FINAL EIA REPORT

for the proposed

MINOR MINERAL (River Bed Material) Project at

Block No. 5/9, (Area- 9.52 ha.), Khatharwalli Khad

Downstream Manoh Khathar Bridge,

Village- Khathar, Tehsil- Akhnoor, District- Jammu, State-

J&K Approved Production- 86,100 MT/annum

Forest land- Nil

PROJECT PROPONENT

Shri Sanchit Gautam S/o Sh. Ravi Gautam

R/o Nagrota Near Toll Post Jammu

Jammu, State: J & K

PREPARED BY

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LIST OF SYMBOLS, UNITS & ABBREVIATIONS

%	Percent
$^{\circ}C$	Degree Celsius
$\mu g/m^3$	Microgram per meter cube A
AGR	Average Annual Growth Rate
AMSL	Average Mean Sea Level
APHA	American Public Health Association
BGL	Below ground level
BIS	Bureau of Indian Standards
BOD	Biochemical Oxygen Demand
BOD_5	BOD after 5 days of incubation period
BGL	Below Ground Level
CO	Carbon mono oxide
COD	Chemical Oxygen Demand
CPCB	Central Pollution Control Board
dB	Decibel
DG Set	Diesel Generator Set
DM	District Magistrate
DO	Dissolved Oxygen
EC	Electrical Conductivity
EC	Environmental Clearance
EIA	Environmental Impact Assessment
EMP	Environment Management Plan
ft	feet
FDI	Foreign Direct Investment
GoI	Government of India
ha	Hectare
HFL	Highest Flood Level

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IRC	Indian Road Congress
IS:3025	Indian Standard 3025
KLD	Kilo Liters per Day
Km	Kilometer
lpcd	Liters per capita per day
LOS	Level of Service m
Meter	
m^2	Square meter
mgbl	meters below ground level
m^3/annum	Cubic meter per annum
mg/kg	Milligram per kilogram
MoEF	Ministry of Environment & Forests
ML Area	Mining Lease Area
MPN	Most Probable Number
MSW	Municipal Solid Waste
NAAQ	National Ambient Air Quality
NH	National Highway
NO_2	Nitrogen di-oxide
NOC	No Objection Certificate
NTU	Nephelometric Turbidity Unit
pH	Negative (-) log of Hydrogen Ion Concentration
PM_{10}	Particle size having aerodynamic diameter ≤ 10
$PM_{2.5}$	Particle size having aerodynamic diameter ≤ 2.5
PCU	Public Carrier Unit

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PPE	Personnel Protective Equipment
PUC	Pollution under Control
RBM	River Bed Mining
RL	River Level
SEAC	State Level Expert Appraisal Committee
SH	State Highway SiO_2

Silicon di-Oxide SO_2

Sulpher di oxide T

Tonnes

TOR	Terms of Reference
TSPM	Total Suspended Particulate Matter

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CHAPTAR 1 INTRODUCTION

BACKGROUND

Rivers are the most important life supporting system of nature. For centuries, humans have been enjoying the natural benefits provided by rivers without understanding much on how the river ecosystem functions and maintains its vitality. Man has changed the nature of many of the world's rivers by controlling their floods, construction large impoundments, over exploitation of living and nonliving resources and using rivers for disposal of wastes. Among these, unscientific and indiscriminate extractions of river bed material from riverbed are the rampant activities which are threatening the very existence of the river ecosystem. In order to mitigate the impact of river bed mining on the environment, a scientific assessment is a pre-requisite for framing sustainable development strategies.

Indeed, in a developing country like India, the supply of sand & gravel as a raw material for infrastructure development has a paramount importance. Therefore, the implementation of scientific mining principles through EIA & EMP plays a vital role in sustainable economic growth of our country.

The industries and Commerce Department has issued LOI to 219 sucessful bidders in open auction in 2017-2018. Subsequently, the open auction process was scrapped by Govt. in February, 2019 and replaced with e-auction. However many LoI holders has applied for Environmental Clearance /CTO in 15 cases, EC and CTO were issued by the DEIAA and J&K pollution control Board respectively and in 58 cases, the ToR were issued by the SEIAA and Public hearing was conducted/concluded by the PCB.

The replacing of Open auction with e-auction was challenged in the Hon"ble High court and all the writ petitions filed against the scrapping of open auction process were vigorously contested and were dismissed by the Hon"ble High Court of J&K on 01.05.2020.

Whereas, immediately, thereafter the Industries and Commerce Department has e-auctioned 239 mining blocks across the UT. The e-auction of these blocks has been concluded by 01.06.2020.

Taking a cue from above the above mechanism of fast tracking the Environmental Clearance ; in view of the acute and unprecedented shortage of key material for development works and challenging Covid-19 pandemic, it is hereby ordered that the ToR, Public consultation and Environmental Clearance, till whichever stage already obtained/completed in favour of the previous allottees of the minor mineral blocks shall be deemed to have transferred in favour of the new allottees of e-auction Process, on the same terms and condition of the ToRs, Public consultation and EC. The new allottees shall complete the reaming elements of the EC/CTO process and shall commence mining operation only after the completion of the due procedure.

Copy of the order is enclosed as Annexure.

Benefits of Sustainable River Bed Mining

- Prevents the river bed from becoming shallow due to the deposition of sediments.
- Scientific mining prevents the excessive erosion, which can damage flora, agriculture land and

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Settlements situated in close proximity.

- It maintains the water retention capacity and help to avoid flood like situations.
- It generates useful economic resource for construction and generates employment in local areas.

1.0 PURPOSE OF THE REPORT

Environmental Impact Assessment (EIA) is a decision making tool, in the hands of the Authorities which brings forth the factual position about a project that enables them in arriving at an appropriate conclusion for the proposed projects, to retain them if environmentally sound, and reject if found having deleterious overall impact. EIA identifies the extent of the environmental, social and economic impacts of a project prior to decision making. EIA systematically examines both beneficial and adverse impacts of the proposed project over and above the prevailing conditions of environmental parameters and ensure that these impacts are taken into accountto exceed and remain within the statutory norms. This process has been envisioned and set in motion by the Ministry of Environment, Forests and Climate Change (MoEF &CC) for sustainable development and the final decision is arrived at only when those who matter are made known of the salient features of the project being envisaged close to them and their opinion has been sought in a widely advertised Public Hearing Event under the chairmanship of the district authorities so that public could also express their opinion freely.

This Environmental Impact Assessment report is being prepared and submitted to pollution control board to comply with the Terms of Reference (TOR) received vide letter no. JKEIAA/2019/III/106/113-18 dated 29.11.2019 under EIA notification, 2006 dated 14-9-2006, as amended on 1st Dec 2009 & 4th April 2011, 13th December 2012, 13th March 2013, 9th September 2013 of MoEF & CC, Govt. of India, for seeking environmental clearance for river bed material mining in the applied mining lease area measuring 9.52 hectares falling under Category "B" project.

1.1 ENVIRONMENT CLEARANCE OR EIA PROCESS FOR THIS PROJECT

Mining Lease for river bed material is proposed to be granted as provided in Jammu & Kashmir Minor Mineral Concession Rule - 1962 (State Rules) and amendments. This mine lease will be executed only after the grant of Environment Clearance from SEIAA, which is mandated by the EIA notification of 2006 and subsequent amended notifications issued by MOEF&CC.

As per the Gazette Notification dated 14th Sep, 2006 and its subsequent amendments, the project is classified as Category – B1 Project. The Environmental Clearance process for the proposed project will comprise of three stages. These stages in sequential orderare:-

- Screening
- Scoping
- Public Consultation or PublicHearing
- Appraisal

The flow chart depicting these stages to obtain the prior Environmental Clearance for the project is as given below in Figure1.1.

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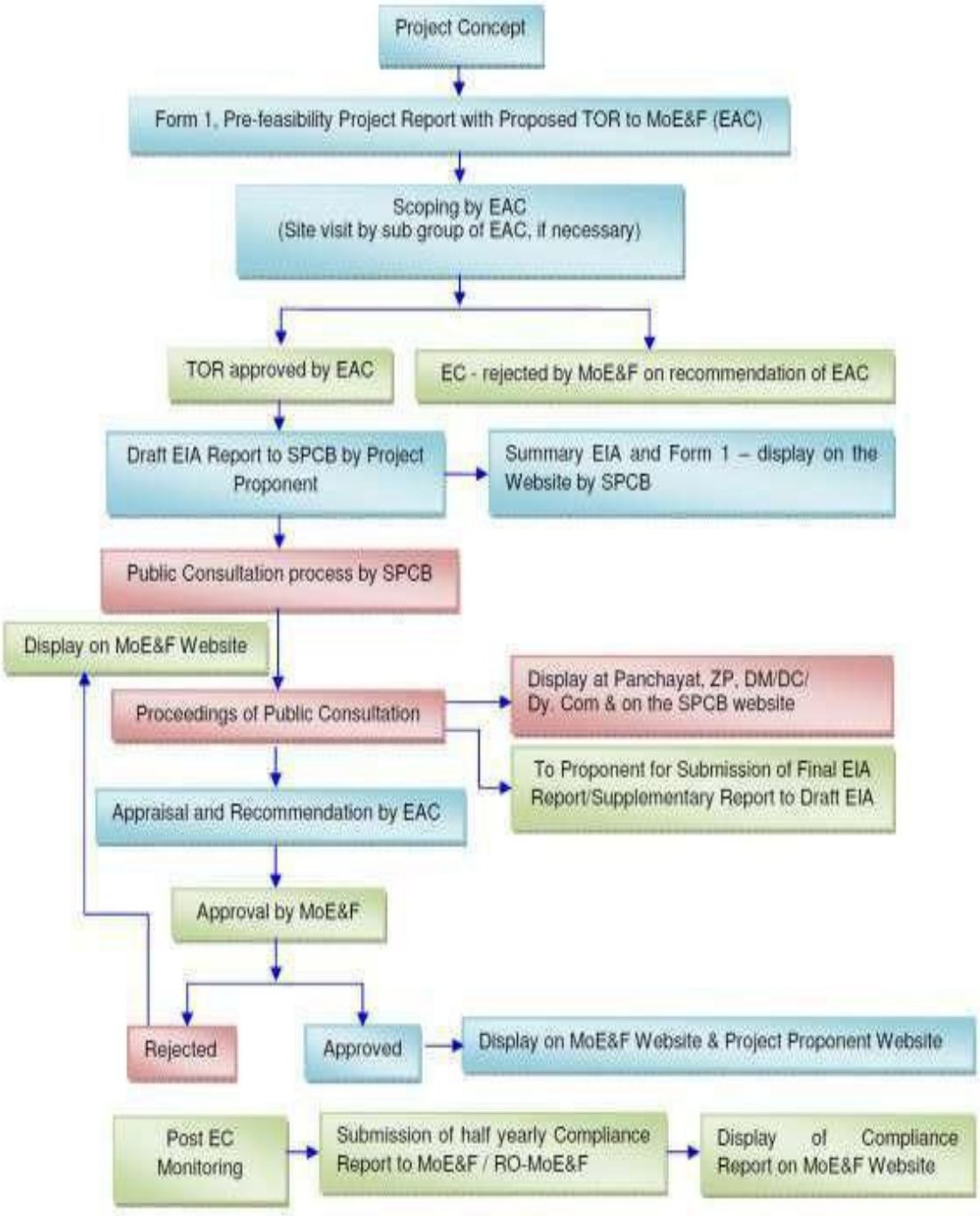

Figure 1.1: Flow Chart Showing the Stages for Obtaining Prior Environmental Clearance

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1.2 IDENTIFICATION OF PROJECT & PROJECT PROPONENT

Name	Shri Sanchit Gautam S/o Sh. Ravi Gautam
Address	R/o Nagrota Near Toll Post Jammu Jammu, State: J & K Mobile No. 7051897192.
BRIEF DESCRIPTION OF PROJECT	
Project Name	River Bed Material Mining
Location of the Project	Block No. 5/9, Khatharwalli Khad Downstream Manoh Khathar Bridge, Village Khathar Tehsil Akhnoor, District Jammu, Jammu & Kashmir
Mine LeaseArea	9.52 ha.

BRIEF DESCRIPTION OF PROJECT

S. No	Information	Details		
1.	Project Name	"MINOR MINERAL (River Bed Material)" Block No. 5/9, Khatharwali Khad Downstream Manoh Khathar Bridge.		
2.	Project Proponent	Shri Sanchit Gautam S/o Sh. Ravi Gautam		
3.	Project Coordinates	**Pillars**	**Latitude**	**Longitude**
		A	$33^0$1'59.03" N	$74^0$46'32.18" E
		B	$33^0$1'59.75" N	$74^0$46'44.81" E
		C	$33^0$2'8.85" N	$74^0$46'32.58" E
		D	3302'9.43" N	74044'32.58" E
4.	Toposheet No.	43L/9		
5.	Altitude of the Area	The Highest Point at 372.45 MSL in WSW direction The Lowest Point at 372.05 MSL in ENE direction		
6.	Location	5/9, Khatharwali Khad Downstream Manoh Khathar Bridge		
	Lease Hold Area	Area: 9.52 Ha		
	Village	Kathar (Jammu Block)		
	Tehsil	Akhnoor		
	District	Jammu		
	State	J & K		
7.	Lease Status	The applicant being the highest bidder was issued with Letter of Intent (LOI) by DGM office vide letter No. 812/MCC/DGM/Block-5/9/Jmu/20/2494-2501Dated:		

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		21-07-2020 under rule 55(9) of Prevention of the Jammu and Kashmir Minor Mineral Concession Storage, Transportation of Minerals and illegal Mining Rules,2016.
8.	Topography of Mine lease area	Non-arable, non-forested land of river bed. (Flood Plain formed by Right Bank of Chenab river, State Land)
9.	Name of the Mineral Mining	River Bed Mineral
10.	Mode of Mining	Open Cast, Semi-mechanized
11.	Total Geological Reserve	5,71,200 MT
12.	Total Mineable Reserve	5,21,100 MT
13.	Capacity of Production	Proposed 86,100 MT/Annum
14.	Life of mine	It is a river bed deposit and mined out area shall be replenished each year during monsoon period and depth of quarry shall be filled back by river bed material each year. Therefore it is not practically forecast the anticipated life of mine.
15.	Drilling / Blasting	No
16.	Man Power Used	13
17.	Land utilization Pattern	100% wasteland earmarked for the River Bed Material mining by the Govt. of J& K.
18.	Project Cost	Rs. 28.88 Lakhs
19.	CER Cost (2% of total Project Cost)	Rs. 0.58 Lakhs
20.	Water requirements and source	Water Requirement: 20.62 KLD of water will be used for the project site (Dust Suppression, Drinking and Plantation) Source: Potable tankers (Drinking purpose) & River water (Dust Suppression & Plantation) will be the source of the water.
21.	Solid waste	None

REGULATORYCOMPLIANCES

Data for environmental parameters will be generated for Ambient Air, water, soil and noise quality.

