 0.01mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	No Relaxation
31.	Mercury as Hg	APHA 22 nd Edition, 3111 B	BDL (DL 0.001 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	<2/100ml	MPN/100ml	-	10.00
33.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Absent	Absent

Note: - *BDL-Below Detection Limit, *DL- Detection Limit

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 Laboratory: Samaspur, Opposite Amity School, Sector-51, Gurgaon (Hr)
 Branch Off: J-3, Subhash Marg, C-Scheme, Jaipur (Rajasthan) Tel: 0141-4026275
 (ISO 9001 | ISO 14001 | OHSAS 18001 | MoEF & CC Recognized | NABL Accredited | HSPCB & RSPCB Approved)

Test Certificate

Sample Number: **VEL/MMA/W/05**
 Name & Address of the Project: **M/s Sh. Mushtaq Muzafar Anem
 Lime Stone Mining Project
 (Area-21.106 Ha), Near Village-Bathyn, Tehsil-
 Pampora, District-Pulwama, (Jammu & Kashmir)**
 Sample Description: **Groundwater Sample**
 Sampling Location: **Near Village-Satura (GW5)**
 Sample Collected by: **Vardan EnviroLab Team**
 Sampling & Analysis Protocol: **IS-10500-2012, APHA 22nd Edition 2012**

Report No.: **VEL/MMA/W/1603/111**
 Format No.: **5.10 F-01**
 Party Reference No.: **NIL**
 Reporting Date: **14/03/2016**
 Receipt Date: **08/03/2016**
 Sampling Date: **08/03/2016**
 Sampling Type: **Grab**
 Preservation: **Refrigerated**
 Sampling Quantity: **2.0 Ltr**
 Parameter Required: **As per Work Order**

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APHA 22 nd Edition, 4500-H ⁺ B	7.40	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 22 nd Edition, 2120 B	BDL (DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA 22 nd Edition, 2130 B	BDL (DL 1 NTU)	NTU	1	5
4.	Odour	APHA 22 nd Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 22 nd Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA 22 nd Edition, 2340 C	120.58	mg/l	200	600
7.	Calcium as Ca	APHA 22 nd Edition, 3500 Ca B	39.49	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA 22 nd Edition, 2320 B	105.64	mg/l	200	600
9.	Chloride as Cl	APHA 22 nd Edition, 4500-Cl ⁻ B	45.62	mg/l	250	1000
10.	Cyanide as CN	APHA 22 nd Edition, 4500 CN ⁻ D	BDL(DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA 22 nd Edition, 2340 B	5.36	mg/l	30	100
12.	Total Dissolved Solids	APHA 22 nd Edition, 2540 C	380.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA 22 nd Edition, 4500 E	12.27	mg/l	200	400
14.	Fluoride as F	APHA 22 nd Edition, 4500-F ⁻ D	0.30	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) 1988	6.68	mg/l	45	No Relaxation
16.	Iron as Fe	APHA 22 nd Edition, 3500-Fe B	0.21	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA 22 nd Edition, 3111 B	BDL(DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA 22 nd Edition, 4500B C	0.42	mg/l	0.5	1
19.	Chromium as Cr	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.05	No Relaxation

Jaipur



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Regd. Off: D-142, Sushant Lok-III, Golf Course Extension Road, Sector-57, Gurgaon (Hr) Tel: 0124-4291036

Laboratory: Samaspur, Opposite Amity School, Sector-51, Gurgaon (Hr)

Branch Off: J-3, Subhash Marg, C-Scheme, Jaipur (Rajasthan) Tel: 0141-4026275

(ISO 9001 | ISO 14001 | OHSAS 18001 | MoEF & CC Recognized | NABL Accredited | HSPCB & RSPCB Approved)

Test Certificate

Sample No.: VEL/MMA/W/05			Report No.: VEL/MMA/W/1603/111			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
20.	Conductivity	APHA 22 nd Edition, 2120 B	0.640	mS/cm	--	--
21.	Phenolic Compounds	APHA 22 nd Edition, 5530 C	BDL(DL 0.001 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	BDL(DL 0.01mg/l)	mg/l	0.5	No Relaxation
23.	Anionic Detergents as MBAS	APHA 22 nd Edition, 5540 C	BDL(DL 0.02 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	APHA 22 nd Edition, 3111 B	0.26	mg/l	5	15
25.	Copper as Cu	APHA 22 nd Edition, 3111 B	0.14	mg/l	0.05	1.5
26.	Manganese as Mn	APHA 22 nd Edition, 3111 B	BDL(DL 0.10 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	APHA 22 nd Edition, 3111 B	BDL(DL 0.001 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	APHA 22 nd Edition, 3111 B	BDL(DL 0.01mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	No Relaxation
31.	Mercury as Hg	APHA 22 nd Edition, 3111 B	BDL (DL 0.001 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	<2/100ml	MPN/100ml	-	10.00
33.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Absent	Absent

Note: - *BDL-Below Detection Limit, *DL- Detection Limit

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Test Certificate

Sample Number:	VEL/MMA/W/06	Report No.:	VEL/MMA/W/1603/112
Name & Address of the Project:	M/s Sh. Mushtaq Muzafar Anem Lime Stone Mining Project (Area-21.106 Ha), Near Village-Bathyn, Tehsil-Pampora, District-Pulwama, (Jammu & Kashmir)	Format No.:	5.10 F-01
Sample Description:	Groundwater Sample	Party Reference No.:	NIL
Sampling Location:	Near Village-Sata Pokhran (GW6)	Reporting Date:	14/03/2016
Sample Collected by:	Vardan Enviro Lab Team	Receipt Date:	08/03/2016
Sampling & Analysis Protocol:	IS-10500-2012, APHA 22 nd Edition 2012	Sampling Date:	08/03/2016
		Sampling Type:	Grab
		Preservation:	Refrigerated
		Sampling Quantity:	2.0 Ltr
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APHA 22 nd Edition, 4500-H ⁺ B	7.79	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 22 nd Edition, 2120 B	BDL (DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA 22 nd Edition, 2130 B	BDL (DL 1 NTU)	NTU	1	5
4.	Odour	APHA 22 nd Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 22 nd Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA 22 nd Edition, 2340 C	128.54	mg/l	200	600
7.	Calcium as Ca	APHA 22 nd Edition, 3500 Ca B	41.47	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA 22 nd Edition, 2320 B	131.00	mg/l	200	600
9.	Chloride as Cl	APHA 22 nd Edition, 4500-Cl ⁻ B	38.92	mg/l	250	1000
10.	Cyanide as CN	APHA 22 nd Edition, 4500 CN ⁻ D	BDL(DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA 22 nd Edition, 2340 B	6.09	mg/l	30	100
12.	Total Dissolved Solids	APHA 22 nd Edition, 2540 C	310.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA 22 nd Edition, 4500 E	11.45	mg/l	200	400
14.	Fluoride as F	APHA 22 nd Edition, 4500-F ⁻ D	0.32	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) 1988	4.57	mg/l	45	No Relaxation
16.	Iron as Fe	APHA 22 nd Edition, 3500-Fe B	0.22	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA 22 nd Edition, 3111 B	BDL(DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA 22 nd Edition, 4500B C	0.30	mg/l	0.5	1
19.	Chromium as Cr	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.05	No Relaxation

Signature



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Test Certificate

Sample No.: VEL/MMA/W/06			Report No.: VEL/MMA/W/1603/112			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
20.	Conductivity	APHA 22 nd Edition, 2120 B	0.530	mS/cm	--	--
21.	Phenolic Compounds	APHA 22 nd Edition, 5530 C	BDL(DL 0.001 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	BDL(DL 0.01mg/l)	mg/l	0.5	No Relaxation
23.	Anionic Detergents as MBAS	APHA 22 nd Edition, 5540 C	BDL(DL 0.02 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	APHA 22 nd Edition, 3111 B	<0.02	mg/l	5	15
25.	Copper as Cu	APHA 22 nd Edition, 3111 B	<0.02	mg/l	0.05	1.5
26.	Manganese as Mn	APHA 22 nd Edition, 3111 B	BDL(DL 0.10 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	APHA 22 nd Edition, 3111 B	BDL(DL 0.001 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	APHA 22 nd Edition, 3111 B	BDL(DL 0.01mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	No Relaxation
31.	Mercury as Hg	APHA 22 nd Edition, 3111 B	BDL (DL 0.001 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	<2/100ml	MPN/100ml	-	10.00
33.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Absent	Absent

Note: - *BDL-Below Detection Limit, *DL- Detection Limit

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Test Certificate

Sample Number: **VEL/MMA/W/07**
 Name & Address of the Project: **M/s Sh. Mushtaq Muzafar Anem
 Lime Stone Mining Project
 (Area-21.106 Ha), Near Village-Bathyn, Tehsil-
 Pampora, District-Pulwama, (Jammu & Kashmir)**
 Sample Description: **Groundwater Sample**
 Sampling Location: **Near Village-Wuyan (GW7)**
 Sample Collected by: **Vardan EnviroLab Team**
 Sampling & Analysis Protocol: **IS-10500-2012, APHA 22nd Edition 2012**

Report No.: **VEL/MMA/W/1603/113**
 Format No.: **5.10 F-01**
 Party Reference No.: **NIL**
 Reporting Date: **14/03/2016**
 Receipt Date: **08/03/2016**
 Sampling Date: **08/03/2016**
 Sampling Type: **Grab**
 Preservation: **Refrigerated**
 Sampling Quantity: **2.0 Ltr**
 Parameter Required: **As per Work Order**

S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
1.	pH (at 25 °C)	APHA 22 nd Edition, 4500-H* B	7.52	--	6.5 to 8.5	No Relaxation
2.	Colour	APHA 22 nd Edition, 2120 B	BDL (DL 5Hazen)	Hazen	5	15
3.	Turbidity	APHA 22 nd Edition, 2130 B	BDL (DL 1 NTU)	NTU	1	5
4.	Odour	APHA 22 nd Edition, 2150 B	Agreeable	--	Agreeable	Agreeable
5.	Taste	APHA 22 nd Edition, 2160 B	Agreeable	--	Agreeable	Agreeable
6.	Total Hardness as CaCO ₃	APHA 22 nd Edition, 2340 C	168.16	mg/l	200	600
7.	Calcium as Ca	APHA 22 nd Edition, 3500 Ca B	36.25	mg/l	75	200
8.	Alkalinity as CaCO ₃	APHA 22 nd Edition, 2320 B	99.86	mg/l	200	600
9.	Chloride as Cl	APHA 22 nd Edition, 4500-Cl B	41.23	mg/l	250	1000
10.	Cyanide as CN	APHA 22 nd Edition, 4500 CN· D	BDL(DL 0.02 mg/l)	mg/l	0.05	No Relaxation
11.	Magnesium as Mg	APHA 22 nd Edition, 2340 B	18.88	mg/l	30	100
12.	Total Dissolved Solids	APHA 22 nd Edition, 2540 C	410.00	mg/l	500	2000
13.	Sulphate as SO ₄	APHA 22 nd Edition, 4500 E	9.53	mg/l	200	400
14.	Fluoride as F	APHA 22 nd Edition, 4500-F· D	0.27	mg/l	1.0	1.5
15.	Nitrate as NO ₃	IS 3025 (P-34) 1988	5.92	mg/l	45	No Relaxation
16.	Iron as Fe	APHA 22 nd Edition, 3500-Fe B	0.20	mg/l	0.3	No relaxation
17.	Aluminium as Al	APHA 22 nd Edition, 3111 B	BDL(DL 0.03 mg/l)	mg/l	0.03	0.2
18.	Boron	APHA 22 nd Edition, 4500B C	0.39	mg/l	0.5	1
19.	Chromium as Cr	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.05	No Relaxation

Signature



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Test Certificate

Sample No.: VEL/MMA/W/07			Report No.: VEL/MMA/W/1603/113			
S. No.	Parameter	Test-Method	Result	Unit	Limits of IS:10500 -2012	
					Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)
20.	Conductivity	APHA 22 nd Edition, 2120 B	0.680	mS/cm	--	--
21.	Phenolic Compounds	APHA 22 nd Edition, 5530 C	BDL(DL 0.001 mg/l)	mg/l	0.001	0.002
22.	Mineral Oil	Clause 6 of IS:3025(Part 39)	BDL(DL 0.01mg/l)	mg/l	0.5	No Relaxation
23.	Anionic Detergents as MBAS	APHA 22 nd Edition, 5540 C	BDL(DL 0.02 mg/l)	mg/l	0.2	1.0
24.	Zinc as Zn	APHA 22 nd Edition, 3111 B	0.23	mg/l	5	15
25.	Copper as Cu	APHA 22 nd Edition, 3111 B	0.08	mg/l	0.05	1.5
26.	Manganese as Mn	APHA 22 nd Edition, 3111 B	BDL(DL 0.10 mg/l)	mg/l	0.1	0.3
27.	Cadmium as Cd	APHA 22 nd Edition, 3111 B	BDL(DL 0.001 mg/l)	mg/l	0.003	No Relaxation
28.	Lead as Pb	APHA 22 nd Edition, 3111 B	BDL(DL 0.01mg/l)	mg/l	0.01	No Relaxation
29.	Selenium as Se	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	No Relaxation
30.	Arsenic as As	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l	0.01	No Relaxation
31.	Mercury as Hg	APHA 22 nd Edition, 3111 B	BDL (DL 0.001 mg/l)	mg/l	0.001	No Relaxation
32.	Total Coliform	IS 1622,1981(Reaffirmed 2003)	<2/100ml	MPN/100ml	-	10.00
33.	E. Coli	IS 1622,1981(Reaffirmed 2003)	Absent	MPN/100ml	Absent	Absent

Note: - *BDL-Below Detection Limit, *DL- Detection Limit



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Regd. Off: D-142, Sushant Lok-III, Golf Course Extension Road, Sector-57, Gurgaon (Hr) Tel: 0124-4291036
 Laboratory: Samaspur, Opposite Amity School, Sector-51, Gurgaon (Hr)
 Branch Off: J-3, Subhash Marg, C-Scheme, Jaipur (Rajasthan) Tel: 0141-4026275
 (ISO 9001|ISO 14001|OHSAS 18001|MoEF & CC Recognized|NABL Accredited|HSPCB & RSPCB Approved)

Test Certificate

Sample Number:	VEL/MMA/W/08	Report No.:	VEL/MMA/W/1603/114
Name & Address of the Project:	M/s Sh. Mushtaq Muzafar Anem Lime Stone Mining Project (Area-21.106 Ha), Near Village-Bathyn, Tehsil-Pampora, District-Pulwama, (Jammu & Kashmir)	Format No.:	5.10 F-01
		Party Reference No.:	NIL
Sample Description:	Surface water Sample	Reporting Date:	14/03/2016
Sampling Location:	Jhelam River (Up-Stream) (SW1)	Receipt Date:	08/03/2016
Sample Collected by:	Vardan EnviroLab Team	Sampling Date:	08/03/2016
Sampling & Analysis Protocol:	IS-10500-2012, APHA 22 nd Edition 2012	Sampling Type:	Composite
		Preservation:	Refrigerated
		Sampling Quantity:	2.0 Ltr
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	APHA 22nd Edition, 4500-H+B	7.98	--
2.	Colour	APHA 22nd Edition, 2120 B	BDL (DL 5Hazen)	Hazen
3.	Turbidity	APHA 22nd Edition, 2130 B	BDL (DL 1 NTU)	NTU
4.	Odour	APHA 22nd Edition, 2150 B	Agreeable	--
5.	Total Hardness as CaCO3	APHA 22nd Edition, 2340 C	116.08	mg/l
6.	Calcium as Ca	APHA 22nd Edition, 3500 Ca B	39.50	mg/l
7.	Alkalinity as CaCO3	APHA 22nd Edition, 2320 B	109.63	mg/l
8.	Chloride as Cl	APHA 22nd Edition, 4500-Cl- B	25.21	mg/l
9.	Residual free Chlorine	APHA 22nd Edition, 4500 Cl-B	BDL(DL 0.20mg/l)	mg/l
10.	Cyanide as CN	APHA 22nd Edition, 4500 CN-D	BDL(DL 0.02 mg/l)	mg/l
11.	Magnesium as Mg	APHA 22nd Edition, 2340 B	4.26	mg/l
12.	Total Dissolved Solids	APHA 22nd Edition, 2540 C	270.00	mg/l
13.	Total Suspended solids	APHA 22nd Edition, 2540 D	15.00	mg/l
14.	Dissolved Oxygen	APHA 22nd Edition, 4500	7.1	mg/l
15.	Sulphate as SO4	APHA 22nd Edition, 4500 E	11.22	mg/l
16.	Fluoride as F	APHA 22nd Edition, 4500-F- D	0.19	mg/l
17.	BOD (3 Days at 270C)	IS 3025,P-44,1999 (R- 2003)	<5.0	mg/l
18.	COD	APHA 22nd Edition, 5220 B	8.50	mg/l

Accepted



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Test Certificate

Sample No.: VEL/MMA/W/08			Report No.: VEL/MMA/W/1603/114	
S. No.	Parameter	Test-Method	Result	Unit
19.	Conductivity	APHA 22 nd Edition, 2120 B	0.452	mS/cm
20.	Nitrate as NO ₃	IS 3025 (P-34) 1988	3.93	mg/l
21.	Iron as Fe	APHA 22 nd Edition, 3500-Fe B	0.13	mg/l
22.	Aluminium as Al	APHA 22 nd Edition, 3111 B	BDL(DL 0.03 mg/l)	mg/l
23.	Boron	APHA 22 nd Edition, 4500B C	0.23	mg/l
24.	Chromium as Cr	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l
25.	Phenolic Compounds	APHA 22 nd Edition, 5530 C	BDL(DL 0.001 mg/l)	mg/l
26.	Mineral Oil	Clause 6 of IS:3025(Part 39)	BDL(DL 0.01mg/l)	mg/l
27.	Anionic Detergents as MBAS	APHA 22 nd Edition, 5540 C	BDL(DL 0.02 mg/l)	mg/l
28.	Zinc as Zn	APHA 22 nd Edition, 3111 B	0.25	mg/l
29.	Copper as Cu	APHA 22 nd Edition, 3111 B	0.05	mg/l
30.	Manganese as Mn	APHA 22 nd Edition, 3111 B	BDL(DL 0.10 mg/l)	mg/l
31.	Cadmium as Cd	APHA 22 nd Edition, 3111 B	BDL(DL 0.001 mg/l)	mg/l

Note: -*BDL-Below Detection Limit, *DL- Detection Limit

Signature



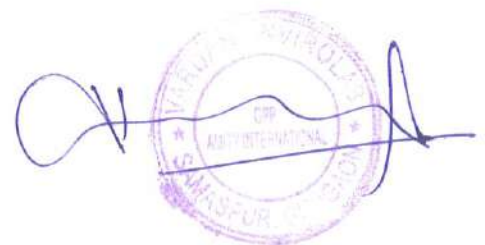
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Test Certificate

Sample Number:	VEL/MMA/W/09	Report No.:	VEL/MMA/W/1603/115
Name & Address of the Project:	M/s Sh. Mushtaq Muzafar Anem Lime Stone Mining Project (Area-21.106 Ha), Near Village-Bathyn, Tehsil-Pampora, District-Pulwama, (Jammu & Kashmir)	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	14/03/2016
		Receipt Date:	08/03/2016
Sample Description:	Surface water Sample	Sampling Date:	08/03/2016
Sampling Location:	Jhelam River (Down-Stream) (SW2)	Sampling Type:	Composite
Sample Collected by:	Vardan EnviroLab Team	Preservation:	Refrigerated
Sampling & Analysis Protocol:	IS-10500-2012, APHA 22 nd Edition 2012	Sampling Quantity:	2.0 Ltr
		Parameter Required:	As per Work Order

S. No.	Parameter	Test-Method	Result	Unit
1.	pH (at 25 0C)	APHA 22nd Edition, 4500-H+B	7.63	--
2.	Colour	APHA 22nd Edition, 2120 B	BDL (DL 5Hazen)	Hazen
3.	Turbidity	APHA 22nd Edition, 2130 B	BDL (DL 1 NTU)	NTU
4.	Odour	APHA 22nd Edition, 2150 B	Agreeable	--
5.	Total Hardness as CaCO3	APHA 22nd Edition, 2340 C	96.57	mg/l
6.	Calcium as Ca	APHA 22nd Edition, 3500 Ca B	35.39	mg/l
7.	Alkalinity as CaCO3	APHA 22nd Edition, 2320 B	89.27	mg/l
8.	Chloride as Cl	APHA 22nd Edition, 4500-Cl- B	20.64	mg/l
9.	Residual free Chlorine	APHA 22nd Edition, 4500 Cl-B	BDL(DL 0.20mg/l)	mg/l
10.	Cyanide as CN	APHA 22nd Edition, 4500 CN-D	BDL(DL 0.02 mg/l)	mg/l
11.	Magnesium as Mg	APHA 22nd Edition, 2340 B	2.01	mg/l
12.	Total Dissolved Solids	APHA 22nd Edition, 2540 C	266.00	mg/l
13.	Total Suspended solids	APHA 22nd Edition, 2540 D	13.00	mg/l
14.	Dissolved Oxygen	APHA 22nd Edition, 4500	7.3	mg/l
15.	Sulphate as SO4	APHA 22nd Edition, 4500 E	10.39	mg/l
16.	Fluoride as F	APHA 22nd Edition, 4500-F- D	0.17	mg/l
17.	BOD (3 Days at 270C)	IS 3025,P-44,1999 (R- 2003)	<5.0	mg/l
18.	COD	APHA 22nd Edition, 5220 B	8.90	mg/l