POST – ENVIRONMENTAL CLEARANCEMONITORING

The project proponent will submit half yearly compliance report in respect of stipulated prior Environmental Clearance terms and conditions on 1st June and 1st Dec. of each calendar year. The latest compliance report will be displayed on the website of the concerned regulatory authority. Environment statement will be prepared based on one year data comprises of six monthly reports. Further environmental conditions will be complied and reports will be submitted at the State

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Pollution Control Board and Regional Office of MoEF&CC.

ToRCOMPLIANCE

TOR Letter No.: JKEIAA/2019/III/106/155-61 Dated: 26-12-2019		
TERMS OF REFERENCE FOR PREPARATION OF ENVIRONMENTAL IMPACT ASSESSMENT REPORT OF RIVERBED MATERIAL MINING		
S. No.	**TOR Points**	**Status of TOR Compliance**
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 seen any increase in production achieved prior to 1994.	The production of the proposed project is as per LOI issued to the project proponent.
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 LOI issued in favour to the project proponent clearly states that proponent is the rightful lessee of the mine.
3.	All documents including approved mine plan, EIA and public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	All the documents will be prepared according to the details mentioned in LOI and requirements of EIA notification 2006 (as amended)
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).	Satellite imaginery of 10 km radius buffer zone showing the general feature around the project site is attached in chapter 2 section 2.2.
5.	Information should be provided on high resolution satellite image on with 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.	Satellite imaginery of 10 km radius buffer zone showing the general feature around the project site is attached in chapter 2 section 2.2.
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.	Such details are mentioned in the report (Form1 & PFR) submitted online.
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	Mention in final EIA report

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	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.	This project is opencast riverbed mining project. The proposed safeguard measures are detailed in chapter 10 of the EIA report
9.	The study area will comprise of l0 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.	Negligible amount of waste is estimated to be generated due to the mining activity since labours will be hired from the nearby villages for daytime as working hours.
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.	Details regarding the present and proposed landuse pattern are detailed in the EIA report
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.	No such action is proposed in the project since all the mined material is saleable to the market directly
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 project area. In the event of any contrary claim by the project Proponent regarding the status of forest, 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 maintained above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	Complied accordingly (if any)
13.	State of forestry clearance for the broken up area and virgin forestland involved in the Project including	Complied accordingly (if any)

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	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'	Complied accordingly (if any)
15.	The vegetation in the RF / PF areas in the study area, with necessary details' should be given.	Complied accordingly (if any)
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.	There will be negligible impact on the wildlife due to mining activity since the mining will be done during day hours only.
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.	All such details are mentioned in the detailed reports submitted for the grant of ToR.
18.	A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET species duly authenticated. Separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	All such details are mentioned in the Final EIA report.
19.	Proximity to Areas declared as 'Critically Polluted' or the project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and famished to the effect that the proposed mining activities could be considered.	Complied accordingly (if any)

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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).	Complied accordingly (if any)
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.	No R&R plan is proposed since the area is government land of riverbed wasteland and free from any sort of habitation.
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 of2009, 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	All the monitoring has been done accoding to guidelines of CPCB
23.	Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation The wind roses showing pre-dominant wind	The data will be submitted in the first six monthly compliance report after the grant of Environment Clearance (EC) from the concerned authority.

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	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.	Details of water requirement are computed in the chapter 2 section 2.8
25.	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Water will be purchased from the vendors of the nearby villages.
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.	Mining will be restricted during monsoon season. No rainwater harvesting is proposed in the project.
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.	Mining will not be done in the area submerged under water channel. Therefore, negligible impact on surface water and the ultimate depth of mining will be restricted upto the depth of 3.0 m
28.	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.	Mining will be done according to the approved mining plan by the Director, Directorate of Geology and Mining, J&K. The ultimate depth of mining will be restricted upto the depth of 3.0 m so no intersection of ground water will take place.
29.	Details of any steam, 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.	The lease area is in the Chenab riverbed and do not propose any diversion of the channel.
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.	All the informations are detailed in the chapter 1 of EIA report
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	The project do not propose any green belt development but proposed plantation will be done in concern with local authorities.

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	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.	Such information will be provided along with the first six monthly compliance report after the grant of Environment Clearance (EC) from the concerned authority.
33.	Details of the onsite shelter and, facilities to be provided to the mine workers should be included in the EIA Report.	Facilities such as rest shelter, drinking water, mobile toilets etc will be provided for the time period of the proposed project.
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.	All such plans are attached in the approved mining plan. The area is riverbed and will replenish every year after the monsoon.
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.	All such measure are detailed under Chapter 7 section 7.3
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.	All such measure are detailed under Chapter 10 section 10.1
37.	Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	All such detailed are mentioned in Chapter 9 section 9.2
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.	All such detailed are mentioned in Chapter 10

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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.	Will be submitted in the final EIA report after conducting the public hearing as per the EIA notification 2006 (as amended)
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.	Complied accordingly (if any)
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.	All the cost are mention in the EIA report
42.	A Disaster management Plan shall be prepared and included in the EIA, /EMP Report.	Details are mentioned in chapter 07 of the EIA 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.	Details are mentioned in chapter 08 of the EIA report
44.	Besides the above, the below mentioned general points are also to be followed:	
a.	Executive Summary of the EIA/EMP Report	Executive Summary as per the notification is attached with the EIA report
b.	All documents to be properly referenced with index and continuous page numbering	Has been complied in all the documents
c.	Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.	Has been complied in all the documents
d.	Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the project.	All such reports will be attached with the final EIA report and original report will be made available during appraisal of the project.
e.	Where the documents provided are in a language other than English, an English translation should be provided.	All the documents are available in English language only
f.	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	Will be complied accordingly and submitted with the final EIA
g.	While preparing the EIA report, the instructions for the proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-1A.II (I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.	Complied accordingly (if any)
h.	Changes, if any made in the basic scope and project parameters (as submitted in Form_ I and the PFR for	Complied accordingly (if any)

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	securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have	
	to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.	
i.	As per the circular no. J-11011/618/2010-IA.II (I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from tie Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.	Will be complied accordingly (if any)
j.	The ELA 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.	All such details are mentioned in the approved mine plan and EIA report.
ADDITIONAL TERMS OF REFERENCE		
1.	Impact of mining activity on adjacent agricultural land with particular reference to run off, soil erosion and top soil loss due to change in topography.	Negligible impact has been estimated and mining will be done as per the approved mine plan by DGM, J&K
2.	Details of Gradient of river bed and 3-D view draped on the satellite image	10km buffer zone radius detailed satellite imaginery is attached within the EIA report
3.	Details of excavation schedule & sequential mining plan	Mining plan is prepared accordingly and has been approved by Director, DGM, J&K
4.	Details of transportation of mined out materials with respect to axle load specified for the road as per the Indian Road congress for both the ways (loaded as well as unloaded trucks) load and its impact on the environment.	Will be provided along with the first six monthly compliance report after the grant of Environment Clearance (EC) from the concerned authority.
5.	Impact of mining activity on the existing land use in the study area.	Will be provided along with the first six monthly compliance report after the grant of Environment Clearance (EC) from the concerned authority.
6.	Impact of mining on aquatic life.	There will be negligilbe impact

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		on the aquatic life since the mining activity will be done on dry riverbed and daytime only.
7.	NOC from competent authority of Forest Department to the effect the mining lease area does not fall under forest land category.	Complied accordingly (if any)
8.	Excavation to be carried out upto a maximum depth of 1 m in the river bed or 1 m above water table whichever comes first.	Mining will be done in accordance with the approved mine plan by the Director, DGM, J&K and will be restricted 1m above the water table (if occur)
9.	Specific measures to be undertaken to mitigate the impact of mining activity on the habitat and migration of fish in the river/steam and concurrence thereof from the Fisheries Department.	Complied accordingly
10.	The Photography and videography shall be part of the Terms of Reference.	Complied accordingly
11.	The maps shall be submitted on a scale of 1: 3000 and 1: 1500 within l0 kms. radius	Has been complied accordingly

EIA report has prepared as per issued ToR. All the points of ToR has been complied with.

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CHAPTER 2 PROJECTDESCRIPTION

2.0 TYPE OF PROJECT

This project is proposed for the excavation of river bed material from the riverbed tributary of River Chenab. It is an opencast semi mechanized mining project to excavate river bed material in its existing form for direct usage as a construction material for infrastructure development.

Mining operators, in conjunction with cognizant resource agencies, must work to ensure that river bed material mining is conducted in a responsible manner. Excessive in-stream river bed material mining causes the degradation of rivers. In-stream mining lowers the stream bottom, which may lead to bank erosion. Depletion of river bed material in the streambed and along coastal areas causes the deepening of rivers and estuaries, and the enlargement of river mouths and coastal inlets. Excessive in stream riverbed mining is a threat to bridges, river banks and nearby structures. River bed mining also affects the adjoining groundwater system and the uses that local people make of the river. Instream riverbed material mining could results in the destruction of aquatic and riparian habitat through some changes in the channel morphology. Impacts include bed degradation, bed coarsening, lowered water tables near the streambed, and channel instability. These physical impacts cause degradation of riparian and aquatic biota and may lead to the undermining of bridges and other structures. Continued extraction may also cause the entire streambed to degrade to the depth of excavation. Scientific approach is required to minimize the impact and make use of river bed material in infrastructure development.

2.1 NEED FOR THE PROJECT

The project helps in the need to foster the infrastructure ecosystem and outlines the policies and reforms which are expected to revive the growth of infrastructure. As a result, demand of river bed material has increased mainly in infrastructure activities like roads, highways, buildings & townships. With the rapid pace of development, the gap between demand & supply of river bed material as construction material must be minimized to control the pricing mechanism. The price correction in the river bed material rates will definitely provide growth impetus to our citizens and as well as to our economy (both directly and indirectly), if it is available legally. Therefore, utilization of river bed material through scientific mining methodologies (sustainable mining) at the stretch of River basin in Jammu & Kashmir must be allowed to support growth in nearby area. Scientific mining of river bed material will help to increase the catchment area of river bed that will reduce the flood impact on river and in periphery on human settlement. River bed material is backbone of construction industry. River bed mining boosts infrastructure development in construction of roads and buildings.

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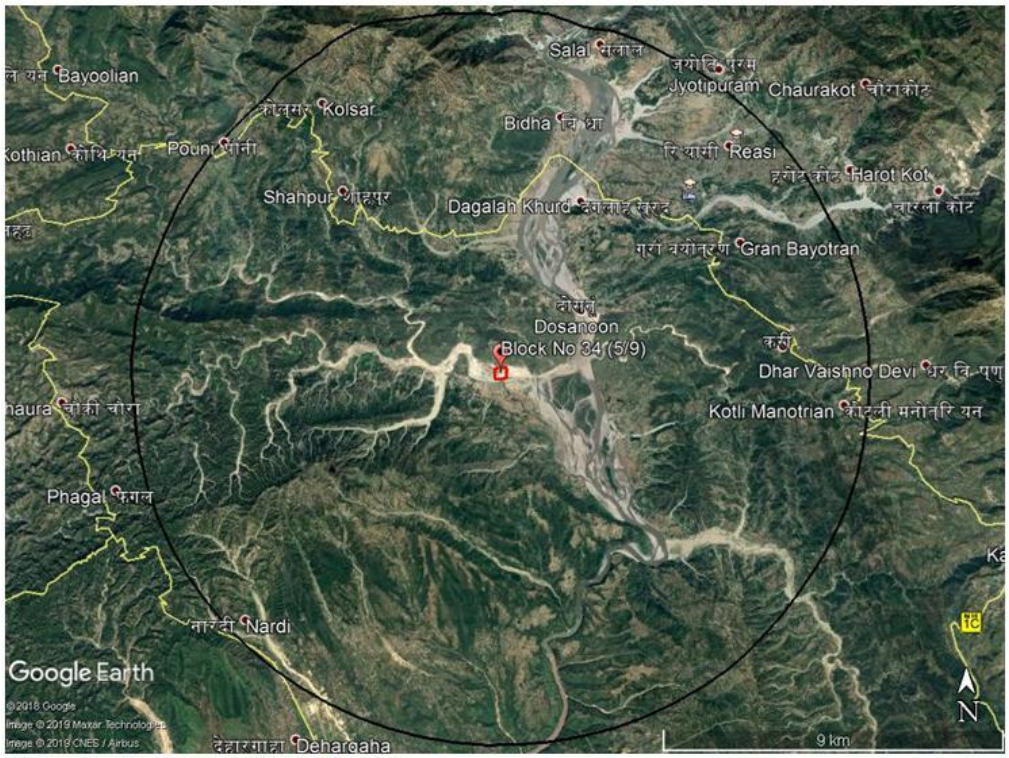
2.2 PROJECT SITE

The proposed project site of Minor Mineral (River Bed Material) mining located Block No.5/9 Khatharwali Khad Downstream Manoh Khathar Bridge, Village- Kathar (Jammu Block), Tehsil: Akhnoor, District: Jammu, J & K, which is about 35 km away from Jammu City. Mining area is 4.5 km away from Katra Reasi Road. The nearest populated town Akhnoor is about 12.3 km in South direction. The Nearest Railway Station is at Shri Vaishno Devi Katra 15.90 Km towards ESE and Nearest Airport, Jammu Airport is 40 km, SSE from the lease area. The location map of project site and surrounding are given below:



Project: *River Bed Material(Minor Mineral)*

Block No. 34(5/9), Khatharwali Khad Downstream Manoh Khathar Bridge
, ***Area:*** *9.52 ha,* ***Village:*** *Kathar(Jammu Block),*
River: *Chenab River,* ***Tehsil*** *–Akhnoor* ***District:*** *Jammu*

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2.3 PROJECT HIGHLIGHT

Salient features of the proposed project are given as follows:

Table 2.1 Salient Features of Project

S. No.	Areas	Name/ Identity	Aerial distance (within 15 km.) Proposed project location boundary
1.	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value.	None	None
2.	Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests.	**Water Sources:** Right Bank of Chenab River	- Core Zone
3.	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration.	None	None
4.	Inland, coastal, marine or underground waters.	None	None
5.	State, National boundaries.	None	None
6.	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas.	Katra- Reasi Road	- 4.5 km, North
7.	Defense installations.	None	None
8.	Densely populated or built-up area.	Pandhal Panasa Jamberi	- 2.3 km, WNW - 1.9 Km, South - 1.30 Km, SW

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9.	Areas occupied by sensitive man-made land uses *(hospitals, schools, places of worship, community facilities).*	**Education** – KV School, Jyotipuram Kandriya Vidylaya **Hospital**– Sub District Hospital, Akhnoor **Worship- Laxmi Narayana Mandir**	- 8.5 Km NE - 12.5. Km, South - 8.5 Km, NE
10.	Areas containing important, high quality or scarce resources. (ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	**No**	No any other mineral except river bed material is available in near 10 km range.The mining area does not fall in any tourist or any pilgrimage site.
11.	Areas already subjected to pollution or environmental damage. (those where existing legal environmental standards are exceeded)	**No**	None
12.	**Areas susceptible to natural hazard which could cause the project to present environmental problems (*earthquakes, subsidence, landslides, erosion, flooding or extreme adverse climatic conditions*)**	The lease area falls under Seismic Zone-V (Very Severe Intensity Zone), which indicates high possibility of earthquake.	

The location map of project site and surrounding are given below.

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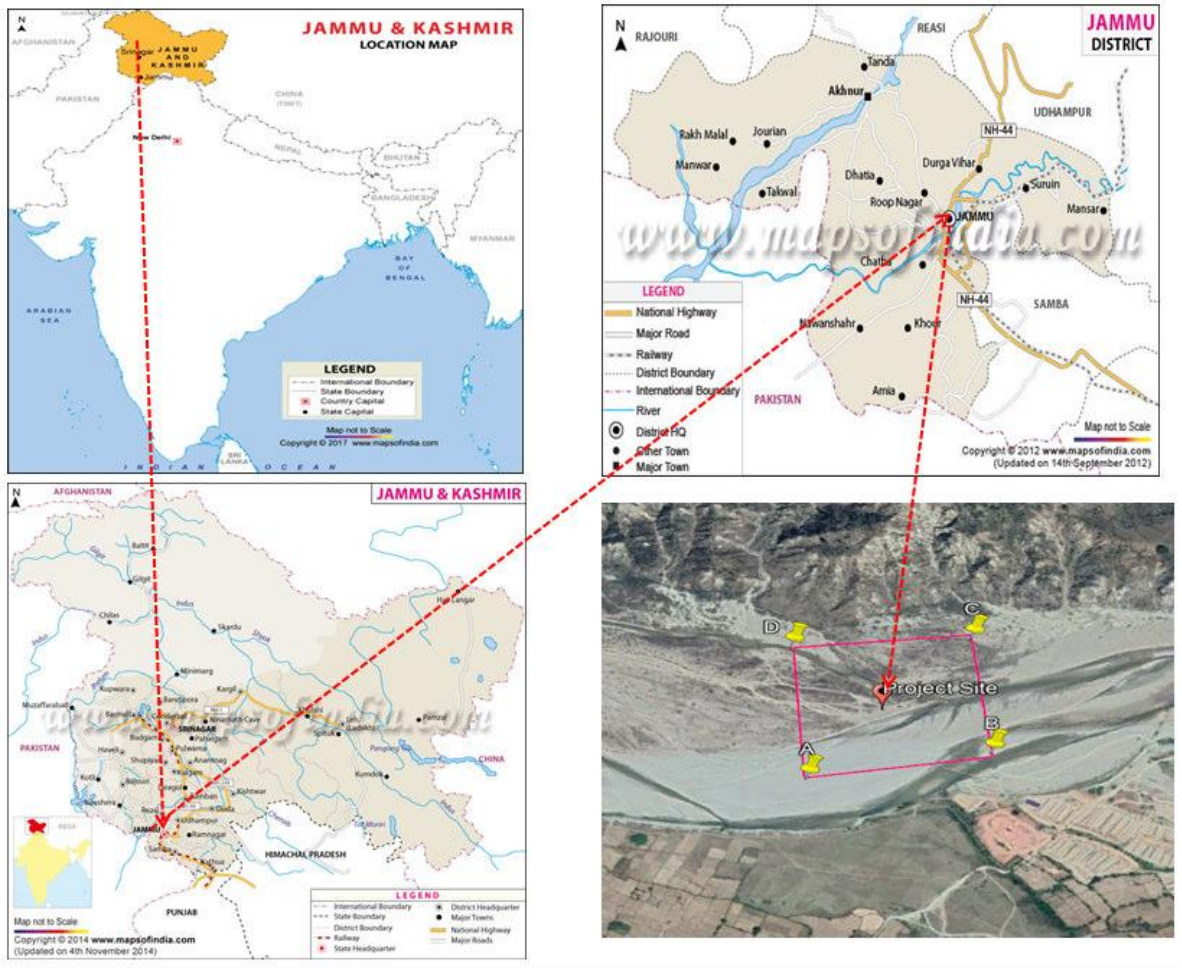
The location map of project site and surrounding are given below.



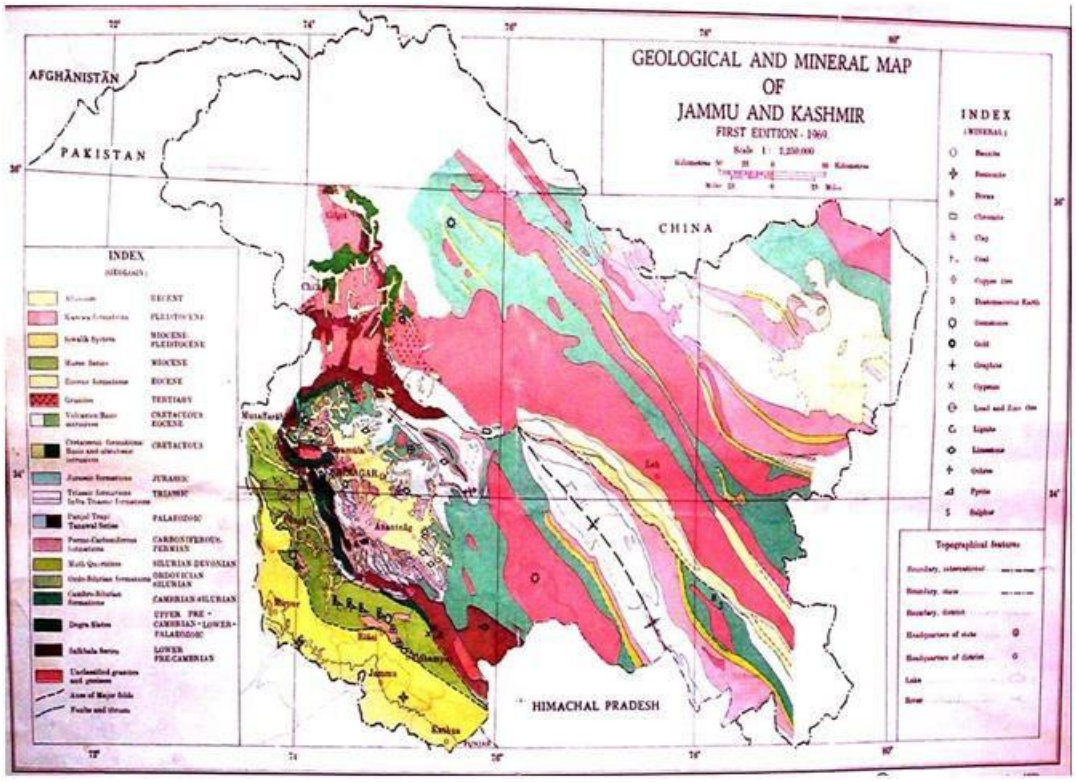
Climate

Jammu region has two different climatic zones depending primarily on altitude. Lower hills & plains bear subtropical climate with hot dry summer lasting from April to July. The summer monsoons coming around middle of July and fading away in early September. This is followed by dry spell from September to November. Winter is mild and temperature seldom touches freezing point. In the high reaches of Chenab valley, the climate is moist temperate, winter are severe and varied quantity of snow is received.

Regional Geology

The Kashmir valley comprises of sedimentary, metamorphic and igneous rocks ranging in age from Salkhala (Precombrian) to Recent. Outer Hill Division covering Jammu, comprises of Siwaliks, Murrees and Dogra Slates types of Geological Formations.

The state comprises of sedimentary, metamorphic and igneous rocks ranging in age from Salkhala (Precombrian) 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.



Map showing Geology and mineral distribution in the state (*source DGM J&K*)

Local Geology

Table 2.2: Litho logy formation and formation of group and super group

Group	Super group	Formation	Litho logy	Age
		Younger and Older Alluvium	Fine to coarse grained sand, silt and clay fine to medium grained micaceous sand, silt and clay. Coarse sand (cobble, boulder)	Recent toUpper Pleistocene
	Upper Siwalik		Conglomerate intercalated with	Pliocene- Middle
	Middle Siwalik Lower Siwalik		sand, silt and clay dominantly coarse-grained sandstone and pink grey mudstone Medium to coarse-grained sandstones and subordinate grey brown mudstone Red Mudstone and fine medium-grainedgrey green sandstone	Pleistocene Upper Miocene Upper Miocene
----------	----------	Main	Boundary Thrust	----------
Murree Group			Sandstone, clay stone, shale and siltstone	Early Miocene
----------	----------	----------	Murree thrust----------	----------

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Banjal/ Siara			Quartzite ,phylites, limestone and carbonaceous phylites	Proterozoic
----------	----------	----------	Panjal thrust----------	----------
Salkhala Group			Sewa Para Gneisses	Proterozoic

Table 2.3 Geological and Mineable Reserves (As per Approved Mine Plan)

S.No	Category	Reserve
1	Total Geological Reserve	5,71,200 MT
2	Mineable Reserve	5,21,100 MT
3	Targeted Productio	86,100 MT/Annum

2.4 PROJECT – ACTIVITIES

This project is proposed for the excavation of river bed material partly from the bed of river. It is an opencast semi mechanized (river bed material) mining project to excavate mineral in its existing form for direct usage as a construction material. So no mineral beneficiation is required. River bed material excavation will be carried out up to a depth of 3.0 m or 1.0 m above the ground water table or whichever is less by using light weight excavators. Year wise proposed production details as per approved Mining Plan are given below:-

Table 2.4 MINING AREA ((SOURCE: MINE PLAN))

Year	Bench Level (mRL)	Production Rate(Tones)	Required Production%
1st	371.75 – 371.25 mRL	86,100	100
2nd	371.75 – 371.25 mRL	86,100	100
3rd	371.75 – 371.25 mRL	86,100	100
4th	371.75 – 371.25 mRL	86,100	100
5th	371.75 – 371.25 mRL	86,100	100

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2.5 MINING METHODOLOGY

As per Jammu & Kashmir Minor Mineral Concession Rules, 1962 extraction of river bed material in bench mode will be limited to 3.0 m depth, width will be approx. 20 m and bench will advance parallel to the bank of the river. Extraction activities will start in the block from the upstream to downstream side. This will not obstruct the movement of water, if any, during monsoon period in the river course. Roads in the lease area for the movement of loaded tippers/ trucks will not have slopes more than 1 in 20. Roads will be properly maintained and water sprinkling will be used for dust suppression. Lease area will have its own approach road, which already exist and is well connected to main highways. Light weight excavators will be used for loading of mineral in tippers/trucks.

The Mining is suggested on rotation basis in such a way that pit of previous year mining will act as depository for the summer season. Proved Category of reserve is considered for mining. Benches of 1.0 to 1.5 m height have been drawn from ultimate pit limit of proved reserves estimated. Area of individual bench is being multiplied by strike influence which gave the volume of the bench. Specific gravity the river bed material is taken as 2.50 which are further multiplied by the volume of the bench.

2.6 CONCEPTUAL MINING PLAN

The digging depth will be restricted to 3.0 m only or 1.0 m above the ground water table. This will be further get replenished during the rainy season. The deposit in the river bed will never exhaust. The material will be regularly replenished during floods by the action of river water. The following steps will be taken care in mining:

Pit limit at the end of lease period

Sites of disposal of waste rock and top soil at the end of lease period

No top soil or waste will be generated in the mining as such no disposal of waste is needed.

The existing and in next five years of mining degradation of land will be as below:-

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Table 2.5 – Present Land use Pattern

Particulars	Present land use (ha)
Pit area	0.02
Infrastructure	0.00
Dumps	0.00
Plantation	0.00
Undisturbed Land	9.50
Total	**9.52**

2.7 PROPOSED INFRASTRUCTURE

Infrastructure including Water Supply and Man Power for the project is discussed as below:

Table 2.6: Proposed Infrastructures

Proposed Basic Amenities will be provided to workers at the mine site during operational phase.	Rest room shelter/Tents, first-aid facility, PP-temporary structure office and Portable Bio-toilets, etc
Power requirement	Only day time Mining operations will be carried out, hence No Electricity is required.
Nearest source of Water supply & Demand	Daily water demand is assumed as 20.62 KLD and it will be procured through tankers by near villages as per demand.
Manpower Requirement	Total employment in the Mining activities will be around 13 People and local villagers will be preferred for skilled and non-skilled jobs after training.

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2.8 WATER DEMAND

20.62 KLD Water will be sourced from nearby villages through water tankers. Permission will be been taken from the Gram Panchayat for the same and will be used for plantation, dust suppression and drinking use.

Purpose	Avg. Demand/ Day
1. Dust suppression() 2. Drinking 3. Land reclamation/plantation	20.5 KLD 0.065 KLD 0.094 KLD
Total	20.62 KLD

Total no of worker	13
Daily Water Requirement (MR-1995, Rule)	@5 LPD/per 13x5 = 65 = 65/1000 =0.065 KLD
Total Domestic Water Requirement	0.065 KLD
Water requirement Dust Suppression Kaccha Road Area	Length 1500 M x Width 6 M
Water Requirement Per Day	=9000 =9000X1.5 = 13500 = 13500/1000 = 13.5 KLD = 13.5 X 3 = 40.5 KLD
Mist Technology Will best used so water requirement less by 50 %	= 40.5 KLD = 20.25 KLD
Thus Water Requirement for Dust Suppression Water	= 20.25 KLD
Water Requirement Plantations (AS per Manual by ministry of Urban Development)	= 5 Lpd/plant
Total No of Plants	5050 5050x5 25250/1000 25.5 KLD
Total No of Working Days	270 Days 25.5/270

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	0.094 KLD
Total Water Requirement for plantations	0.094 KLD

2.9 MAN POWER

Poor section of the society will be given priority in employment at proposed project. 13 (nos.) of people will be benefitted for direct employment and hundreds will get business opportunity in the project.