Mushtaq Muzafar Anem



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Test Certificate

Sample No.: VEL/MMA/W/09			Report No.: VEL/MMA/W/1603/115	
S. No.	Parameter	Test-Method	Result	Unit
19.	Conductivity	APHA 22 nd Edition, 2120 B	0.441	mS/cm
20.	Nitrate as NO ₃	IS 3025 (P-34) 1988	3.26	mg/l
21.	Iron as Fe	APHA 22 nd Edition, 3500-Fe B	0.11	mg/l
22.	Aluminium as Al	APHA 22 nd Edition, 3111 B	BDL(DL 0.03 mg/l)	mg/l
23.	Boron	APHA 22 nd Edition, 4500B C	0.20	mg/l
24.	Chromium as Cr	APHA 22 nd Edition, 3111 B	BDL(DL 0.01 mg/l)	mg/l
25.	Phenolic Compounds	APHA 22 nd Edition, 5530 C	BDL(DL 0.001 mg/l)	mg/l
26.	Mineral Oil	Clause 6 of IS:3025(Part 39)	BDL(DL 0.01mg/l)	mg/l
27.	Anionic Detergents as MBAS	APHA 22 nd Edition, 5540 C	BDL(DL 0.02 mg/l)	mg/l
28.	Zinc as Zn	APHA 22 nd Edition, 3111 B	0.21	mg/l
29.	Copper as Cu	APHA 22 nd Edition, 3111 B	0.04	mg/l
30.	Manganese as Mn	APHA 22 nd Edition, 3111 B	BDL(DL 0.10 mg/l)	mg/l
31.	Cadmium as Cd	APHA 22 nd Edition, 3111 B	BDL(DL 0.001 mg/l)	mg/l

Note: -*BDL-Below Detection Limit, *DL- Detection Limit

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भारतीय मानक
पीने का पानी — विशिष्टि
(दूसरा पुनरीक्षण)

Indian Standard
DRINKING WATER — SPECIFICATION
(*Second Revision*)

ICS 13.060.20

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BHADUR SHAH ZAFAR MARG
NEW DELHI 110002

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Drinking Water Sectional Committee had been approved by the Food and Agriculture Division Council.

This standard was originally published in 1983. A report prepared by the World Health Organization in cooperation with the World Bank showed that in 1975, some 1 230 million people were without safe water supplies. These appalling facts were central to the United Nations decision to declare an International Drinking Water Supply and Sanitation decade, beginning in 1981. Further, the VI Five-Year Plan of India had made a special provision for availability of safe drinking water for the masses. Therefore, the standard was formulated with the objective of assessing the quality of water resources, and to check the effectiveness of water treatment and supply by the concerned authorities.

The first revision was undertaken to take into account the up-to-date information available about the nature and effect of various contaminants as also the new techniques for identifying and determining their concentration. Based on experience gained additional requirements for alkalinity; aluminium and boron were incorporated and the permissible limits for dissolved solids, nitrate and pesticides residues modified.

As per the eleventh five year plan document of India (2007-12), there are about 2.17 lakh quality affected habitations in the country with more than half affected with excess iron, followed by fluoride, salinity, nitrate and arsenic in that order. Further, approximately, 10 million cases of diarrhoea, more than 7.2 lakh typhoid cases and 1.5 lakh viral hepatitis cases occur every year a majority of which are contributed by unclean water supply and poor sanitation. The eleventh five year plan document of India (2007-2012) recognizes dealing with the issue of water quality as a major challenge and aims at addressing water quality problems in all quality affected habitations with emphasis on community participation and awareness campaigns as well as on top most priority to water quality surveillance and monitoring by setting up of water quality testing laboratories strengthened with qualified manpower, equipments and chemicals.

The second revision was undertaken to upgrade the requirements of the standard and align with the internationally available specifications on drinking water. In this revision assistance has been derived from the following:

- a) EU Directives relating to the quality of water intended for human consumption (80/778/EEC) and Council Directive 98/83/EC.
- b) USEPA standard — National Primary Drinking Water Standard. EPA 816-F-02-013 dated July, 2002.
- c) WHO Guidelines for Drinking Water Quality. 3rd Edition Vol. 1 Recommendations, 2008.
- d) Manual on Water Supply and Treatment, third edition — revised and updated May 1999, Ministry of Urban Development, New Delhi.

This standard specifies the acceptable limits and the permissible limits in the absence of alternate source. It is recommended that the acceptable limit is to be implemented as values in excess of those mentioned under 'Acceptable' render the water not suitable. Such a value may, however, be tolerated in the absence of an alternative source. However, if the value exceeds the limits indicated under 'permissible limit in the absence of alternate source' in col 4 of Tables 1 to 4, the sources will have to be rejected.

Pesticide residues limits and test methods given in Table 5 are based on consumption pattern, persistence and available manufacturing data. The limits have been specified based on WHO guidelines, wherever available. In cases where WHO guidelines are not available, the standards available from other countries have been examined and incorporated, taking in view the Indian conditions.

In this revision, additional requirements for ammonia, chloramines, barium, molybdenum, silver, sulphide, nickel, polychlorinated biphenyls and trihalomethanes have been incorporated while the requirements for colour, turbidity, total hardness, free residual chlorine, iron, magnesium, mineral oil, boron, cadmium, total arsenic, lead, polynuclear aromatic hydrocarbons, pesticides and bacteriological requirements have been modified.

In this revision, requirement and test method for virological examination have been included. Further, requirements and test methods for cryptosporidium and giardia have also been specified.

Routine surveillance of drinking water supplies should be carried out by the relevant authorities to understand the risk of specific pathogens and to define proper control procedures. The WHO Guidelines for Drinking Water Quality, 3rd Edition, Vol. 1 may be referred for specific recommendations on using a water safety approach incorporating risk identification. Precautions/Care should be taken to prevent contamination of drinking water from chlorine resistant parasites such as cryptosporidium species and giardia.

Indian Standard

DRINKING WATER — SPECIFICATION

*(Second Revision)***1 SCOPE**

This standard prescribes the requirements and the methods of sampling and test for drinking water.

2 REFERENCES

The standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 TERMINOLOGY

For the purpose of this standard the following definition shall apply.

3.1 Drinking Water — Drinking water is water intended for human consumption for drinking and cooking purposes from any source. It includes water (treated or untreated) supplied by any means for human consumption.

4 REQUIREMENTS

Drinking water shall comply with the requirements given in Tables 1 to 4. The analysis of pesticide residues given in Table 3 shall be conducted by a recognized laboratory using internationally established test method meeting the residue limits as given in Table 5.

Drinking water shall also comply with bacteriological requirements (*see 4.1*), virological requirements (*see 4.2*) and biological requirements (*see 4.3*).

4.1 Bacteriological Requirements**4.1.1 Water in Distribution System**

Ideally, all samples taken from the distribution system including consumers' premises, should be free from coliform organisms and the following bacteriological quality of drinking water collected in the distribution system, as given in Table 6 is, therefore specified when tested in accordance with IS 1622.

4.2 Virological Requirements

4.2.1 Ideally, all samples taken from the distribution

Table 1 Organoleptic and Physical Parameters*(Foreword and Clause 4)*

SI No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to Part of IS 3025	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Colour, Hazen units, <i>Max</i>	5	15	Part 4	Extended to 15 only, if toxic substances are not suspected in absence of alternate sources
ii)	Odour	Agreeable	Agreeable	Part 5	a) Test cold and when heated b) Test at several dilutions
iii)	pH value	6.5-8.5	No relaxation	Part 11	—
iv)	Taste	Agreeable	Agreeable	Parts 7 and 8	Test to be conducted only after safety has been established
v)	Turbidity, NTU, <i>Max</i>	1	5	Part 10	—
vi)	Total dissolved solids, mg/l, <i>Max</i>	500	2 000	Part 16	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

IS 10500 : 2012

Table 2 General Parameters Concerning Substances Undesirable in Excessive Amounts
(Foreword and Clause 4)

Sl No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Method of Test, Ref to	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
i)	Aluminium (as Al), mg/l, <i>Max</i>	0.03	0.2	IS 3025 (Part 55)	—
ii)	Ammonia (as total ammonia-N), mg/l, <i>Max</i>	0.5	No relaxation	IS 3025 (Part 34)	—
iii)	Anionic detergents (as MBAS) mg/l, <i>Max</i>	0.2	1.0	Annex K of IS 13428	—
iv)	Barium (as Ba), mg/l, <i>Max</i>	0.7	No relaxation	Annex F of IS 13428* or IS 15302	—
v)	Boron (as B), mg/l, <i>Max</i>	0.5	1.0	IS 3025 (Part 57)	—
vi)	Calcium (as Ca), mg/l, <i>Max</i>	75	200	IS 3025 (Part 40)	—
vii)	Chloramines (as Cl ₂), mg/l, <i>Max</i>	4.0	No relaxation	IS 3025 (Part 26)* or APHA 4500-Cl G	—
viii)	Chloride (as Cl), mg/l, <i>Max</i>	250	1 000	IS 3025 (Part 32)	—
ix)	Copper (as Cu), mg/l, <i>Max</i>	0.05	1.5	IS 3025 (Part 42)	—
x)	Fluoride (as F) mg/l, <i>Max</i>	1.0	1.5	IS 3025 (Part 60)	—
xi)	Free residual chlorine, mg/l, <i>Min</i>	0.2	1	IS 3025 (Part 26)	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection is required, it should be minimum 0.5 mg/l
xii)	Iron (as Fe), mg/l, <i>Max</i>	0.3	No relaxation	IS 3025 (Part 53)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xiii)	Magnesium (as Mg), mg/l, <i>Max</i>	30	100	IS 3025 (Part 46)	—
xiv)	Manganese (as Mn), mg/l, <i>Max</i>	0.1	0.3	IS 3025 (Part 59)	Total concentration of manganese (as Mn) and iron (as Fe) shall not exceed 0.3 mg/l
xv)	Mineral oil, mg/l, <i>Max</i>	0.5	No relaxation	Clause 6 of IS 3025 (Part 39) Infrared partition method	—
xvi)	Nitrate (as NO ₃), mg/l, <i>Max</i>	45	No relaxation	IS 3025 (Part 34)	—
xvii)	Phenolic compounds (as C ₆ H ₅ OH), mg/l, <i>Max</i>	0.001	0.002	IS 3025 (Part 43)	—
xviii)	Selenium (as Se), mg/l, <i>Max</i>	0.01	No relaxation	IS 3025 (Part 56) or IS 15303*	—
xix)	Silver (as Ag), mg/l, <i>Max</i>	0.1	No relaxation	Annex J of IS 13428	—
xx)	Sulphate (as SO ₄) mg/l, <i>Max</i>	200	400	IS 3025 (Part 24)	May be extended to 400 provided that Magnesium does not exceed 30
xxi)	Sulphide (as H ₂ S), mg/l, <i>Max</i>	0.05	No relaxation	IS 3025 (Part 29)	—
xxii)	Total alkalinity as calcium carbonate, mg/l, <i>Max</i>	200	600	IS 3025 (Part 23)	—
xxiii)	Total hardness (as CaCO ₃), mg/l, <i>Max</i>	200	600	IS 3025 (Part 21)	—
xxiv)	Zinc (as Zn), mg/l, <i>Max</i>	5	15	IS 3025 (Part 49)	—