Table 2.7: Man Power Requirement

S.No.	Category	Numbers
1	Office Assistant/Dispatch Supervisor	1
2	Environment Supervisor	1
3	Office Boy	2
4	Skilled	2
5	Piece rated Worker	7
Total		**13**

2.10 PROJECT COST ESTIMATES:

Mine lease will be executed after getting Environment Clearance from the concerned authority and progressive closure plan will be submitted in due course of time.

The proposed project cost breakup is described as follows:

S. No.	Description	Unit	Total (Rs.)
1.	Laborers charge (Excavation & Loading)	Rs.300 / day (Man power 13) Assuming 270 days)	**10,53,000**
2.	Equipment's/Tools/Machineries	270 days Assuming Rs.5000/day	**13,50,000**
3.	Royalty Charges paid to Govt. (Bid Amount)	-	**1,00,000**
Break-up of Expenditure on Environment Protection & Environment Management			

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4.	Haulage Road Repair & Maintenance	Annual	**2,00,000**
5.	Water Sprinkling on Haulage Road for Dust Suppression	Assuming Rs.500/day for 270 days of working	**1,35,000**
6.	Plantation along the road side	-----	**50,000**
	Total		**Rs. 28,88,000 (28.88 Lakhs)**

CSR (Corporate Social Responsibility) details for the Project

CSR plan is given below:

Total Cost of the Project = Rs. 28.88 Lac

Yearly CSR cost for the project, i.e. 5% of the total project cost

Rs. 28.88 Lace x 0.02 = Rs. 57,760.

CONCLUSION

The mining lease area is 9.52 ha. There is no power requirement in the project as mining will be carried out in day hours only. Water will be sourced through water tankers. The proposed project has positive impact on socioeconomic conditions of the area. 13 People will get employment and few hundred will be indirectly benefitted through business and other allied activities. Mining will be conducted in 270 days in year. The basic objective of the project is to effective utilization of Mineral in the country and /or region. With the development and industrialization has enhanced the demand of building material in last 10-15 years. Mainly in infrastructure projects like highways, buildings, township etc, which has raised the demand of river bed material beside of the other mineral. River bed material mining not only provides the building material but also employment, economic growth of the state that will ultimately enhance the socio-economic status of the people of the region. The project will be environmental compatible to the surrounding due to the high standards of pollution control measures to be adopted during the operation activity. Thus it can be safely stated that the mining activities will not have any adverse effect on the surroundings, if the proper environmental management plan is adopted.

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CHAPTER3DESCRIPTIONOFENVIRONMENT

3.0 INTRODUCTION

EIA process requires the primary baseline data collection to know the information on the biophysical, social and economic backgrounds of Mine Lease Area. The criteria of the baseline data collection was based on the impact zone on both the sides of the river bank which was expected to be around the 2-3 km from both the sides. The monitoring stations were considered based on their sensitivity by considering the close proximity with the sensitive areas like reserve forests, protected forest and national sanctuary. The baseline data have been collected as per CPCB guidelines and approved methodology in the month of March to June 2019 by NABL approved laboratory, OVERSEAS TEST HOUSE & RESEARCH CENTRE PVT. LTD.

3.1 SOURCES OF ENVIRONMENTAL DATA

The baseline information on micro-meteorology, ambient air quality, water quality, noise levels, soil quality and floristic descriptions have largely been drawn from the data generated by NABL accredited laboratory, OVERSEAS TEST HOUSE & RESEARCH CENTRE PVT. LTD. However, Secondary Data is sourced from Census Handbook, Revenue Records, publications of Statistical Department, Reports on soil survey and the records of Land use Organization, District Industries Centre, Forest Department, Central Ground Water Board, etc.

Baseline study

The study area of the Environment Impact Assessment comprises of core and buffer zones. The field survey for the collection of the baseline data commenced in March 2019 and continued till June 2019 representing Pre-monsoon season. The data collected are pertaining to air, water, noise, soil, geology, flora, fauna, land-use, forests and other environmental parameters. A socio-economic study is also conducted in the study area covering large habitations. Field surveys are also conducted in the study area for the purpose of augmenting the remote sensing data. For this purpose data on various attributes such as land features, rivers, forests and vegetation types were recorded from the ground land cover facility (GLCF).

Baseline Data had been collected & analyzed in relation to proposed project is as follows:-

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Physiography Analysis

Topography &Land use Environment

Water Environment

Air Environment

Noise Environment

Biological Environment

Socio-Economic Environment

3.2 COLLECTION AND ANALYSIS OF BASELINE DATA

This section includes the study of natural features like topography, drainage, climate and hydrology etc. Jammu and Kashmir is home to several valleys. Kashmir Valley, Tawi Valley, Chenab Valley, Punch Valley, Sind Valley and Lidder Valley. The Himalayas divide the Kashmir valley from Ladakh while the Pir Panjal range which encloses the valley from the west and the south separates it from the Great Plains of northern India. Along the northeastern flank of the Valley runs the main range of the Himalayas. This densely settled and valley beatifies the whole region.

3.3 TOPOGRAPHY

Jammu and Kashmir is home to several valleys such as the Kashmir Valley, Tawi Valley, Chenab Valley, Poonch Valley, Sind Valley and Lidder Valley. The Kashmir valley is 100 km (62 mi) wide and 15,520.3 km^2 (5,992.4 sq mi) in area. The Himalayas divide the Kashmir valley from the Tibetan plateau while the Pir Panjal range, which encloses the valley from the west and the south, separates it from the Great Plains of northern India. Along the northeastern flank of the Valley runs the main range of the Himalayas. This valley has an average height of 1,850 metres (6,070 ft) above sea-level, but the surrounding Pir Panjal range has an average elevation of 10,000 feet (3,000 m). The Jhelum River is the major Himalayan River which flows through the Kashmir valley. The Tawi, Ravi and Chenab are the other major rivers flowing through the region.

3.4 DRAINAGE PATTERN

The proposed project does not impact natural drainage pattern of the area. There are natural drainages in the area. They are not affected by the proposed project and mining activities.

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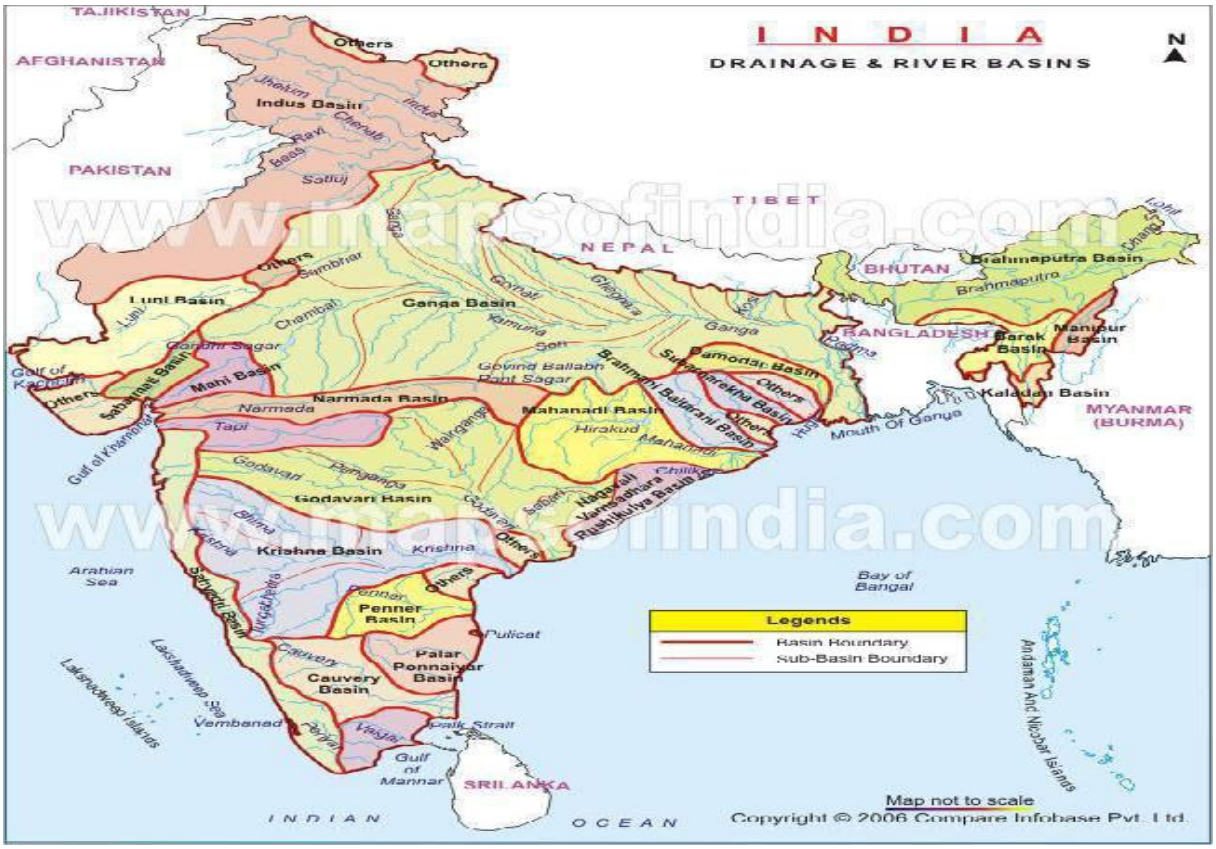

Figure 3.1: Drainage map of India

Floods: Low-lying areas of the Kashmir Valley, especially Sonawari, Awantipora, Srinagar, alongwith parts of Jammu are prone to floods. Upper catchments of all the tributaries of the Jhelum, Indus, Chenab and Tawi rivers are prone to flash floods. An enormous amount of water flows into the valley and the only outlet for the water from the valley is the narrow gorge at Baramulla. Floods generally occur in the summer when heavy rain is followed by a bright sun, which melts the snows. If an embankment is breached or topped, a district which is dry a few hours back becomes a lake after a few hours. On the intervening night of August 5 - 6, 2010, Leh witnessed a devastative cloudburst followed by flashfloods.

3.5 SEISMICITY OF AREA

The project site falls under seismic zone IV which is a high damage risk zone (MSK VIII). The IS code assigns zone factor of 0.24 for zone IV as shown in the seismic zonal map of India.

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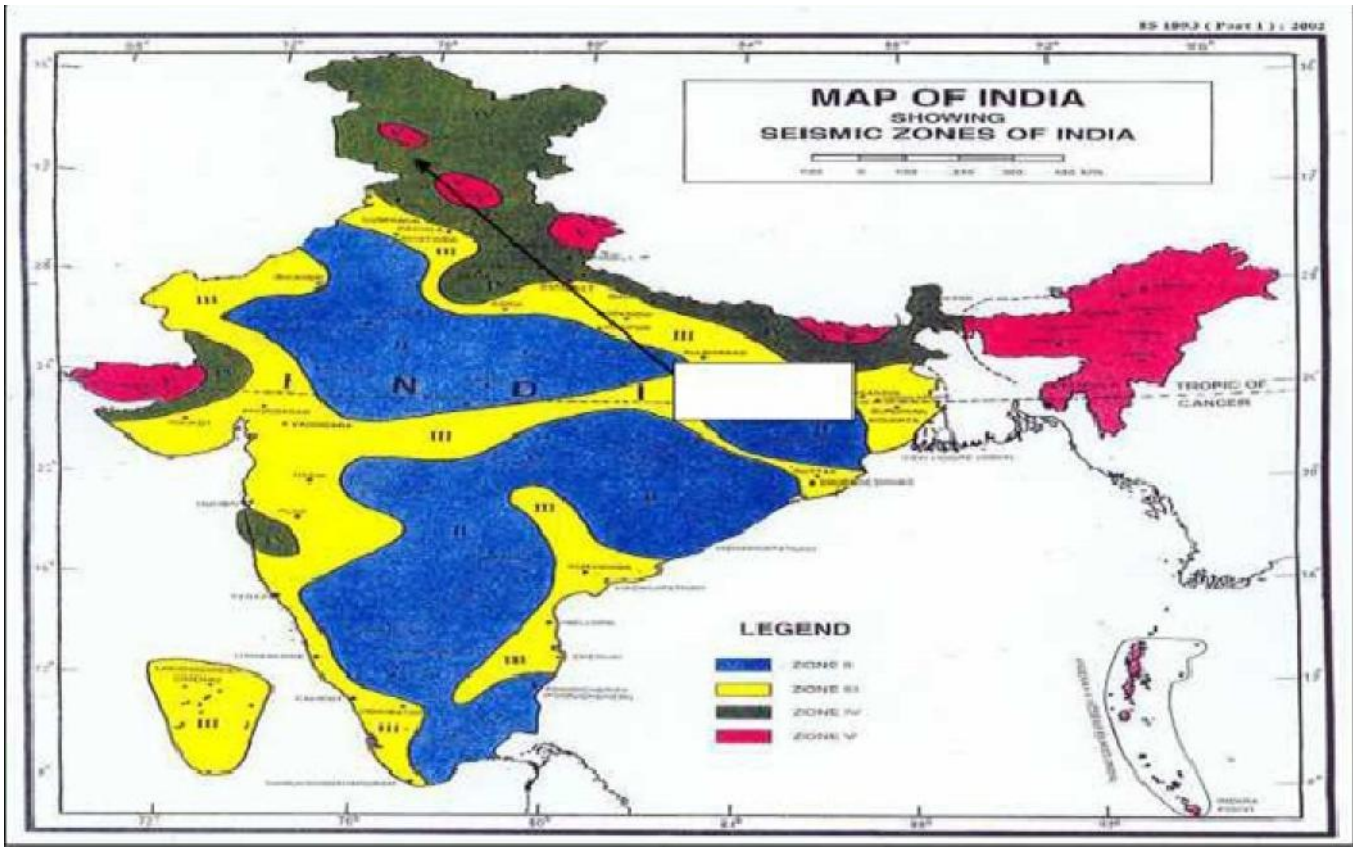

Figure 3.3: Seismic Map of India

Earthquakes: The state of Jammu & Kashmir is the western most extension of the Himalayan mountain range in India. Here it comprises of the Pir Panjal, Zaskar, Karakoram and Ladakh ranges. The Main Boundary Thrust (MBT) underlies the Pir Panjal Range and is known as the Panjal Thrust in the region. The Zaskar ranges which are part of the Great Himalayan range are underlain by the Zaskar Thrust. The Kashmir Valley lies between the Pir Panjal and the Zaskar thrusts, making it very vulnerable to earthquakes. Other northern parts of Jammu & Kashmir are heavily faulted. Along the Zaskar and the Ladakh ranges runs a NW-SE trending strike-slip fault, the longest in the Jammu & Kashmir area. Apart from the routine small tremors moderate to large earthquakes hit nearly all parts of the state. Other major damages are caused by earthquakeas the J & K lies on seismic zone IV in the seismic zone map of India.