NOTES

1 In case of dispute, the method indicated by '*' shall be the referee method.

2 It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

Regd. Off: D-142, Sushant Lok-II, Golf Course Extension Road, Sector-57, Gurgaon (Hr) Tel: 0124-4291036

Laboratory: Samaspur, Opposite Amity School, Sector-51, Gurgaon (Hr)

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(ISO 9001 | ISO 14001 | OHSAS 18001 | MoEF & CC Recognized | NABL Accredited | HSPCB & RSPCB Approved)

Test Certificate

Sample Number:	VEL/MMA/S/01	Report No.:	VEL/MMA/S/1603/75
Name & Address of the Project:	M/s Sh. Mushtaq Muzafar Anem Lime Stone Mining Project (Area-21.106 Ha), Near Village-Bathyn, Tehsil-Pampora, District-Pulwama, (Jammu & Kashmir)	Format No.:	5.10 F-01
Sample Description:	SOIL	Party Reference No.:	NIL
Sampling Location:	Project Site (S1)	Reporting Date:	14/03/2016
Sample Collected by:	Vardan Enviro Lab Team	Receipt Date:	08/03/2016
Sampling & Analysis Protocol:	IS 2720 & USDA	Sampling Date:	08/03/2016
		Type of Sampling:	Composite
		Sampling Quantity:	2.0 Kg
		Depth of Sampling:	30 cm
		Packing Status:	Temp Sealed

S. No.	Parameter	Protocol	Result	Unit
1.	pH (at 25 °C)	IS : 2720 (P-26,1987)	7.64	--
2.	Conductivity	IS:14767-2000 Reaffirmed 2006	0.390	mS/cm
3.	Soil Texture	USDA Method, 1968	Silty Loam	--
4.	Color	USDA Method, 1968	Yellowish Brown	--
5.	Water holding capacity	USDA Method, 1968	24.19	%
6.	Bulk density	USDA Method, 1968	1.10	gm/cc
7.	Chloride as Cl	USDA Method, 1968	12.67	mg/100gm
8.	Calcium as Ca	USDA Method, 1968	24.32	mg/100gm
9.	Sodium as Na	USDA Method, 1968	28.10	mg/100gm
10.	Potassium as K	USDA Method, 1968	85.00	kg/hect.
11.	Organic Matter	IS:2720 (P-22, 1972)	0.72	%
12.	Magnesium as Mg	USDA Method, 1968	1.94	mg/100gm
13.	Available Nitrogen as N	IS:14684, 1999	198.00	kg./hect.
14.	Available Phosphorus	USDA, APHA-4500PC	34.10	kg./hect.
15.	Zinc as Zn	APHA-3030D, APHA-3111B	5.15	mg/100gm
16.	Manganese as Mn	APHA-3030D, APHA-3111B	1.00	mg/100gm
17.	Chromium as Cr	APHA-3030D, APHA-3111B	0.42	mg/100gm
18.	Lead as Pb	APHA-3030D, APHA-3111B	0.26	mg/100gm
19.	Cadmium as Cd	APHA-3030D, APHA-3111B	0.70	mg/100gm
20.	Copper as Cu	APHA-3030D, APHA-3111B	2.98	mg/100gm

Smisha
(Daya Shankar)

[Signature]
VARDAN ENVIRONET
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AMITY INTERNATIONAL
SAMASPUR GURGAON

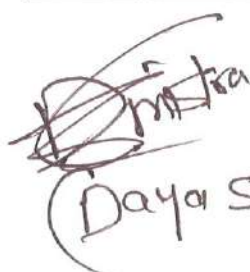
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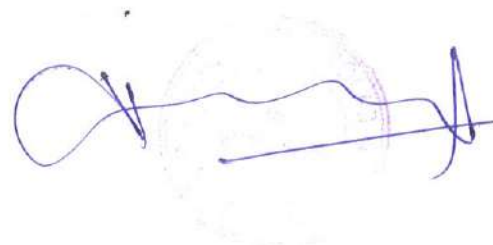
Regd. Off: D-142, Sushant Lok-III, Golf Course Extension Road, Sector-57, Gurgaon (Hr) Tel: 0124-4291036
 Laboratory: Samaspur, Opposite Amity School, Sector-51, Gurgaon (Hr)
 Branch Off: J-3, Subhash Marg, C-Scheme, Jaipur (Rajasthan) Tel: 0141-4026275
 (ISO 9001|ISO 14001|OHSAS 18001|MoEF & CC Recognized|NABL Accredited|HSPCB & RSPCB Approved)

Test Certificate

Sample Number:	VEL/MMA/S/02	Report No.:	VEL/MMA/S/1603/76
Name & Address of the Project:	M/s Sh. Mushtaq Muzafar Anem Lime Stone Mining Project (Area-21.106 Ha), Near Village-Bathyn, Tehsil-Pampora, District-Pulwama, (Jammu & Kashmir)	Format No.:	5.10 F-01
Sample Description:	SOIL	Party Reference No.:	NIL
Sampling Location:	Near Village-Zinetrag (S2)	Reporting Date:	14/03/2016
Sample Collected by:	Vardan Enviro Lab Team	Receipt Date:	08/03/2016
Sampling & Analysis Protocol:	IS 2720 & USDA	Sampling Date:	08/03/2016
		Type of Sampling:	Composite
		Sampling Quantity:	2.0 Kg
		Depth of Sampling:	30 cm
		Packing Status:	Temp Sealed

S. No.	Parameter	Protocol	Result	Unit
1.	pH (at 25 °C)	IS : 2720 (P-26,1987)	6.63	--
2.	Conductivity	IS:14767-2000 Reaffirmed 2006	0.320	mS/cm
3.	Soil Texture	USDA Method, 1968	Silty Loam	--
4.	Color	USDA Method, 1968	Yellowish Brown	--
5.	Water holding capacity	USDA Method, 1968	28.4	%
6.	Bulk density	USDA Method, 1968	1.30	gm/cc
7.	Chloride as Cl	USDA Method, 1968	28.04	mg/100gm
8.	Calcium as Ca	USDA Method, 1968	12.90	mg/100gm
9.	Sodium as Na	USDA Method, 1968	9.80	mg/100gm
10.	Potassium as K	USDA Method, 1968	90.00	kg/hect.
11.	Organic Matter	IS:2720 (P-22, 1972)	0.72	%
12.	Magnesium as Mg	USDA Method, 1968	7.02	mg/100gm
13.	Available Nitrogen as N	IS:14684, 1999	260.10	kg./hect.
14.	Available Phosphorus	USDA, APHA-4500PC	58.13	kg./hect.
15.	Zinc as Zn	APHA-3030D, APHA-3111B	3.05	mg/100gm
16.	Manganese as Mn	APHA-3030D, APHA-3111B	0.75	mg/100gm
17.	Chromium as Cr	APHA-3030D, APHA-3111B	0.42	mg/100gm
18.	Lead as Pb	APHA-3030D, APHA-3111B	0.10	mg/100gm
19.	Cadmium as Cd	APHA-3030D, APHA-3111B	0.39	mg/100gm
20.	Copper as Cu	APHA-3030D, APHA-3111B	1.19	mg/100gm


(Daya Shankar)



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Test Certificate

Sample Number:	VEL/MMA/S/03	Report No.:	VEL/MMA/S/1603/77
Name & Address of the Project:	M/s Sh. Mushtaq Muzafar Anem Lime Stone Mining Project (Area-21.106 Ha), Near Village-Bathyn, Tehsil-Pampora, District-Pulwama, (Jammu & Kashmir)	Format No.:	5.10 F-01
Sample Description:	SOIL	Party Reference No.:	NIL
Sampling Location:	Near Village-Pranigam (S4)	Reporting Date:	14/03/2016
Sample Collected by:	Vardan Enviro Lab Team	Receipt Date:	08/03/2016
Sampling & Analysis Protocol:	IS 2720 & USDA	Sampling Date:	08/03/2016
		Type of Sampling:	Composite
		Sampling Quantity:	2.0 Kg
		Depth of Sampling:	30 cm
		Packing Status:	Temp Sealed

S. No.	Parameter	Protocol	Result	Unit
1.	pH (at 25 °C)	IS : 2720 (P-26,1987)	7.66	--
2.	Conductivity	IS:14767-2000 Reaffirmed 2006	0.239	mS/cm
3.	Soil Texture	USDA Method, 1968	Sandy	--
4.	Color	USDA Method, 1968	Brownish White	--
5.	Water holding capacity	USDA Method, 1968	22.85	%
6.	Bulk density	USDA Method, 1968	1.33	gm/cc
7.	Chloride as Cl	USDA Method, 1968	20.64	mg/100gm
8.	Calcium as Ca	USDA Method, 1968	30.50	mg/100gm
9.	Sodium as Na	USDA Method, 1968	22.15	mg/100gm
10.	Potassium as K	USDA Method, 1968	76.80	kg/hect.
11.	Organic Matter	IS:2720 (P-22, 1972)	0.29	%
12.	Magnesium as Mg	USDA Method, 1968	15.14	mg/100gm
13.	Available Nitrogen as N	IS:14684, 1999	181.10	kg./hect.
14.	Available Phosphorus	USDA, APHA-4500PC	28.58	kg./hect.
15.	Zinc as Zn	APHA-3030D, APHA-3111B	3.86	mg/100gm
16.	Manganese as Mn	APHA-3030D, APHA-3111B	1.02	mg/100gm
17.	Chromium as Cr	APHA-3030D, APHA-3111B	1.10	mg/100gm
18.	Lead as Pb	APHA-3030D, APHA-3111B	0.38	mg/100gm
19.	Cadmium as Cd	APHA-3030D, APHA-3111B	1.05	mg/100gm
20.	Copper as Cu	APHA-3030D, APHA-3111B	2.90	mg/100gm