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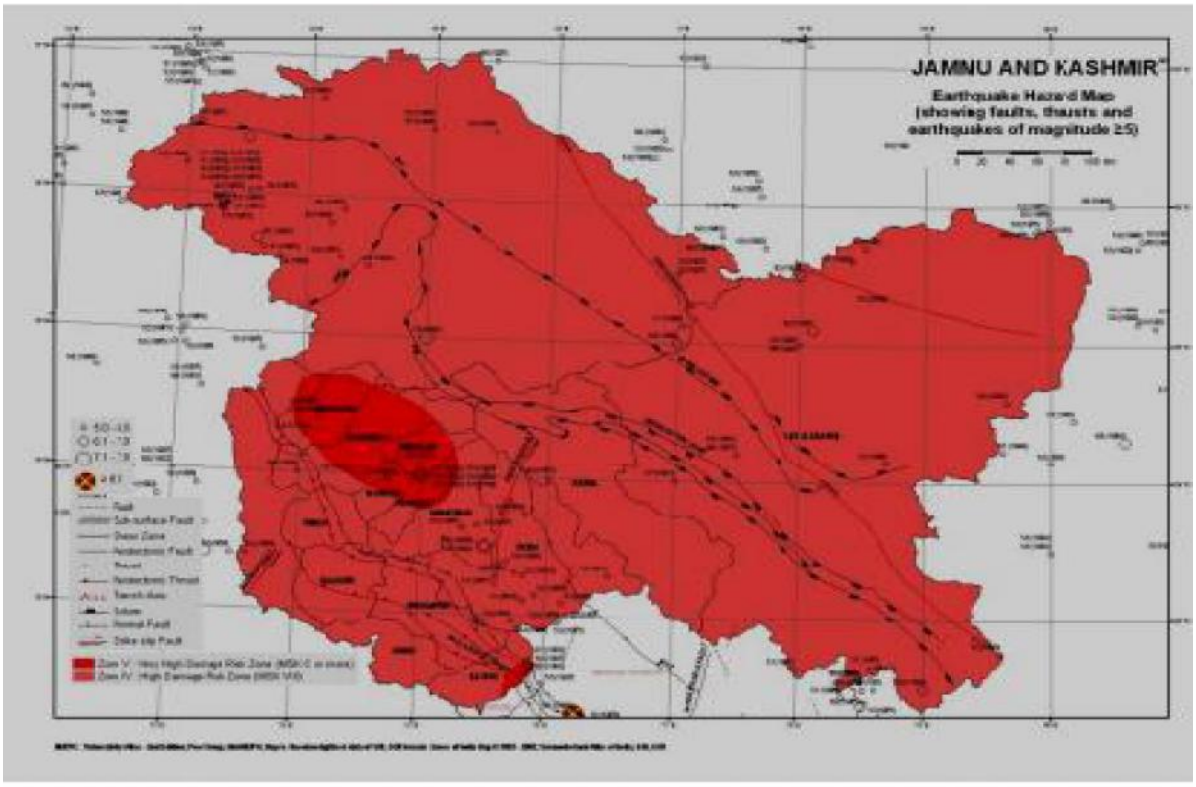

Map showing earthquake hazard distribution (Source: BMTPC)

Figure 3.4: Seismic Map of J & K

3.6 LAND ENVIRONMENT

Object of this study is to provide a baseline status of the study area covering 10 Km radius around the proposed Mine site so that temporal changes due to the mining activities on the surroundings can be assessed. The land-use is divided into agriculture land, settlement, river/ khad and forest area as shown in the map. The area is fertile and dominated by the proportion of agriculture land.

Land Cover Area: Classification scheme adopted for the preparation of land use/land cover maps on 1:50,000 scales.

Following is the Land use pattern of the mine lease area and buffer area in 10 km of radius.

Table 3.2 Land Use Pattern of the Study Area (10 km Buffer Map)

Sr. No	Description of Land	Estimated Area (Ha)	Percentage to total area
1	Khad	869.83	2.50
2	Nala	755.67	2.16
3	River	2014.15	5.78
4	Forest	5739.18	16.47
5	Scrub Land	337.87	0.97
6	Settlement	458.62	1.33
7	Agriculture	24655.2	70.79
Total		**34830.52**	**100**

There is no habitation within lease area.

3.7 SOIL ENVIRONMENT

Soil of the proposed site is influenced by the physiographic features of the area. There is dominance of sub-mountain soil and mountain soil as J & K is home of hills and mountains. Sand is dominated in the soil texture in all the locations. It is observed that sub-mountain soil is dominated in soil map of the area.

Sub-mountain and mountain soils are the types of alluvial soils, which are loamy with little clay content and contain small quantity of lime with high magnesium content. There are three parallel belts widely apart from Forest and Hill soils, one stretching from Poonch to Kathua in Jammu province second North West of Jhelum valley in Kashmir province and the third belt stretching from south eastern part of Ladakh range. The soils are generally mixed with pebbles. In southern part of Udhampur and Doda district brown soil under Deciduous Forest are found. Colour of the soil is dark-brown and varies from dry loams to silt loams with gravels in a small percentage.

In middle Ladakh range two isolated patches (one in Ladakh and another in Doda district) of Podzolised soil occur over a long stretch.

The soil features of the proposed site are characterized by Soil Map of India as given below:

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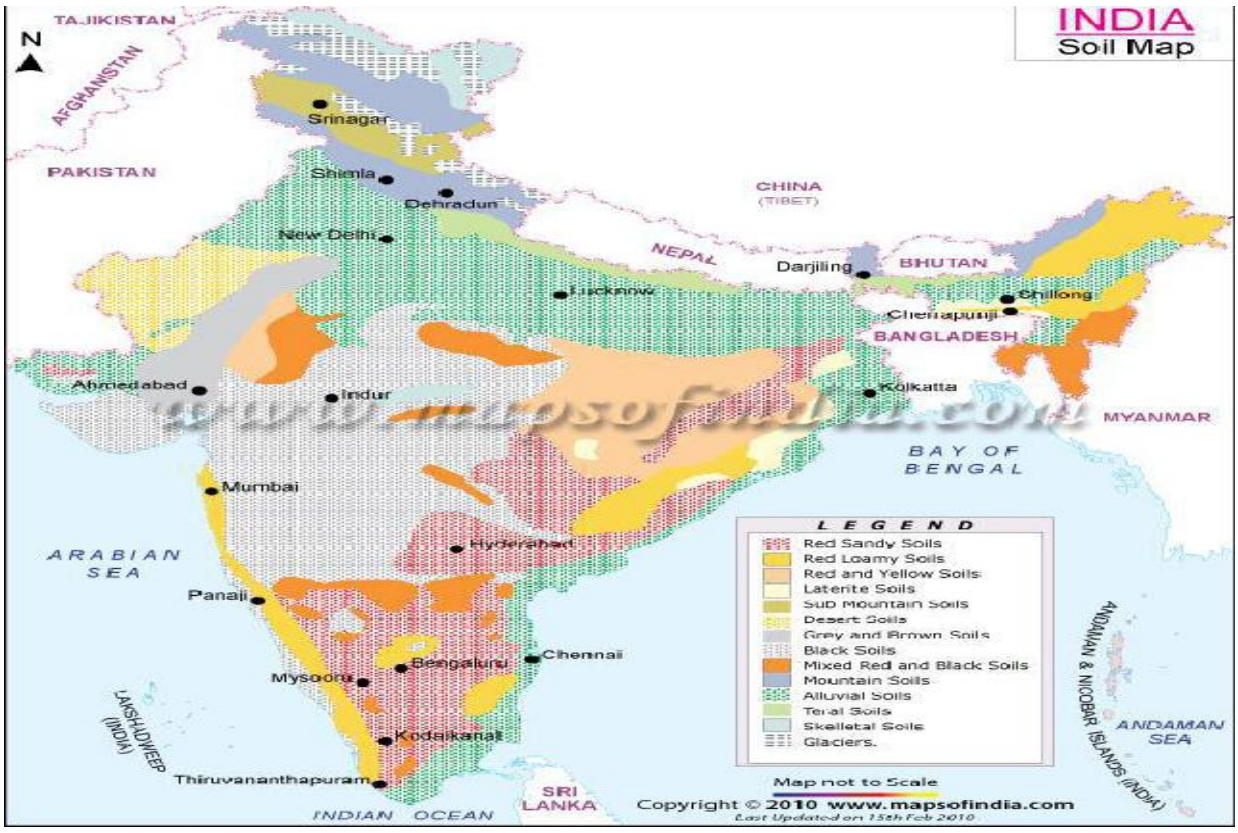

Figure3.6: Soil Characteristics

In the valley this soil is cultivated intensively and rice is the main crop.

Objective of soil monitoring

The objectives of the soil sampling are:-

To determine the baseline soil characteristics of the study area;

To determine the impact of existing as well as proposed activity on soil characteristics and

To determine the impact on soil with view to agriculture.

Soil Monitoring Locations

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Soil monitoring was conducted at locations (6 in nos.) once in season representing core and buffer area of the project. The details of the monitoring locations are given as follows:

Sl. No.	Station Code	Monitoring Station Location
1.	SQ 1	Project Site
2.	SQ 2	Jambri
3.	SQ 3	Pandhal
4.	SQ 4	Panasa
5.	SQ 5	Kans Brahmana
6.	SQ 6	Garan Khalsa

Results and Soil Monitoring

Monitoring was carried in pre-monsoon season at the frequency of once in a season at different locations for physical, chemical and biological properties of the soil at these locations. Sands are dominating in the soil texture at all locations. Analysis results of the soil are given below:

Test Method	Parameter
IS: 2720 (part-4), 1985 Reaff:2006	Texture
IS: 2720 (part-4), 1985 Reaff:2006	Sand
IS: 2720 (part-4), 1985 Reaff:2006	Clay
IS: 2720 (part-4), 1985 Reaff:2006	Silt
Is 2720 (part-26)1987(RA-2011)	pH(1:5 Suspension
Is :14767-2000 (RA-2010)	Electrical Conductivity
LAB-SOP-060	Potassium
LAB-SOP-059	Sodium
LAB-SOP-062	Magnesium
LAB-SOP-085	Sodium Absorption Ratio

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LAB-SOP-049	Water Holding Capacity
LAB-SOP-95	Total Kjeldahl Nitrogen
LAB-SOP-94	Phosphorous
Is:1462 1985(RA-2006)	Bulk Density
IS: 2720 (part-22)	Organic Carbon
IS: 2720 (part-22)	Organic Matter
IS 2720 (part-7)1980(RA-2010)	Porsority
IS: 2720 (part-17)	Permeability

Parameter	**Units**	**SQ Project Site**	**SQ Jambri**	**SQ Pandhal**	**SQ Panas**	**SQ Kans Brahmana**	**SQ Garan Khalsa**
Texture	-	Sandy Clay	Sandy Clay	Sandy Clay	Sandy Clay	Sandy Clay	Sandy Clay
Sand	%	50.80	49.09	45.05	50.54	50.03	50.78
Clay	%	35.29	32.42	35.50	32.98	35.07	30.65
Silt	%	15.91	18.49	19.45	16.48	15.90	18.57
pH(1:5 Suspension)	-	7.45	7.65	7.59	7.88	7.63	7.46
Electrical Conductivity	µmhos /cm	216.3	318.6	314.2	346.2	286.3	316.4
Potassium	mg/kg	253.51	272.69	253.78	265.78	242.11	235.23
Sodium	mg/kg	162.93	112.17	134.77	126.45	115.05	170.61
Calcium	mg/kg	3117.77	4243.73	3219.56	3600.14	2902.64	4429.41
Magnesium	mg/kg	512.88	997.84	579.91	778.15	603.07	707.56
Sodium Absorption Ratio	-	0.60	0.40	0.57	0.50	0.51	0.63
Water Holding Capacity	%	28.27	30.09	35.76	29.66	34.54	31.43
Total Kjeldahl Nitrogen	%	0.055	0.083	0.10	0.063	0.072	0.041
Phosphorous	mg/kg	62.49	57.77	67.23	67.41	66.83	54.59
Bulk Density	gm/cc	1.31	1.30	1.27	1.33	1.28	1.32
Organic Carbon	%	0.49	0.49	0.73	0.36	0.68	0.65

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Organic Matter	%	0.88	0.88	1.31	0.64	1.22	1.16
Porsority	%	40.12	42.11	36.06	40.55	42.22	42.12
Permeability	cm/hr	2.99	3.32	2.24	3.35	2.87	3.87

The analysis results show that soil is basic in nature as pH value varies from location to location property of soil. The concentration of Nitrogen, Phosphorus & Potassium has been found to be low in the soil samples.pH and EC measurements can vary greatly and are affected by several environmental factors including, climate, local biota (plants and animals), bedrock and surficial geology, as well as human impacts on the land.

Low values of EC reflect relatively dilute waters, such as distilled water or glacial melt water.

3.8 WATER ENVIRONMENT

Source of water for the proposed project is River and the irrigation canals. The ground water properties vary with locations. Ground water movement is restricted to inter-mountain valleys.

Objective of Water Monitoring

Water samples are collected from Ground water (6 in nos.) and Surface water (2 in nos.) to study the water quality in the core and buffer areas in pre-monsoon season. The purpose of the study is to assess the water quality characteristics and study of impact due to proposed project. The objective of analysis of water quality is given as follows:

Objective discussed as follows:

To evaluate the impacts on people, agriculture productivity, habitat conditions, recreational resources and aesthetics of the vicinity and environment.

To evaluate the physical, chemical and biological properties of drinking water quality in the study area.

To analyze physical, chemical and biological properties and to assess impact of project on water quality (if any).

To evaluate the impacts on agriculture productivity, habitat conditions, recreational resources and aesthetics of the vicinity;

To predict the likely impacts on water quality due to the mining and related activities.

This river bed material mining project is on river bed. The project itself is a part of surface water body. The applied lease falls in River Bed. Objective of water analysis is discussed as follows:

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Water Monitoring Locations
Analysis and Results of Water samples

Samples were collected from the proposed site and buffer area representing site, human settlement, sensitive area and commercial area and analyzed for physical, chemical and biological parameters.

Surface Water samples were taken from 2 locations for the representing the upstream and Downstream area and analyzed for physical, chemical and biological properties. There are other nalas and small streams which are tributaries of River in the study area.