Daya Shankar
 (Daya Shankar)

[Signature]


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Test Certificate

Sample Number:	VEL/MMA/S/04	Report No.:	VEL/MMA/S/1603/78
Name & Address of the Project:	M/s Sh. Mushtaq Muzafar Anem Lime Stone Mining Project (Area-21.106 Ha), Near Village-Bathyn, Tehsil-Pampora, District-Pulwama, (Jammu & Kashmir)	Format No.:	5.10 F-01
Sample Description:	SOIL	Party Reference No.:	NIL
Sampling Location:	Near Village-Wuyan (S4)	Reporting Date:	14/03/2016
Sample Collected by:	Vardan Enviro Lab Team	Receipt Date:	08/03/2016
Sampling & Analysis Protocol:	IS 2720 & USDA	Sampling Date:	08/03/2016
		Type of Sampling:	Composite
		Sampling Quantity:	2.0 Kg
		Depth of Sampling:	30 cm
		Packing Status:	Temp Sealed

S. No.	Parameter	Protocol	Result	Unit
1.	pH (at 25 °C)	IS : 2720 (P-26,1987)	6.99	--
2.	Conductivity	IS:14767-2000 Reaffirmed 2006	0.40	mS/cm
3.	Soil Texture	USDA Method, 1968	Silty Loam	--
4.	Color	USDA Method, 1968	Yellowish Brown	--
5.	Water holding capacity	USDA Method, 1968	27.9	%
6.	Bulk density	USDA Method, 1968	1.10	gm/cc
7.	Chloride as Cl	USDA Method, 1968	36.10	mg/100gm
8.	Calcium as Ca	USDA Method, 1968	12.08	mg/100gm
9.	Sodium as Na	USDA Method, 1968	20.62	mg/100gm
10.	Potassium as K	USDA Method, 1968	78.17	kg/hect.
11.	Organic Matter	IS:2720 (P-22, 1972)	0.39	%
12.	Magnesium as Mg	USDA Method, 1968	5.41	mg/100gm
13.	Available Nitrogen as N	IS:14684, 1999	238.10	kg./hect.
14.	Available Phosphorus	USDA, APHA-4500PC	47.06	kg./hect.
15.	Zinc as Zn	APHA-3030D, APHA-3111B	5.43	mg/100gm
16.	Manganese as Mn	APHA-3030D, APHA-3111B	1.11	mg/100gm
17.	Chromium as Cr	APHA-3030D, APHA-3111B	0.53	mg/100gm
18.	Lead as Pb	APHA-3030D, APHA-3111B	0.20	mg/100gm
19.	Cadmium as Cd	APHA-3030D, APHA-3111B	0.41	mg/100gm
20.	Copper as Cu	APHA-3030D, APHA-3111B	2.22	mg/100gm

Daya Shankar
 (Daya Shankar)

[Signature]
 VARDAN ENVIRONET
 LABORATORY
 SAMASPUR, GURGAON

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Standard Soil Classification

S. NO.	PARAMETERS	CLASSIFICATION
1.	pH	<4.5 extremely acidic 4.51 – 5.0 very strong acidic 5.01 – 5.5 strongly acidic 5.51-6.0 moderately acidic 6.1 – 6.5 slightly acidic 6.51-7.3 Neutral 7.31-7.8 slightly alkaline 7.81-8.5 moderately alkaline 8.51 – 9.0 strongly alkaline >9.0 Very strongly alkaline
2.	Salinity Electrical Conductivity (mho/cm) 1 mho/cm = 640 ppm	Up to 1.0 average 1-2 harmful to germination 2-3 harmful to crops
3.	Nitrogen (kg/ha)	Up to 50 very less 51-100 less 110-150 good 151-300 better >300 sufficient
4.	Phosphorus (kg/ha)	Up to 15 very less 15 – 30 less 31-50 medium 51-65 on average sufficient 66-80 sufficient >80 more than sufficient
5.	Potassium (kg/ha)	0-120 very less 120-180 less 180-240 medium 241-300 average 301-360 better >360 more than sufficient

Vardan EnviroLab

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Test Certificate

Sample Number: **VEL/MMA/AN/01** Report No.: **VEL/MMA/N/1603/78**
 Name & Address of the Project: **M/s Sh. Mushtaq Muzafar Anem
 Lime Stone Mining Project
 (Area-21.106 Ha), Near Village-Bathyn, Tehsil-
 Pampora, District-Pulwama, (Jammu & Kashmir)** Format No.: **5.10 F-01**
 Party Reference No.: **NIL**
 Reporting Date: **14/03/2016**
 Receipt Date: **08/03/2016**

Sample Description: **AMBIENT NOISE LEVEL MONITORING**

General Information:-

Sample collected by : Vardan Enviro Lab Team
 Sampling Location : Project Site (N1)
 Instrument Used : Sound Level Meter
 Instrument Calibration Status : Calibrated
 Meteorological condition during monitoring : Clear Sky
 Date of Monitoring : 07/03/2016 to 08/03/2016
 Time of Monitoring : 06:00 AM to 06:00AM
 Surrounding Activity : Human & Vehicular Activities
 Scope of Monitoring : Regulatory Requirement
 Sampling & Analysis Protocol : CPCB Guidelines & IS-9989
 Sampling Duration : 24 Hours
 Parameter Required : As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	CPCB Guidelines/ IS 9989	65.10	54.80	dB(A)
2.	L _{min}	CPCB Guidelines/ IS 9989	50.60	39.00	dB(A)
3.	L _{eq}	CPCB Guidelines/ IS 9989	53.50	40.50	dB(A)
4.	CPCB Limits in dB(A) Leq (Industrial Area)	-	75.00	70.00	dB(A)

Smishra
 (Daya Shankar)

[Signature]
 VARDAN ENVIROLAB
 PART-1 INTERNATIONAL
 SAMASPUR GURGAON

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Test Certificate

Sample Number:	VEL/MMA/AN/02	Report No.:	VEL/MMA/N/1603/79
Name & Address of the Project:	M/s Sh. Mushtaq Muzafar Anem Lime Stone Mining Project (Area-21.106 Ha), Near Village-Bathyn, Tehsil-Pampora, District-Pulwama, (Jammu & Kashmir)	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	14/03/2016
		Receipt Date:	08/03/2016

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	: Vardan Enviro Lab Team
Sampling Location	: Near Village-Zantrag (N2)
Instrument Used	: Sound Level Meter
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 07/03/2016 to 08/03/2016
Time of Monitoring	: 06:00 AM to 06:00AM
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: CPCB Guidelines & IS-9989
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	CPCB Guidelines/ IS 9989	57.50	50.00	dB(A)
2.	L _{min}	CPCB Guidelines/ IS 9989	44.20	39.20	dB(A)
3.	L _{eq}	CPCB Guidelines/ IS 9989	50.47	41.73	dB(A)
4.	CPCB Limits in dB(A) L _{eq} (Residential Area)	-	55.00	45.00	dB(A)

Mishra
(Daya Shankar)



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Test Certificate

Sample Number:	VEL/MMA/AN/03	Report No.:	VEL/MMA/N/1603/80
Name & Address of the Project:	M/s Sh. Mushtaq Muzafar Anem Lime Stone Mining Project (Area-21.106 Ha), Near Village-Bathyn, Tehsil-Pampora, District-Pulwama, (Jammu & Kashmir)	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	14/03/2016
		Receipt Date:	08/03/2016

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	: Vardan Enviro Lab Team
Sampling Location	: Near Village-Pampore (N3)
Instrument Used	: Sound Level Meter
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 07/03/2016 to 08/03/2016
Time of Monitoring	: 06:00 AM to 06:00AM
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: CPCB Guidelines & IS-9989
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	CPCB Guidelines/ IS 9989	58.90	48.70	dB(A)
2.	L _{min}	CPCB Guidelines/ IS 9989	47.50	36.10	dB(A)
3.	L _{eq}	CPCB Guidelines/ IS 9989	53.00	41.83	dB(A)
4.	CPCB Limits in dB(A) L _{eq} (Residential Area)	-	55.00	45.00	dB(A)

(Signature)
 (Daya Shankar)

(Signature)


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Test Certificate

Sample Number:	VEL/MMA/AN/04	Report No.:	VEL/MMA/N/1603/81
Name & Address of the Project:	M/s Sh. Mushtaq Muzafar Anem Lime Stone Mining Project (Area-21.106 Ha), Near Village-Bathyn, Tehsil-Pampora, District-Pulwama, (Jammu & Kashmir)	Format No.:	5.10 F-01
		Party Reference No.:	NIL
		Reporting Date:	14/03/2016
		Receipt Date:	08/03/2016

Sample Description: AMBIENT NOISE LEVEL MONITORING

General Information:-

Sample collected by	: Vardan Enviro Lab Team
Sampling Location	: Near Village-Khani Bal (N4)
Instrument Used	: Sound Level Meter
Instrument Calibration Status	: Calibrated
Meteorological condition during monitoring	: Clear Sky
Date of Monitoring	: 07/03/2016 to 08/03/2016
Time of Monitoring	: 06:00 AM to 06:00AM
Surrounding Activity	: Human & Vehicular Activities
Scope of Monitoring	: Regulatory Requirement
Sampling & Analysis Protocol	: CPCB Guidelines & IS-9989
Sampling Duration	: 24 Hours
Parameter Required	: As per Work Order

S. No.	Parameters	Protocol	Test Result dB (A)		Unit
			Day Time (6:00 am to 10:00 pm)	Night Time (10:00 pm to 06:00 am)	
1.	L _{max}	CPCB Guidelines/ IS 9989	60.30	46.80	dB(A)
2.	L _{min}	CPCB Guidelines/ IS 9989	52.90	38.20	dB(A)
3.	L _{eq}	CPCB Guidelines/ IS 9989	53.00	42.10	dB(A)
4.	CPCB Limits in dB(A) Leq (Residential Area)	-	55.00	45.00	dB(A)

(Signature)
 (Day Shankar)

(Signature)


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SCHEDULE

(see rule 3(1) and 4(1))

Ambient Air Quality Standards in respect of Noise

Area Code	Category of Area / Zone	Limits in dB(A) Leq*	
		Day Time	Night Time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

- Note:-
1. Day time shall mean from 6.00 a.m. to 10.00 p.m.
 2. Night time shall mean from 10.00 p.m. to 6.00 a.m.
 3. Silence zone is an area comprising not less than 100 metres around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority
 4. Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

* dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

A "decibel" is a unit in which noise is measured.