Sl No	Parameter	Test Method	Downstream	Upstream	Units
1	pH	APHA: 4500-H+ B 23nd Edition	7.55	7.55	-
2	Temperature	IS:3025(Part-09)	24.1	24.1	^{O}C
3	Turbidity	APHA: 2130-B Nephelometric Method 23nd Edition	<1.0	<1.0	NTU
4	Conductivity@25°C	APHA: 4500-H+ B 23nd Edition	461.1	462.4	µs/cm.
5	Total Suspended Solid	IS:3025(Part-17)	<5	<5	mg/l
6	Total Alkalinity ($AsCaCO_3$)	IS:3025(Part-23)	86	86	mg/l
7	Biological Oxygen Demand (Max.)	IS:3025(Part-44)	1.5	1.4	mg/l
8	(asO_3) Min.	IS:3025(Part-38)	8.1	8.3	mg/l
9	Calcium(as Ca)	IS:3025(Part-40)	42.20	40.60	mg/l
10	Magnesium (as Mg)	IS:3025(Part-46)	5.83	5.83	mg/l
11	Chloride(as Cl) , Max	IS:3025(Part-32)	15.65	15.65	mg/l
12	Iron(as Fe),Max	IS:3025(Part-53)	<0.05	<0.05	mg/l
13	Fluoride(as F),Max	APHA-4500F	0.18	0.18	mg/l
14	Total Dissolved Solid	APHA: 5220 B 23nd Edition	290	274	mg/l
15	Total Hardness(as CaCO3)	IS:3025(Part-21)	133	129	mg/l
16	Sulphate (as SO4)Max	IS:3025(Part-24)	3.96	2.50	mg/l
17	Phosphate(as P)	IS:3025(Part-31)	<0.2	<0.2	mg/l
18	Sodium(as Na)	IS:3025(Part-45)	14.6	14.3	mg/l
19	Manganese(as Mn)	IS:3025(Part-59)	<0.1	<0.1	mg/l
20	Total Chromium (as Cr)	IS:3025(Part-52)	<0.01	<0.01	mg/l
21	Zinc(as Zn)	IS:3025(Part-49)	<1.0	<1.0	mg/l
22	Potassium(as K)	IS:3025(Part-45)	2.5	2.3	mg/l
23	Nitrate(as NO3),Max	IS:3025(Part-34)	<0.1	<0.1	mg/l
24	Cadmium(as Cd)	IS-3025(Part-41)	<0.01	<0.01	mg/l
25	Lead(as Pb)	IS:3025(Part-47)	<0.01	<0.01	mg/l
26	Copper(as Cu)	IS:3025(Part-42)	<0.1	<0.1	mg/l
27	Chemical Oxygen Demand	APHA: 5220 B 23nd Edition	10.82	6.03	mg/l

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28	Silica	IS:3025(Part-35)	7.67	7.03	mg/l
29	Arsenic(as As)	IS:3025(Part-37)	<0.01	<0.01	mg/l
30	Total Coli Form	IS:1622	Absent	Absent	MPN/1

Ground Water samples were taken from 6 locations for the representing the core and buffer area and analyzed for physical, chemical and biological properties. There are other nalas and small streams which are tributaries of River in the study area.

Sl no.	Parameter	Test method	Acceptable Limit	Permissible limit
1.	pH	APHA: 4500-H+ B 23nd Edition	6.5-8.5	-
2.	Colour	APHA: 2120-b Visual Comparison Method 23nd Edition	5	25
3.	Odour	IS-3025(Part-05)	Agreeable	Agreeable
4.	Taste	IS:3025(Part-7)	Agreeable	Agreeable
5.	Turbidity	APHA: 2130-B Nephelometric Method 23nd Edition	1	10
6.	Total Hardness (as CaCO 3)	APHA: 2340 C 23nd Edition	200	600
7.	Calcium(as Ca)	APHA: 3500-Ca B 23nd Edition)	75	200
8.	Magnesium(as Mg)	APHA: 3500-Mg B 23nd Edition	30	100
9.	Chloride(as Cl)	APHA: 4500-Cl-B 23nd Edition	250	1000
10.	Iron(as Fe)	APHA: 3500-Fe B 23nd Edition	0.3	No Relaxation
11.	Fluoride(as F)	APHA: 4500-F-D 23nd Edition	1	1.5
12.	Total Dissolved Solid	APHA: 2540 C 23nd Edition	500	2000
13.	Phenolic Compound (as C 6 H 5 OH)	IS: 3025 (Part-43)	0.001max	0.002 Max
14.	Sulphate (as SO 4)	APHA: 4500-SO4 E 23nd Edition	200	400
15.	Nitrate (as NO 3)	IS: 3025 (Part-34)	45	No Relaxation

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16	Cadmium (as Cd)	APHA: 3111 B 23nd Edition	0.003	No Relaxation
17	Lead (as Pb)	APHA: 3111 B 23nd Edition	0.01	No Relaxation
18	Copper (as Cu)	APHA: 3111 B 23nd Edition	0.05	1.5
19	Zinc	APHA: 3111 B 23nd Edition	5	15
20	Manganese (as Mn)	APHA: 3111 B 23nd Edition	0.1	0.3
21	Nickel (as Ni)	APHA: 3111 B 23nd Edition	0.02	No Relaxation
22	Alkalinity	APHA: 2320 B Alkalinity 23nd Edition	200	600
23	Sulphide (as H 2 S)	IS:3025(Part-29)	0.05	No Relaxation
24	E.Coli	IS:1622	Absent	Absent
25	Coli form	IS:1622	Absent	Absent

S. No	**Parameter**	**GW Project Site**	**GW Jambri**	**GW Pandha l**	**GW Panas**	**GW Kans Brahm ana**	**GW Garan Khalsa**	**Unit**
1	pH	7.42	6.92	7.53	7.80	7.90	7.41	-
2	Colour	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	Haze n
3	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	-
4	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	-
5	Turbidity	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NTU
6	Total Hardness (as CaCO 3)	216.00	264.00	204.00	228.00	198.00	264.00	mg/l
7	Calcium(as Ca)	77.40	96.00	75.20	80.40	60.60	93.20	mg/l
8	Magnesium(a s Mg)	4.80	5.83	3.89	2.92	8.69	4.75	mg/l

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9	Chloride(as Cl)	15.22	16.22	6.08	8.11	7.17	20.31	mg/l
10	Iron(as Fe)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/l
11	Fluoride(as F)		0.10	0.17	0.21	0.01	0.21	mg/l
12	Total Dissolved Solid	412	458	329	405	349	460	mg/l
13	Phenolic	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/l
14	Sulphate (as	1.89	1.50	1.16	3.00	1.19	1.75	mg/l
15	Nitrate (as	0.21	2.08	0.11	0.17	1.65	0.22	mg/l
16	Cadmium (as	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/l
17	Lead (as Pb)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l
18	Copper (as	<0.1	<0.1	<0.1	<0.1	<0.1	<0.01	mg/l
19	Zinc	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	mg/l
20	Manganese	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/l
21	Nickel (as	<0.1	<0.01	<0.1	<0.01	<0.1	<0.01	mg/l
22	Alkalinity	178	208	132	132	188	264	mg/l
23	Sulphide (as	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l
24	E.Coli	Absent	Absent	Absent	Absent	Absent	Absent	E.Co
25	Coli form	Absent	Absent	Absent	Absent	Absent	Absent	MPN

Discussion of Result

The results of water samples are collected at 6 locations in the pre-monsoon season as discussed above for physical parameters, general parameters, toxic and biological parameters.

Parameters like chlorides and sulphate were observed to be well within the prescribed limits. The physico – chemical analysis for some of the parameters is exceeding the standards as per IS: 10500. The necessary treatment required to minimize the impact has been mentioned in EMP and cost to be borne by the Project Proponent.

3.9 AIR ENVIRONMENT

The prime objective of the baseline air monitoring was to evaluate baseline of Ambient Air Quality in the core & buffer area of the proposed project. The Ambient Air Monitoring locations are selected considering the project layout and meteorology of the area. This is useful for

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assessing the conformity to standards of the ambient air quality during the operation of the mine. The baseline status is assessed though a scientifically designed ambient air quality monitoring network based on the following considerations:-

Meteorological conditions;

Topography of the study area;

Background of Ambient Air Quality

Micro-Meteorological Data

Meteorology is the key to understand the air quality. The essential relationship between meteorological condition and atmospheric dispersion involves the wind speed and direction in the broadsense. Other factors such as variation in temperature, humidity, cloud amount, atmospheric stability classes etc. also plays a direct role in dispersion and dilution of pollutants. Wind fluctuations over a wide range of time, accomplish dispersion and strongly influence other processes associated with them.

The monthly mean meteorological data recorded are given as follows:-

Table 3.9: Micro-meteorology of the area

Months-	**Wind Speed (m/sec)**	**Temperature ^{0}C)**		**Relative Humidity (%)**	
		Highest	Lowest	Highest	Lowest
April	1.6	25	10	70.2	62.3
May	1.7	33	16	66.9	55.9
June	1.5	40	21	58.2	52.7

Wind Rose Diagram

Wind rose is the diagrammatic representation of wind speed and frequency in a specified direction with its arms representing sixteen directions. Each arm gives a clear frequency distribution of wind speed in a particular direction for a given period of time.

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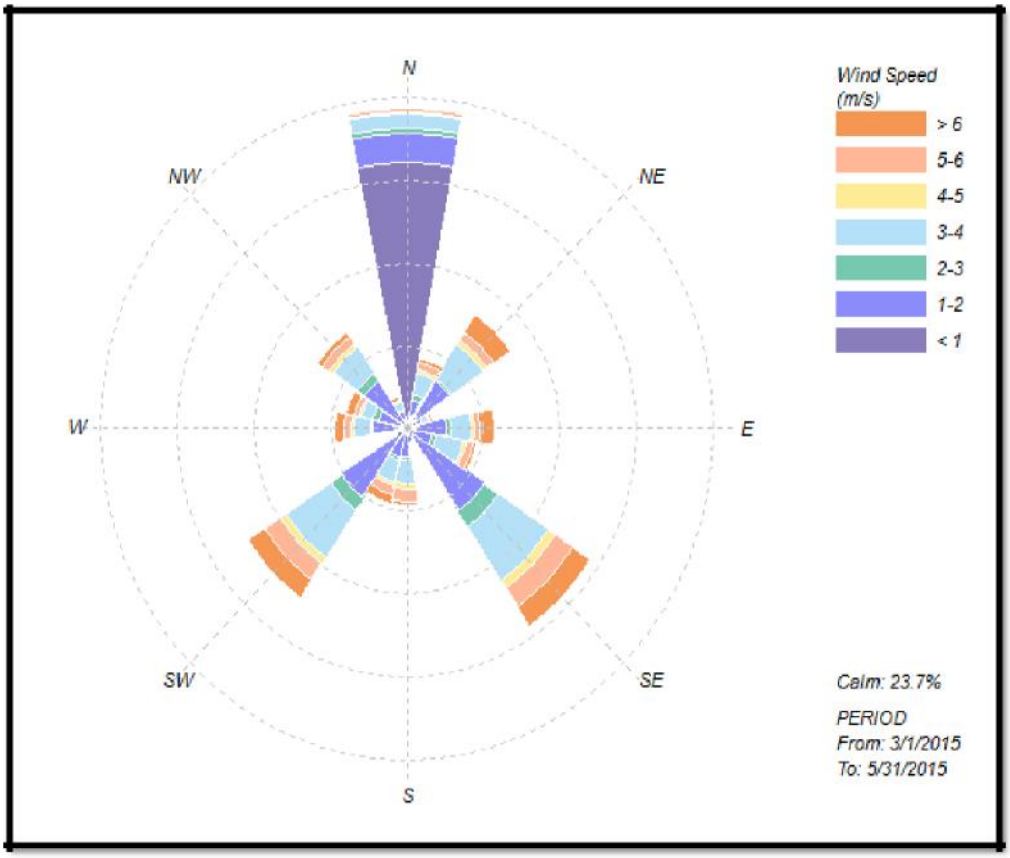

Figure 3.9: Windrose Diagram

The prominent wind direction during this period was from N and from SE. This is followed by southwest direction of wind. The average wind speed recorded during the study period was 8km/h. Calm conditions prevailed for 23.7 % South and North-West are the worst affected quadrant due to proposed project.

Micro-meteorology

Site specific micro-meteorological data is collected at the site for March to June in Pre-Monsoon season. Results are given below.

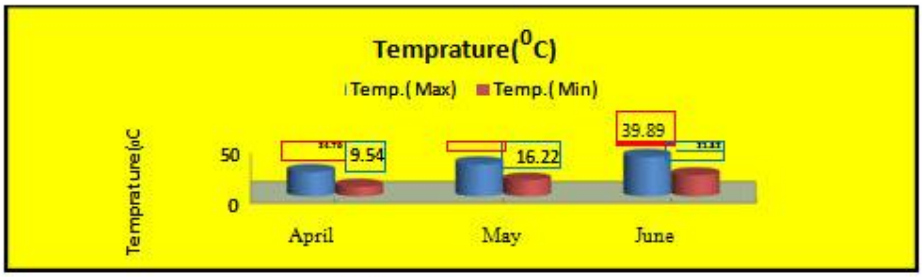

Fig. - Monthly avg. temperature in Pre-monsoon

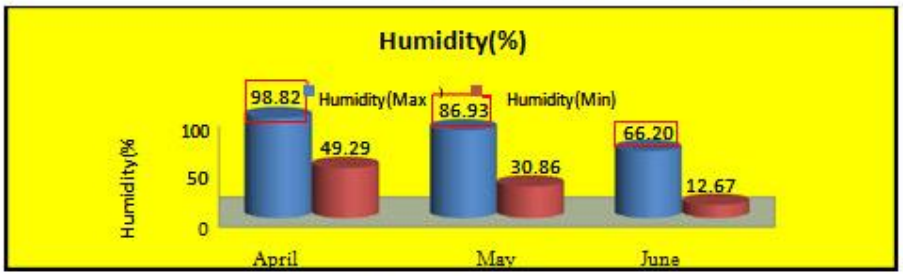

Fig. - Monthly avg. humidity in Pre-monsoon

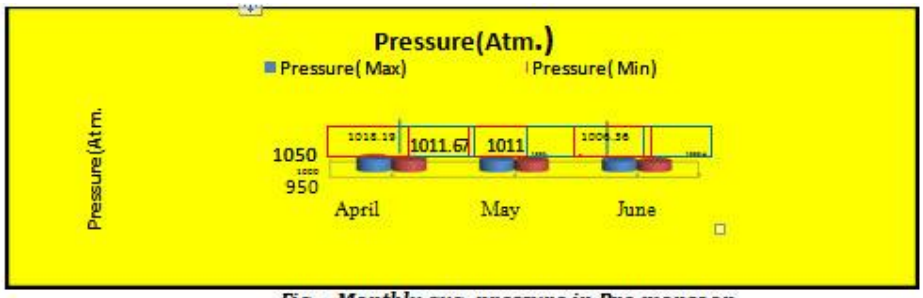

Fig. - Monthly avg. pressure in Pre-monsoon

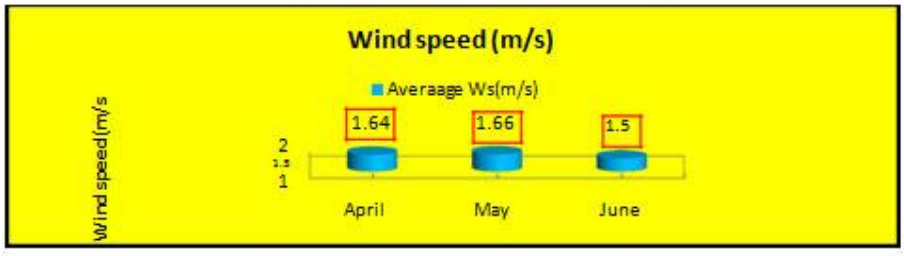

Figure 3.10:Micro-meteorology in Pre-monsoon

Locations of Ambient Air Quality Monitoring Stations.

The details of the Ambient Air Quality monitorng statios are shown below.

Table 3.10: Ambient Air Quality Sampling Locations

Sl. No.	Station Code	Location	Project Area
1.	AQ 1	Project site	Core Zone
2.	AQ 2	Jambri	Buffer Zone
3.	AQ 3	Pandhal	Buffer Zone
4.	AQ 4	Panasa	Buffer Zone
5.	AQ 5	Kans Brahmana	Buffer Zone
6.	AQ 6	Garan Khalsa	Buffer Zone

Environmental parameters and Frequency

Parameters	Sampling Frequency
PM_{10}	24 hourly sample twice a week
$PM_{2.5}$	24 hourly sample twice a week
SO_2	8 hourly for 24 hrs sample twice a week
NO_x	8 hourly for 24 hrs sample twice a week
Carbon Monoxide	Hourly for 24 hrs sample twice a week

Ambient Air Quality Monitoring results

Ambient Air monitoring was conducted at different locations for $PM_{2.5}$, PM_{10}, SO_2 and NO_2 during pre-monsoon season as per method specified by CPCB. The results of analysis for the environmental parameters are shown below. The results of Silica freely available are analyzed at 8 AAQM stations.

Discussion of Results

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The Ambient Air Quality Monitoring reveals that of monitoring stations with minimum concentrations of PM_{10} were 40.40 µg/m^3 at AQ4 and maximum 58.10 µg/m^3 at AQ6. The result of $PM_{2.5}$ reveals that the minimum concentration of 30.41 µg/m^3 at AQ3 while maximum concentration of 30.71 µg/m^3 was found at AQ6.

The gaseous pollutants SO_2 and NO_x were within the prescribed CPCB limit of 80 µg/m^3 for residential and rural areas at all stations. The minimum & maximum concentrations of SO_2 were found to be 1.2 µg/m^3 at AQ4 & 2.41 µg/m^3 at AQ6 respectively. The minimum & maximum concentrations of NO_x were found to be 3.23 µg/m^3 at AQ6 & 4.63 µg/m^3 at AQ6 respectively. The free silica content in PM10 was found to be minimum 1.10 g/m^3 and maximum 4.25 g/m^3 at AQ6 and AQ6 respectively.

3.10 NOISE ENVIRONMENT

The main objective of noise monitoring in the study area is to establish the baseline noise level and assess the impact of the noiselevel on the ambient noise in core and buffer areas

The impact of noise on the surrounding community depends on:

Characteristics of noise sources are instantaneous, intermittent or continuous in nature. It is well known that steady noise is not as annoying as one feels compared to continuously varying noise.

High noise levels at night in residential areas are not acceptable.

Noise level is monitored in day & night and results are compared with respect to CPCB standards applicable to that area.

CPCB categories the area into

Industrial

Commercial

Residential and

Silence zone and separate noise level standard in day and night for each area.

The environmental impact of noise can have several effects varying from Noise Induced Hearing Loss (NIHL) to annoyance on loudness of Noise levels.

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Monitoring locations

Ambient Noise Monitoring was conducted at 6 locations in core and buffer areas. The locations were representative of proposed site, human settlements, commercial, industrial and sensitive areas monitored at one hour interval for 24-hours in pre-monsoon season.

Sl. No.	Station Code	Location	Project Area
1.	NQ 1	Project site	Core Zone
2.	NQ 2	Jambri	Buffer Zone
3.	NQ 3	Pandhal	Buffer Zone
4.	NQ 4	Panasa	Buffer Zone
5.	NQ 5	Kans Brahmana	Buffer Zone
6.	NQ 6	Garan Khalsa	Buffer Zone

Methodology:-

Nose monitoring was conducted at 1-hour interval for twenty four hours in Day (06:00 – 10:00) and Night (10:00 – 06:00) separately for all sampling locations as per method recommended by CPCB/MoEF. The results were compared with standards applicable for the areas as given below.

Table 3.14: CPCB standards for Ambient Noise Quality

Area Code	Area	Limit in dB(A)	
		Day	Night
A	**Industrial**	75	70
B	**Commercial**	65	55
C	**Residential**	55	45
D	**Silence**	50	40

Note:-

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1. Day time shall mean from 6.00 a.m. to 10.00 PM
2. Night time shall mean from 10.00 p.m. to 6.00 PM
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

Table 3.15: Ambient Noise Monitoring Results

The statistical analysis is done for measured noise level at 6 locations. The parameters are analyzed for Leq (day) and Leq (night). The statistical analysis results are given in below:-

S. No.	Project Site	Station code	Leq Value monitored, in dB(A)	
			DAY*	NIGHT*
1	NQ-1	Project site	50.55	30.10
2	NQ -2	Jambri	52.47	35.80
3	NQ -3	Pandhal	49.30	39.10
4	NQ -4	Panasa	51.20	37.20
5	NQ -5	Kans Brahmana	49.50	39.80
6	NQ -6	Garan Khalsa	49.20	38.20

Discussion of Result

The values of noise observed in some of the areas are primarily owing to vehicular traffic and other anthropogenic activities. Noise monitoring reveals the maximum & minimum noise levels at day time and noise levels at night time were found.

3.11 BIOLOGICAL ENVIRONMENT

Introduction

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

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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.

The biological study was under taken by Ecology & Biodiversity Expert, as a part of the EIA study report to understand the present status of ecosystem prevailing in the study area, to compare it with past condition with the help of available data, to predict changes in the biological environment as a result of present activities and to suggested measures for maintaining its health.

The state of J & K has been regarded as heaven on earth, and is also called the biomass of state of India. The biodiversity of the rich area of J&K happens to be one of the 26 hotspots in India with high endemicity. The whole Himalayan belt is one hotspot mega ventre having 8 critical areas which includes two regions from the state viz Ladakh and Kashmir. The environments, social and economic value of plants are very well known. On the other hand, the faunal component of biodiversity of the state is rich with interesting and unique forms both in the forest zone and above forest line. The variety of animal forms ranges from higher groups like vertebrates, including mammals, birds, reptiles, amphibians and lower groups like invertebrates including insects and even unicellular micro organisms.

The information to study the flora around 10 km radius was gathered from the local habitants. All the collected data interpret the impact of pollution on the flora and fauna of that region. Local survey of the mild plants as well as cultivated crop plants was made and all the available information was recorded.

Objectives and Purpose of Study:

The basic objectives of the study are to evaluate the status of the flora and fauna of the core area and the buffer areas with specific reference to the rare or endangered or endemic or threatened (REET) species. The study is also designed to evaluate the adverse impacts of the proposed activity, if any and to suggest remedial / mitigation measures in accordance with the objectives as desired by the IAIA and the Ministry of Environment , Forests & Climate Change (MoEF&CC), Government of India (GoI).

Forest Cover in the District

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The District has two Forest Divisions Viz. Kathua & Billawar and one Wildlife division viz. Jammu East Kathu Wildlife division. There are five forest types occurring in the State Viz. Subtropical Dry Evergreen, Himalayan Moist Temperate, Himalayan Dry Temperate, Subtropical Pine and Sub-alpine and alpine Forests.

Forest Division

This division has an area of 467.27 Sq. Kms. The Main tree species are Bamboo, Chir, Khair and other broad leaved species. According to survey, the Forests are rich with 178 plant species, 10 species of wild animals, 71 bird species and a large No. of speices of snakes and lizards. Division is divided into 3 territorial ranges Viz. Kathua, Jammu and Jasrota. There is one Soil Conservation Range.

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.

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:

Proposed Methodology for Terrestrial Ecology 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.

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Proposed Methodology for Inland water sampling The samples for qualitative and quantitative analysis of planktons were collected from the sub surface layer at knee depth. Water samples were filtered through plankton net of 20µ mesh size (APHA, 1971). The filtered samples were concentrated by using the centrifuge. By using Lackey's drops method and light microscope (Lackey, 1938), the quantitative analysis was carried out for phytoplankton and zooplankton. The standard flora and other literature were followed for the qualitative evaluation of Plankton (Welch 1948; Vollenweider, 1969; Edmondson, 1974).

Table 3.16: Proposed Mode of data collection & parameters considered during the survey

Aspect	**Data**	**Proposed 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 Kashmir , available published literatures like – Biodiversity and Environment Management and available publishes papers of scholars	Floral and Faunal diversity and study of vegetation, forest type, importance etc.
Aquatic Ecology	Primary data collection	By field survey	Floral and Faunal diversity
	Secondary data collection	From authentic sources like Forests/Wild Life department of Jammu Kashmir , available Published literatures like – Biodiversity and Environment	Floral and Faunal diversity and study of vegetation, forest type, importance etc.

Management and available publishes

papers of scholars.

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 *Albizia lebbeck, Benth., Bauhinia variegata, Linn.,* Celtis tetrandra, Roxb., Salix alba, L. Total 27 species of trees belong to 27 families are enumerated from the study area.

Table 3.17: Trees in the study area

S.No.	***Botanical Name***	***Family***	***Vernacular***
1	*Albizia lebbeck, Benth.*	*Mimosaceae*	*Siris*
2	*Albizia chinensis, (Osbeck) Merr.*	*Mimosaceae*	*Sanura, Ola,*
3	*Acacia nilotica, L.*	*Mimosaceae;*	*Kikar*
4	*Acacia catechu, Willd.*	*Mimosaceae*	*Khair*
5	*Bauhinia variegata, Linn.*	*Caesalpinniaceae*	*Krael*
6	*Bauhinia vahlii, Wight and Arn.*	*Caesalpiniaceae*	*Blungad*
7	*Butea monosperma, (Lam.) Kuntze.*	*Papilionaceae*	*Palah*
8	*Celtis tetrandra, Roxb.*	*Urticaceae*	*Kharak*
9	*.Cordia dichotoma, Forst.*	*Boraginaceae*	*Lasura*

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10	*Dendrocalamus strictus, Nees.*	*- Poaceae*	*Chuanthi*
11	*.Dalbergia sissoo, Roxb.*	*Papilionaceae*	*Tahli*
12	*Erythrina subrosa, Roxb.*	*- Papilionaceae*	*.Thubb*
13	*.Ehertia laevis,*	*Boraginaceae*	*Chamrod*
14	*Ficus hispida, Linn*	*Moraceae*	*Lana*
15	*Grewia serrulata, DC.*	*Tiliaceae*	*Dhamani*
16	*.Leucaena leucocephala, (Lam.) de Wit.*	*Mimosaceae*	*Laseeni*
17	*Moringa oleifera, Lamk.*	*Moringaceae;*	*Suhanjana*
18	*Mitragyna parviflora, Korth.*	*Rubiaceae*	*Sangla*
19	*Pistacia chinensis*	*Anacardiaceae*	*Kakarsinghi;*
20	*Pyrus pashia, Ham.*	*- Rosaceae*	*Kainth*
21	*Quercus semecarpifolia, Smith.*	*- Fagaceae*	*Khrew*
22	*Quercus dilatata, Lindl.*	*Fagaceae*	*Maru*
23	*Salix alba, L.*	*Salicaceae*	*Badhaa*
24	*Sapindus mukorossi, Gaertn*	*Sapindaceae*	*Ritha*
25	*Terminalia bellirica, Roxb*	*Combretaceae*	*Bahera*
26	*Zizyphus mauritiana, Lamk.*	*Rhamnaceae*	*Ber*
27	*.Zizyphus nummularia, W. et A., Prodr*	*Rhamnaceae*	*Fuadi*

Shrubs: Total 14 shrub species belong to 14 families are enumerated from the study area. The shrubs observed in the study area are given in the table.