"A", in dB(A) Leq, denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of the human ear.

Leq: It is an energy mean of the noise level over a specified period.

TRAFFIC STUDY

Name of the Project: Lime Stone Mine Near Village Chakdura, (Bathyn and Khrew)

Tehsil -Pampore , District- Pulwama (J& K) By Dawar Cement Pvt. Ltd.

Name of the Road: NH-1A

Date of Traffic Survey: 7-8th March; 2016 (Mon-Tue)

Up: Zantrag

Dn: Frestabal

Time	Fast Moving Vehicles								Slow Moving Vehicles				Day/ Night		
	Two Wheelers		Three Wheelers		Car/Vans		Buses		Trucks		Cycles			Cycle Rishkaw	
	Up	Dn	Up	Dn	Up	Dn	Up	Dn	Up	Dn	Up	Dn		Up	Dn
06:00-07:00 hours	20	10	10	11	25	25	15	14	20	15	6	8	-	1	Day
07:00-08:00 hours	10	12	13	10	30	31	12	10	18	15	9	7	3	2	Day
08:00-09:00 hours	15	18	10	10	42	34	10	14	25	20	10	9	4	5	Day
09:00-10:00 hours	21	23	17	25	31	39	13	13	22	19	6	4	-	1	Day
10:00-11:00 hours	24	21	15	18	34	41	18	20	24	21	7	5	-	-	Day
11:00-12:00 hours	26	27	18	13	37	38	11	10	26	27	5	2	-	-	Day
12:00-13:00 hours	24	29	14	10	49	47	17	15	24	29	5	2	-	1	Day
13:00-14:00 hours	17	19	16	11	37	40	22	25	17	19	3	-	-	-	Day
14:00-15:00 hours	20	19	22	16	30	49	25	20	25	21	4	2	1	2	Day
15:00-16:00 hours	16	18	18	11	36	52	18	17	21	18	-	-	-	-	Day
16:00-17:00 hours	19	20	12	11	29	41	12	13	27	25	5	2	-	1	Day
17:00-18:00 hours	22	21	9	9	32	55	13	14	22	21	3	4	2	2	Day
18:00-19:00 hours	20	17	12	10	40	43	15	13	20	17	10	9	1	3	Day
19:00-20:00 hours	16	18	11	10	24	30	25	23	19	18	12	13	-	-	Day
20:00-21:00 hours	19	21	13	15	32	31	12	14	19	21	6	4	2	1	Night
21:00-22:00 hours	21	17	12	14	33	35	11	9	21	18	4	6	-	-	Night
22:00-23:00 hours	18	15	10	11	36	30	8	12	18	15	1	-	-	-	Night
23:00-00:00 hours	14	16	11	9	21	29	12	10	14	16	-	-	-	-	Night
00:00-01:00 hours	10	8	11	9	28	26	15	10	16	13	-	-	-	-	Night
01:00-02:00 hours	10	11	13	10	14	11	10	13	18	19	-	-	-	-	Night
02:00-03:00 hours	12	9	10	11	12	17	13	10	12	9	-	-	-	-	Night
03:00-04:00 hours	12	10	9	10	12	17	15	11	12	10	-	-	-	-	Night
04:00-05:00 hours	12	10	12	13	12	16	10	12	12	10	-	-	-	-	Night
05:00-06:00 hours	11	12	12	11	23	27	11	13	14	12	2	1	-	-	Day
Total	409	401	310	288	699	804	343	335	466	428	98	78	13	19	14 Night
Grand Total	810		598		1503		678		894		176		32		10 Day

Name of the Project: Lime Stone Mine Near Village Chakdura, (Bathyn and Khrew)

Tehsil -Pampore , District- Pulwama (J& K) By Dawar Cement Pvt. Ltd.

Name of the Road: MDR-1

Date of Traffic Survey: 9-10th March; 2016 (Wed-Thu)

Up: Dachigam Wildlife Sanctuary

Dn: NH-1 A

Time	Fast Moving Vehicles										Slow Moving Vehicles				Day/ Night
	Two Wheelers		Three Wheelers		Car/Vans		Buses		Trucks		Cycles		Cycle Rishkaw		
	Up	Dn	Up	Dn	Up	Dn	Up	Dn	Up	Dn	Up	Dn	Up	Dn	
06:00-07:00 hours	10	8	20	22	14	15	15	10	10	8	7	8	-	1	Day
07:00-08:00 hours	12	10	23	21	18	20	13	18	9	10	10	11	6	2	Day
08:00-09:00 hours	9	13	19	27	17	17	16	23	9	13	12	14	9	5	Day
09:00-10:00 hours	16	11	18	28	19	21	19	21	16	11	18	19	-	1	Day
10:00-11:00 hours	13	13	15	25	16	19	13	13	13	7	15	10	-	-	Day
11:00-12:00 hours	12	17	14	23	18	16	12	17	12	17	18	13	-	-	Day
12:00-13:00 hours	12	17	12	20	12	14	12	17	12	17	21	22	-	1	Day
13:00-14:00 hours	13	10	21	22	13	15	13	10	13	10	23	25	-	-	Day
14:00-15:00 hours	16	10	13	26	20	14	16	10	11	10	16	10	1	2	Day
15:00-16:00 hours	10	12	17	26	14	13	10	12	10	8	-	-	-	-	Day
16:00-17:00 hours	13	9	21	42	12	20	13	9	13	9	25	21	-	1	Day
17:00-18:00 hours	7	8	24	41	14	12	15	17	7	8	23	14	5	8	Day
18:00-19:00 hours	11	11	38	46	20	23	11	11	11	11	14	9	3	6	Day
19:00-20:00 hours	10	9	25	42	13	14	10	9	10	9	12	13	-	-	Day
20:00-21:00 hours	11	9	19	38	19	17	11	9	11	9	6	4	2	1	Night
21:00-22:00 hours	15	10	17	32	12	10	15	10	9	10	4	6	-	-	Night
22:00-23:00 hours	10	11	21	25	11	12	10	11	10	11	1	-	-	-	Night
23:00-00:00 hours	9	13	15	22	17	18	9	13	9	13	-	-	-	-	Night
00:00-01:00 hours	17	17	10	9	12	10	17	17	17	10	-	-	-	-	Night
01:00-02:00 hours	11	8	13	11	12	8	11	8	11	8	-	-	-	-	Night
02:00-03:00 hours	10	12	18	15	13	9	10	12	10	12	-	-	-	-	Night
03:00-04:00 hours	9	11	14	12	10	8	11	11	9	11	-	-	-	-	Night
04:00-05:00 hours	7	8	10	7	13	15	10	8	7	8	-	-	-	-	Night
05:00-06:00 hours	7	9	23	21	11	12	7	9	7	9	2	1	-	-	Day
Total	270	266	440	603	350	352	299	305	256	249	227	200	26	28	14 Night
Grand Total	536		1043		702		604		505		427		54		10 Day

SUMMARIZED DEMOGRAPHIC STRUCTURE OF THE STUDY AREA

Sr.No.	Parameter	Study Area	Pulwama District
1.	No. of Villages	29	329
2.	Household	7512	85845
3.	Household Ratio	6.3	6.5
4.	Total Population	47698	560440
5.	Male Population %	25288(53.01)	293064(52.29)
6.	Female Population %	22410(46.98)	267376(47.70)
7.	Population (0-6 Years.)%	7276(15.25)	N.A
8.	Sex Ratio	886	912
9.	Scheduled Caste %	Nil	402(0.07)
10.	Scheduled Tribes %	4902(10.27)	22607(4.03)
11.	Literates %	24691(51.76)	293958(63.48)
12.	Main Workers %	9041(18.95)	188420(33.62)
13.	i) Cultivators %	852(9.42)	49746(26.40)
14.	ii) Agricultural Laborers %	557(6.16)	34080(18.09)
15.	iii) Household Laborers %	383(4.23)	10615(5.63)
16.	iv) Other Workers %	7249(80.17)	93979(49.88)
17.	Marginal Workers %	10380(21.76)	90114(16.08)
18.	Non-Workers %	28277(59.28)	372020(66.38)

Source: PCA Census 2011, Pulwama District, Jammu & Kashmir

DEMOGRAPHIC STRUCTURE OF THE STUDY AREA

Sr.No.	Villages	Households	Total Population	Population (0-6 Years)	Scheduled Tribes	Literates
Jammu And Kashmir						
Pulwama District						
Pampore Tehsil						
1.	Bathon	130	862	129	91	412
2.	Nagander	64	351	83	0	158

Lime Stone Mine (Mine Lease Area 21.106 Ha.) Near Village Chakdura, (Bathyn and Khrew),
Tehsil -Pampore , District- Pulwama (Jammu and Kashmir) By Dawar Cement Pvt. Ltd.

3.	Zinetrag	117	616	86	0	343
4.	Sata Pokhran	216	1342	309	183	540
5.	Woyan	932	5874	760	0	3279
6.	Moni Pora	137	983	118	0	467
7.	Krancho	119	783	167	0	396
8.	Khani Bal	358	2486	357	0	1363
9.	Dusoo	109	778	149	0	447
10.	Androsa	166	1058	123	0	573
11.	Gund Bal	89	616	119	0	371
12.	Shar-I- Shali	853	6178	857	337	3342
13.	Mundak Pal	203	1256	197	238	619
14.	Ledhu	823	4604	667	259	2572
15.	Chanda Haro	520	3551	711	0	1987
16.	Pad Gam Pora	240	1420	208	20	688
17.	Danger Pora	190	1272	166	0	658
18.	Pranigam	154	870	184	803	119
19.	Gulistan	51	316	43	17	154
20.	Hajinar Nor	71	348	95	346	46
21.	Sotura	531	2920	509	832	1234
22.	Gotru	232	1148	228	496	459
23.	Nigistan	232	1356	238	486	494
24.	Khana Gund	270	1588	177	0	916
25.	Jawahir Pora (Lam)	248	1307	234	460	539
26.	Deedar Pora (Gotengu)	63	355	41	188	118
27.	Dar Gani Gund	164	1030	141	0	575
28.	Heewan (Yangwani)	48	288	63	145	93
29.	Aripal	182	2142	117	1	1729
Total		7512	47698	7276	4902	24691

Source: PCA Census 2011, Pulwama District, Jammu & Kashmir

OCCUPATIONAL STRUCTURE OF THE STUDY AREA

Sr.No.	Villages	Total Main Workers	Main Workers				Marginal Workers	Non-Workers
			Cultivators	Agricultural Laborers	Household Laborers	Other Workers		
Jammu & Kashmir								
Pulwama District								
Pampore Tehsil								
1.	Bathon	75	5	1	0	69	480	307
2.	Nagander	48	2	2	0	44	174	129
3.	Zinetrag	142	4	1	3	134	238	236
4.	Sata Pokhran	187	40	4	28	115	545	610
5.	Woyan	1103	62	15	16	1010	730	4041
6.	Moni Pora	146	20	24	14	88	199	638
7.	Krancho	118	65	11	1	41	121	544
8.	Khani Bal	641	140	64	183	254	261	1584
9.	Dusoo	122	50	1	0	71	362	294
10.	Androsa	251	52	24	2	173	416	391
11.	Gund Bal	66	2	1	0	63	231	319

Lime Stone Mine (Mine Lease Area 21.106 Ha.) Near Village Chakdura, (Bathyn and Khrew),
Tehsil -Pampore , District- Pulwama (Jammu and Kashmir) By Dawar Cement Pvt. Ltd.

12.	Shar-I- Shali	1808	32	34	33	1709	893	3477
13.	Mundak Pal	306	6	0	19	281	205	745
14.	Ledhu	739	116	121	30	472	600	3265
15.	Chanda Haro	545	77	15	12	441	742	2264
16.	Pad Gam Pora	288	7	69	4	208	84	1048
17.	Danger Pora	264	8	37	0	219	51	957
18.	Pranigam	10	1	0	0	9	270	590
19.	Gulistan	21	1	0	3	17	68	227
20.	Hajinar Nor	1	0	0	0	1	99	248
21.	Sotura	225	78	10	9	128	933	1762
22.	Gotru	56	7	22	4	23	404	688
23.	Nigistan	173	48	59	0	66	345	838
24.	Khana Gund	168	0	2	10	156	670	750
25.	Jawahir Pora (Lam)	105	7	17	3	78	557	645
26.	Deedar Pora (Gotengu)	40	13	17	4	6	65	250
27.	Dar Gani Gund	107	5	3	2	97	314	609
28.	Heewan (Yangwani)	5	0	0	0	5	91	192
29.	Aripal	1281	4	3	3	1271	232	629
Total		9041	852	557	383	7249	10380	28277

E-mail:-arco_dcpl@yahoo.com

PHONE NO.:- 0194-2310458



DAWAR CEMENTS PRIVATE LIMITED

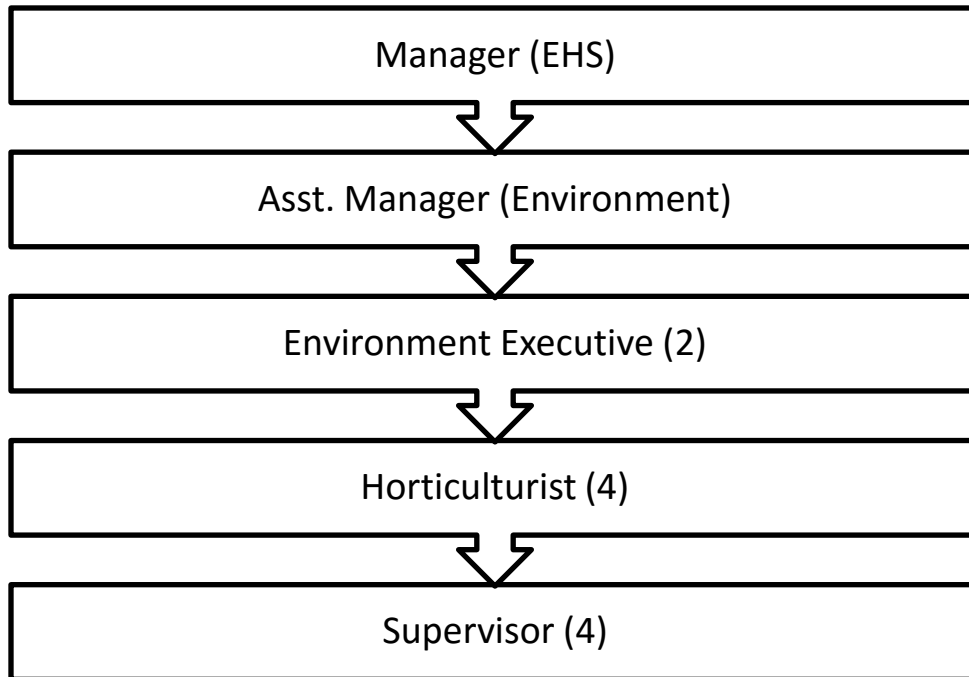
Environmental Policy

M/s Dawar Cement Pvt. Ltd. District Pulwama (Jammu and Kashmir) acknowledges its responsibility to manage the environmental effects associated with the operation of Lime stone Minor Mineral Mining at Chakdura, (Bathyn,Khrew), Pulwama (Jammu and Kashmir); as we pursue our goal of generating value for our employees and our local communities.

Implementation:

- Comply with applicable environmental laws and regulations at all time; at all locations and at all stages of exploration, development, operations and reclamation.
- Establish and maintain standards, procedures and management controls to ensure that environmental considerations are balanced equally with competing priorities and other key business activities.
- Ensure that all employees and contractors are trained to understand their environmental responsibilities and create an environment that adheres to the Company's Policies, procedures and applicable regulations.
- Hold leadership accountable for good environment performance of our operations and projects. Inherent in that accountability will be the commitment of senior management to provide resources and successfully create an appropriate environment.
- Reward and recognize behavior that supports environmental stewardship.
- Implement procedures to measure environmental performance, including regular inspection by our consultancy to verify compliance with all the applicable regulations.
- Communicate openly with employees, regulatory agencies, the public and shareholders on environmental issues.
- Work proactively with other mining companies, policy makers and the public to define environmental priorities and to contribute to the development of responsible laws and regulations to protect the environment.
- Actively engage with credible third parties to develop continuous improvement in our environmental policies and practices.
- Continuously review environmental achievements and technologies to share and promote implementation of best practices.
- The system of reporting of Non-conformances/ violation of any Environmental Law/Policy will be as per quality management system. The internal audit will be conducted on periodic basis and any Non-conformances/ violation to Environmental Law/Policy will be closed and discussed during Management Review Meetings of board of directors/partners.

Hierarchy of Environment for dealing Environmental Issues



For M/s Dawar Cement Pvt. Ltd.

(Authorized Signatory)

DAWAR CEMENTS PVT. LTD.

Head Office: Arco House, Alochibagh, Srinagar (Kashmir), India
Mob: 09596255370

To,
Hon'ble Minister Environment, Forest and Climate Change
Indira Paryavaran Bhawan, JorBagh
New Delhi-1100003

Date: 19.09.2016

Sub: Exemption from Public Hearing for Lime Stone mining with Production capacity of 53,000 TPA (ROM) by M/s Dawar Cements over an Area 21.106 Ha at Village-Chakdura, (Bathyn and Khrew), Tehsil -Pampore, District-Pulwama (Jammu and Kashmir)- Environmental Clearance Reg.

Ref. ToR letter F.No. J-11015/324/2013-IA.II (M) (Pt) dated 22nd January 2016.


Dear Sir,

The ToR was granted to Lime Stone Mining by M/s Dawar Cements Pvt. Ltd. over an Area 21.106 Ha. with Production Capacity 53,000 TPA (ROM) at Village-Chakdura, (Bathyn and Khrew), Tehsil -Pampore, District-Pulwama (Jammu and Kashmir) Letter No. F.No. J-11015/324/2013-IA.II (M) (Pt) dated 22nd January 2016.

We have hired an Environmental Consultant for EIA Studies and other formalities as per EIA notification 2006. Our EIA consultant has prepared EIA/EMP considering the study period of March to May 2016. In the month of July, we have tried to submit EIA/EMP for public hearing but due to continuous Curfew, all the Govt. offices are closed and even till date. The Law and order of entire Srinagar Region is in very horrible situation. Under these circumstances, the public hearing is not possible. Even our lives are also in danger due to militant activities.

Taking into consideration of all these worst situations and Curfew here in Srinagar, we are requesting you to please exempt us from public hearing so that we can submit our Final EIA/EMP for the grant of Environmental Clearance.

Thanking you


Sh. Mushtaq Muzaffar Anim
S/o Hajl Mohd. Muzaffar Anim

Copy to:

1. Secretary, Environment, Forest and Climate Change
2. Additional Secretary, Environment, Forest and Climate Change
3. Joint Secretary, Environment, Forest and Climate Change
4. Director (Non-Coal Mining), Environment, Forest and Climate Change

O/o JS (GB)
Dy. No. 2105
Date... 26/9/16

2105/30180
26/9/16

Mos (IC) EF & CC
Dak Dy. NO. 502
Dak No. 259
Dak OUT Date... 26/9/16

F.No. J-11015/324 /2013-IA-II (M)(Pt.)
 Government of India
 Ministry of Environment, Forests & Climate Change
 (IA Division)

Indira Paryavaran Bhawan,
 Jor Bagh Road, Aliganj,
 New Delhi – 110 003
 Dated: 3rd November, 2016.

To

The Chairman
 Jammu & Kashmir State Pollution Control Board
 Parivesh Bhawan, Forest Complex, Gladni, Narwal,
 Transport Nagar, Jammu (J&K)

Subject: Request for exemption from Public Consultations for Lime Stone mining with Production capacity of 53,055 TPA (ROM) by M/s Dawar Cements over an Area 21.106 Ha at Village – Chakdura, (Bathyn and Khrew), Tehsil – Pampore, District Pulwama(Jammu and Kashmir)- environmental clearance – Reg.

Ref: 1) MoEF & CC's letter No.J-11015/324/2013-IA.II(M)(Pt) dated 22.01.2016.
 2) MoEF & CC's letter No.J-11015/324/2013-IA.II(M)(Pt) dated 14.09.2016.

Sir,

It is to inform you that Terms of Reference(TOR) was granted by the MoEFCC to M/s Dawar Cement Pvt. Ltd., village-Chakdura(Bathyn and Khrew), Tehsil-Pampore, District-Pulwama(J & K) for lime stone mining with production capacity of 53,000 TPA(ROM) in 21.106 hectare of mine lease area vide letter at (1) above. TOR was further amended for production capacity enhancement from 50,000 TPA(ROM) to 53,055 TPA(ROM) vide amendment letter at(2) above.

2. It is informed by the project proponent that EIA/EMP reports have been prepared by them and in the month of July, 2016, the project proponent tried to submit EIA/EMP reports for Public consultations but due to continuous curfew all Govt. offices are closed. It is further informed that law and order situation in Jammu & Kashmir is not conducive and the Public consultation is not possible. A letter received from M/s Dawar Cement Pvt. Ltd. , Srinagar(J & K) dated 19.09.2016 is enclosed for your ready reference.
3. The Project proponent has requested for exempting their project proposal from conducting the Public Consultations.
4. The aforesaid case has been examined in the Ministry and it has been decided to conduct a public consultation through State Pollution Control Board, Jammu and Kashmir. Accordingly you may approach D.C, Pulwama for conducting the Public consultations. In case, due to prevailing scenario, it is not possible to conduct the Public consultation, the same may please be intimated to this Ministry through District Collector concerned for further consideration.
5. An immediate action is requested.

Yours faithfully,

(Surendra Kumar)
 Director(IA)
 Telefax. No.011-24695304
 Email:s.kumar1958@gov.in

Encl as above:

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- Copy to: 1. District Collector, Pulwama district, Pulwama, Jammu & Kashmir for necessary action.
2. ✓ The Proprietor, M/s Dawar Cement Pvt. Ltd., Arco House, Alochi Bagh, Srinagar(Kashmir), India for information and necessary action.


(Surendra Kumar)
Director(IA)



Jammu & Kashmir

OFFICE OF THE DISTRICT COLLECTOR PULWAMA

Email ID: dycompulwama@gmail.com

Dealing Section: ARA Section

Telephone No: 01933-24124

Fax No: 01933-241306

1. The Director (IA),
Ministry of Environment, Forests and Climate Change,
Indira Paryayaran Bhawan Jor Bagh Road, Ali Ganj,
New Delhi.
2. Member Secretary J&K State Pollution Control Board, Jammu

No: DEP/PA/16/1330-31Dated: 28-11-2016

Subject: Request for exemption from public consultations for Lime Stone with production capacity of 53055 TPA (ROM) by M/S Dawar Cements over an area 21.106 Ha at village Checkdoora (Bathen and Khrew) Tehsil Pampore District Pulwama- Environment Clearance regarding.

- Reference:** i. Director (IA)'s letter No. J-11015/324/2013-IA-II (M) (Pt.) Dated: 03 Nov. 2016
- ii. Member Secretary J&K State Pollution Control Board's Letter No. SPCB/T/C/1607-08; Dated: 18-11-2016

Sir,

With regard to the subject & reference captioned above, it is to inform that in light of the reports submitted by the Sr. Suptd. of Police Awantipora vide his No. CS/Comments/2016/4594 dated: 26-11-2016 and the Assistant Collector / Executive Magistrate^{1st} Class Pampore vide his Office No. TP-OQ/751 dated 26-11-2016, it is not possible/ feasible to conduct the said public hearing/ Consultation in so far as current Law and Order scenario of the Valley is concerned.

Yours Faithfully


 District Collector
 Pulwama



Government of Jammu and Kashmir
State Pollution Control Board
Parivesh Bhawan Gladni Transport Nagar
Jammu.

Shri Surinder Kumar
Director (S)
Government of India
Ministry of Environment, Forest and Climate Change
Impact Assessment Division
Indira Paryavaran Bhavan
Vayu Wing, 3rd Floor, Aliganj,
Jor Bagh Road, New Delhi -110 003.

No.: SPCB/7/429/105

Dated: 26-04-2017

Subject :- Lime stone Mining with production capacity of 53, 055 TPA located at Chakdura, Khrew, Tehsil Pampore, District Pulwama, J&K by M/S Dawar Cements Pvt. Ltd. (Mining Lease Area-21.06 Ha.) - information/clarification.


Sir,

Kindly take reference to your letter No. Nil dated 05th April, 2017 regarding above noted subject. In this behalf the Summary of major issues raised by stake holders in respect of proposal of M/S Dawar Cements (P) Ltd. are enclosed for further necessary action at your end.

It may be valuable to say that representations received for and against the project, in response to public consultation notice do not highlight issues objectively. In addition the letter of Deputy Commissioner Pulwama dated 15-02-2017 may also be kept in mind in the matter while dealing with the matter.

Yours faithfully,

Encl.

 26/4/17
Member Secretary.

SUMMARY OF ISSUES RAISED BY STAKE HOLDERS AGAINST THE PROJECT:

AUQUAF:

- Most of the cement plants including Dawar Cements failed to install pollution control devices.
- Saffron land has been adversely effected by cement plants.

MR. N.A. MALIK ADVOCATE:

- Apprehension of damage to habitants and live stock due to blasting.
- Lease has not been properly granted and no Environmental Clearance has been obtained.
- TORs approved in 2014 and going for public consultation so belately is questionable.
- Legal course has not been followed just to accommodate the owner at the cost of Environment and human life.

3 CIVIL SOCIETY KHREW:

- Deforestation in the area has been carried out thereby posing threat to Environment and Wild Life.
- Allowing mining is against forest guidelines 2009 of Ministry of Environment and Forest, Government of India.

4 ZAMINDARAN ASWSOCIATION KHREW:

- Apprehension of damage to humans and live stock.

5 AUQUAF COMMITTEE HALQA NAGANDAR:

- Environment friendly and developmental activities are welcome.
- P.H. should be conducted, & exemption is not advisable as many issues will remain unaddressed.

SUMMARY OF ISSUES RAISED BY STAKE HOLDER IN FAVOUR OF THE PROJECT :-

- 1 Javeed Ahmad R/o Pakharbal New Colony 6 Project will generate employment and will result in economic up-liftment of the area. Lease holder has committed to contribute as per CSR.
- 2 Farooq Ahmad Shiekh and Ors. R/o Pakharbal New Colony 7 Project will generate employment and will result in economic up-liftment of the area. The lease holder has committed that he will contribute to the society of adjoining village in terms of health & education sectors.
- 3 Bilal Akbar Sheikh S/o Mohd. Akber Sheikh R/o Khrew 8 Project will generate employment and will result in economic up-liftment of the area.
- 4 Manzoor Ahmad Lone, R/o Bathen 9 Project will generate employment and will result in economic up-liftment of the area. The lease holder has been maintaining healthy relations with all the Zamindars of vicinity.
- 5 Mohd. Yousuf Lone R/o Bathen 10 Project will generate employment and will result in economic up-liftment of the area. Company has always remained eco-friendly and has contributed in terms of donation for the education of poor people of our village.
- 6 Fayaz Ahmad Lone, R/o Bathen 11 Project will generate employment and will result in economic up-liftment of the area. The lease owners have taken initiative for macdaminization of roads leading to mining site. The Zaminadars in & around will earn their livelihood because of this project.
- 7 Mohd. Yousuf Lone R/o Bathen Project will generate employment and will result in economic up-liftment of the area.
- 8 Nazir Ahmad Mir R/o Bathen Project will generate employment and will result in economic up-liftment of the area.
- 9 Mohd. Ayub Lone , R/o Bathen Project will generate employment and will result in economic up-liftment of the area.
- 10 Gh. Rasool Shah, R/o Bathen Project will generate employment and will result in economic up-liftment of the area. The project will also help in social development as lease holders have taken initiative of tube well connection which will supply drinking water to adjoining villages, & will also serve the purpose of irrigation to the fields of Zamindars of area.
- 11 Mohd. Afzal Shah, R/o Bathen Project will generate employment and will result in economic up-liftment of the area.
- 12 Nazir Ahmad Lone, R/o Bathen Project will generate employment and will result in economic up-liftment of the area.
- 13 Manzoor Shahora, R/o Bathen Project will generate employment and will result in economic up-liftment of the area.
- 14 Farooq Ahmad Lone, R/o Bathen Project will generate employment and will result in economic up-liftment of the area.

- | | | |
|----|---|---|
| 15 | Mohd. Afzal Lone, R/o Nagand | result in economic up-liftment of the area. Project will generate employment and will result in economic up-liftment of the area. |
| 16 | Abdul Rashid Lone, R/o Nagand, Mohd. Iqbal Sheikh R/oNagan/ Hilal Ahmad Sheikh R/o Wagund | Project will generate employment and will result in economic up-liftment of the area. |
| 17 | Farooq Ahmad Bhat R/o Kharpora | Project will generate employment and will result in economic up-liftment of the area. The company always works for the socio-economic development of village. It has made assurances that it will take all measures with regard to safety of workers as per labour Act. |
| 18 | Bilal Ahmad Bhat, R/o Zantrang | Project will generate employment and will result in economic up-liftment of the area. |
| 19 | Nisar Ahmad Ganai, R/o Zantrang | Project will generate employment and will result in economic up-liftment of the area. |
| 20 | Sajad Shafi Teli, R/o Kharpora | Project will generate employment and will result in economic up-liftment of the area. |
| 21 | Alif Din Kaka, R/o Bajandi | Project will generate employment and will result in economic up-liftment of the area. |
| 22 | Azad Contractors Association Khrew | Association has no objection, project will prove beneficial for all. |
| 23 | Farooq Ahmad Shah, R/o Nagandar | Project will generate employment and will result in economic up-liftment of the area. |
| 24 | Muneer Ashraf, R/o Nagandar | Project will generate employment and will result in economic up-liftment of the area. |
| 25 | Bashir Ahmad Mir, R/o Nagandar | Project will generate employment and will result in economic up-liftment of the area. |
| 26 | Youth Welfare Committee Khrew Pampore Kashmir | Industry has good relations with locals, it provides jobs, company is help full and it shall benefit all. |
| 27 | TCI Max Cement Khrew | Issues addressed objections raised against the project are withdrawn and issues shall find redressal in Environmental Clearance conditions. |
| 28 | Youth Co-ordination Committee Halqa Bathen Khrew | Project will generate employment and will result in economic up-liftment of the area. |
| 29 | Citizen Forum Khrew Pampore Kashmir | Project will result in socio economic development, company has good public relations |
| 30 | Farooz Ahmad Sheikh R/o Phakarbal New Colony Khrew | Project will generate employment and will result in economic up-liftment of the area. The lease holders has committed in principle to take care of workers health & others benefits. So, there is 'No-objection' |
| 31 | M/S Valley Woven sacks, Khrew Pampore. | Project will generate employment and will result in economic up-liftment of the area. |