Table 3.18: Shrubs in the study area

S.No.	Botanical Name	Family	Vernacular	Common Name
1	*Achyranthus aspera Linn.*	*Amaranth aceae*	*Puthkanda*	*Prickly chaff Flower*
2	*Barleria cristata Linn.*	*Acanthaceae*	*Kali Barenker*	*Philippine violet*

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3	*Berberis lyceum Royle*	*Berberida ceae*	*Kaverlli*	*Barberry*
4	*Calotropis proceraR.Br.*	*Asclepid aceae*	*Desi akk.*	*Sodom apple*
5	*Camabis sativa Linn.*	*Cannabaceae*	*Bhang*	*Marijuana*
6	*Carrisa opaca Stapf.*	*Apocyanaceae*	*Garna*	*-*
7	*Clematis buchananiana DC.*	*Ranunculaceae*	*Berkella*	*-*
8	*Colebrookea appositifolia*	*Lamiaceae*	*Chitti Suali Duss*	*Indian Squirrel*

Source:http://www.openaccessscience.com/

Medicinal Plants in the Study Area

Table 3.19: Medicinal Plants in the study area

S.No	***Botanical Name***	***Local Name***	***Families***	***Plant Part***	***Medicinal Uses***
1	*Acacia catechu (Linn.) Wild.*	*Khair*	*Mimosa ceae*	*Stem*	*Source of kattha, which is astringent, digestive and useful in ailments of throat, mouth, gums, cough and diarrhoea.*

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2	*Acacia nilotica (Linn.) Del.*	*Kikar*	*Mimosaceae*	*Pods, bark, flowers, gum, leaves and roots.*	*1. Pods are effective in urinogenital disorders.* *2. Gum is used along with Calotropis procera latex to cure asthma, stop bleeding and urinary & vaginal discharges.* *3. It is also useful in diabetes, cure skin diseases and bleeding piles.*
					4. Flowers are used as tonic in diarrhoea and dysentery.
3	*Achyranthes aspera Linn.*	*Parkanda*	*Amaranthaceae*	*Leaves and Seeds*	*1. The roasted seed powder mixed with honey is given during cough & throat irritations.* *2. Leaf juice is given to*
4	*Adhatoda vasica Nees.*	*Brenkar*	*Acanthaceae*	*Flower and Leaves*	*Flower ash with honey is given to cure whooping cough.*
5	*Aegle marmelos Corr.*	*Bel, Bill*	*Rutaceae*	*Leaf, Fruit and Root.*	*1. The unripe or half-ripe fruits improve appetite and digestion.* *2. The antibiotic activity of the leaf, fruit and root has been confirmed.*

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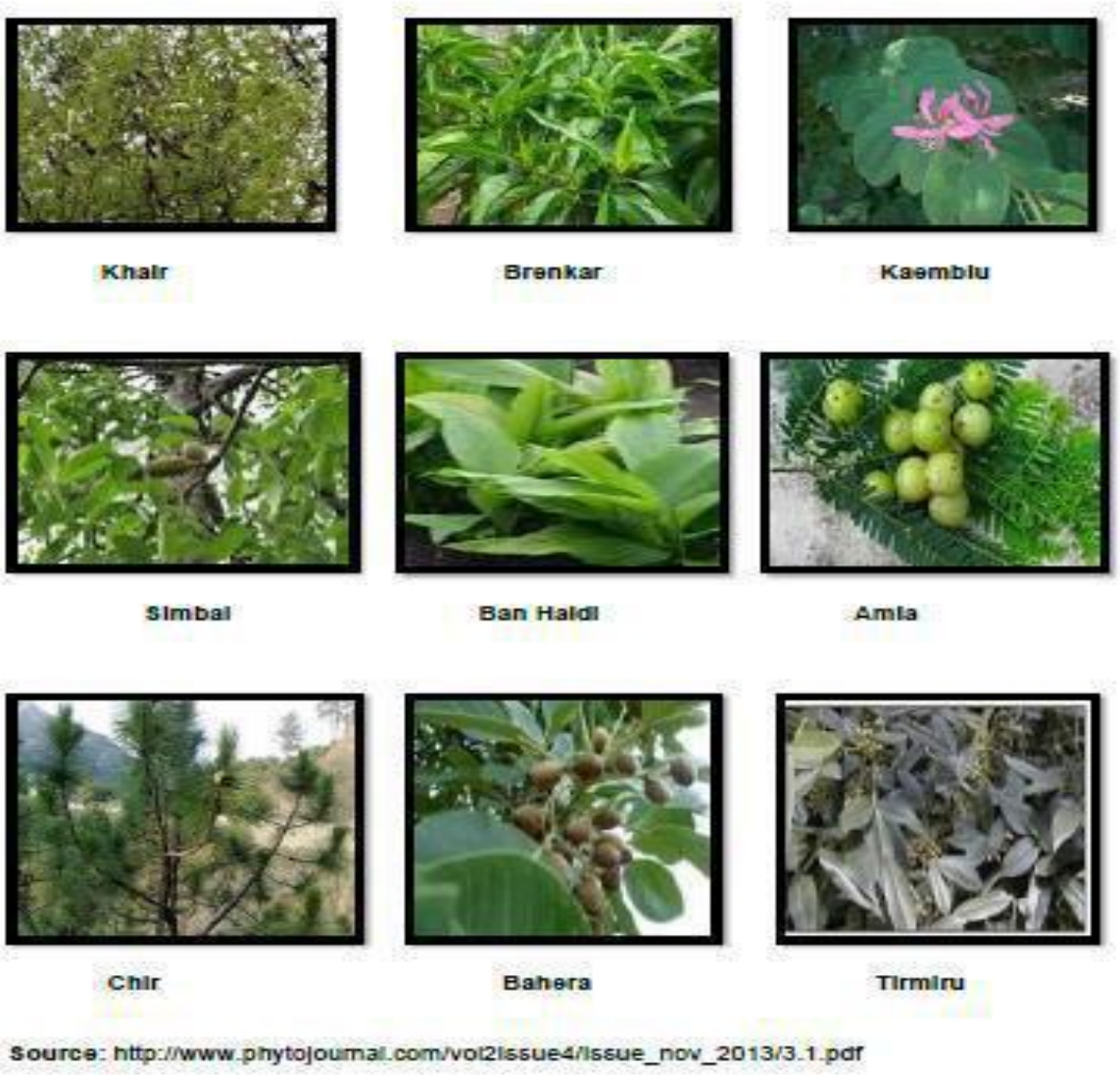

Agriculture/Crop Pattern:

Agriculture land use includes two distant concepts: first is the functional use of land to meet human needs (e.g. agricultural, recreational, and residential) and second is the form of ground cover (e.g. crops, trees, houses). Agriculture regions may be categorized on the basis of land use. District Kathua is also having three crop in combination with rice, wheat and barley as major crops. This part of Jammu division for a part of Great Plains of India and have good climatic condition, irrigation facilities accompanied by rich alluvial soil. Agriculturally this is rich belt of the province.

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Jammu districts ranks first in production of wheat i.e. 48.67% area followed by rice, maize, bajara and pulses which occupies area of 28.87%, 9.9% , 5.91% and4.06% of total cropped area of the district respectively .In Udampur district maize is first ranking crop followed by wheat with 47.37% and 33.26% of the total area in hectare respectively .In districts of Rajouri, Poonch and Doda wheat is the first ranking crop with total of 46.41%,54.92% and 61.81% area under production of maize crop respectively. The reason being climatic conditions and irregular terrain. Reason of rice cultivation being sub tropical type of climatic conditions and plain topography

Table 3.20: Variety of Crops Recommend for District

Crop name	**Details**
Paddy (Dhan)	Gobhi Sarson
Wheat (Gehon)	Oat
Maize (Makka)	Sudan Grass
Pearl Millet (Bajra/Bulrush Millet/Spiked Millet)	Onion
Sorghum (Jowar/Great Millet)	Cabbage
Black Gram (Urd Bean)	Cauliflower
Bengal Gram (Gram/Chick Pea/Kabuli/Chana)	Knol-Khol
Green Gram (Moong Bean/ Moong)	Bitter Gourd
Lentil (Masur)	Bottle Gourd
Groundnut (Pea Nut/Mung Phalli)	Indian Squash (Tinda/Round Melon)
Indian Rapeseed And Mustard (Yellow Sarson)	Brinjal
Raya (Indian Mustard)	Chillies
Sesame (Gingelly/Til)	Bhendi
Sunflower (Suryamukhi)	Tomato
Berseem (Egyptian Clover)	Fenugreek
Rajmash Bean	Spinach
Pea (Vegetable)	Radish
Coriander	Turnip (Saljam)

(Source: http://www.gdckathua.com/pdffolder/currentjournal/AgricultrelandusSingh.pdf)

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Faunal Biodiversity of Study area

The fauna of Jammu and Kashmir is diverse due to its unique location and climatic condition. About 16% of the Indian mammals, birds, reptiles, amphibians and butterflies are presented in the state. Birds contribute much to the chordate diversity following by mammals, reptiles, fishes and amphibians. The state is home to about 75 species of mammals, besides several sub-species, belonging to 54 genera, 21 families and 8 orders. Carnivores represent 32% of the total mammalian fauna in the state. Of the 19 species of the ungulates reported from the state, 13 have been listed as globally threatened.

The avian diversity of the state varies seasonally and available data suggests the existence of as many as 358 species of birds belonging to 179 genera, 51 families under 16 orders. The state is home to 14 species of amphibians belonging to 6 genera, 5 families and 1 order, and 68 species of reptiles belonging to 43 genera, 12 families and 2 orders. The available data suggests that 44 species of fishes belonging to 14 genera under 5 families occur in the state. The available data also reveals that as many as 225 species of insects, besides several sub-species, belonging to 136 genera, 35 families and 4 orders occur in the state

Birds: Some of them even breed in the state. List of species given below:

Table 3.23: List of Birds

S.No	Family	Scientific Name
1	Podicipedidae	Little Grebe
2	Ardeidae	Indian Pond Heron
3	Accipitridae	Pariah Kite
		Black winged Kite
		Indian Shikra
		Indian White Backed Vulture
		Himalayan Griffon Vulture
4	Charadriidae	Red wattled lapwing
		Black Winged Stilt
5	Scolopacidae	Common Sandpiper

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6	Galliformes	Grey Partridge
		Jungle Bush Quail
		Indian Peafowl
7	Columbiforms	Little Brown Dove
		Red Turtle Dove
8	Psittaciformes	Large Indian Parakeet
		Rose Ringed Prakeet
9	Strigidae	Great Horned Owl
10	Coraciidae	Blue Jay
11	Alcedinidae	Small Blue Kingfisher
		Pied Kingfisher
12	Meropidae	Indian small green beer eater
13	Capitonidae	Large Green Barbet
		Blue throated Barbet
14	Picidae	Lesser Golden Backed Woodpecker
15	Lanidae	Rufous-backed shrike
16	Oriolidae	Indian Golden Oriole
17	Dicruridae	Black Drongo
18	Strurnidae	Bank Myna
		Indian Myna
		Starling
19	Corvidae	House Crow
		Himalayan Jungle Crow
		Western spotter forktail
		Blue Throat
20.	Motacillidae	India White Wagtail

Source: Biodiversity and environment Management

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Table3.24: List of Butterflies in the Study Area

Scientific Name	Family	Common Name
Anaphaeis aurota	Fabricius	The Pioneer White or African Caper White butterfly
Aporia leucodice	Eversmann	The Himalayan Blackvein butterfly.
Catopsilia pomana	Fabricius	Lemon Emigrant butterfly
Ceporia nerissa	Fabricius	The Common Gull butterfly

African Caper White butterfly

Lemon Emigrant butterfly

Common Grass Yellow butterfly

The Bath White butterfly

The Common Brimstone butterfly

The White orange tip butterfly

Source: http://www.ijims.com/uploads/f57d6782f9f1d6ba5ca84.pdf

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Table3.26: Fauna found in Study area

S.No	Name	Global IUCN Status	Indian Wildlife protection Act
1	Rhesus Monkey	LR-lc	II
2	Asiatic Jackal	LR-lc	II
3	Indian Fox	LR-nt	II
5	Small Indian Civet	LR-nt	II
6	Common Grey Mongoose	LR-lc	IV
7	Spotted Deer	LR-lc	III
8	Barking Deer	LR-lc	III
9	Wild Boar	LR-lc	III
10	Rufous-Tailed Hare	LR-lc	IV
11	Grey Musk Shrew	LR-lc	V
12	Five Stripped Squirrel	LR-lc	IV
13	Indian Crested Porcupine	LR-lc	IV
14	House Mouse	LR-lc	V
15	House Rat	LR-lc	V
16	Indian Mole Rat	LR-lc	V

LR-lc: Lower Risk-least concern

LR-nt: Lower risk-near threatened

VU: Vulnerable

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Bharal Ladakh

Double humped Camel

Mountain Weasal

Pashmina Goa

White yack col.

Yak

Source:http://www.biodiversityofindia.org/index.php?title=Conser

_status-wise_list_of_mammals

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CHAPTER-4 IMPACTSAND MITIGATION MEASURES

4.0 INTRODUCTION

Human activity affects environment. Environmental parameters (such as Ambient Air Quality, Water quality, Soil, Noise level, Flora and Fauna and Socio-economic status) get affected. It has direct relation with health and hygiene of people. Impact on environment may be adverse or beneficial depends on activities it brings on environment changes in physical, chemical and biological status of air, water, land including biota and in socio-cultural life styles. Regular monitoring is required to know current status of environmental parameters. Mitigation measures are required and suggested once values are exceeding the stipulated limit. The potential impacts are identified in the activities and impact on environmental parameters is noted and mitigation measures are explored and implemented.

On the basis of the impact analysis, the mitigating action and future monitoring requirement are focused in the Environmental Management Plan for counting or minimizing adverse impacts.

The following parameters are of significance in the Environmental Impact Assessment study for the proposed project and are being discussed in this section.

Land Environment
Water Environment
Air Environment
Noise Environment
Biological Environment
Socio-Economic Environment

4.1 LAND ENVIRONMENT

On the River bed**,** the river mining does not carry any overburden/ waste. There is no waste left to manage at the end of mining activity. Further, there is un-mined area left and soil erosion of main land is strengthened by development of plantation/green area. It is assumed that land will be reclaimed its original after replenishment.

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Table 4.1: Proposed Impact and Mitigation Measures

Impact Prediction	**Mitigation Measures**
Obstruction in river flow / course.	Mining of minerals will be started from dip side towards rise at the center and also laterally in 1.0m slice.
Erosion of channel bed and banks.	Unwanted material or spillage (if any) will not be stacked by the side of the excavation voids created. Excavation will be carried out in a manner so that water flow / course will not be obstructed.
Increase in channel slope. Change in channel morphology.	Mining is to be done leaving safety barrier or offset on both sides and maximum barrier should be on concave side of river preferably the flow channel (excavation void created) should be kept straight so as to help avoid erosion as side cutting or collapsing
Impact on stream's physical characteristics, such as channel geometry, bed elevation in	The mine working will remain confined to river bed only and in no case mining will disturb any surface area outside the river bed which may affect topography or drainage.
stream roughness of the bed, flow velocity, discharge capacity, sediment transportation capacity etc.Impact on ecological equilibrium of river-ine regime.	The mining from river bed will not have impact on natural drainage of surrounding areas as the excavated river bed material from river bed is filled with first heavy flow in river during monsoon season. Mining activities will be stopped during monsoon. Further mining activities for the second block will be started after completion of the first block as per schedule of the mining plan. First block will be reclaimed and back filled as per Standards of mine refilling.

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4.2 WATER ENVIRONMENT

Impact Prediction	Mitigation Measures
Flow pattern might be changed due to river bed mining. Mining activities depth will be increased, which may result in increase of flow velocity.	No diversion is proposed. There will not be any adverse impact on flow pattern, surface hydrology and ground water regime. Mining activities will be restricted to 3.0m depth, which will not cause much change in flow pattern of the river. An offset of 20m will be left from both sides of river, which will minimize the chances of bank failure.
Change in surface water quality and ground water quality.	There will be no change in surface water quality as river is seasonal. Ground water quality will not be affected due to mining activities as it is restricted to 3.0m depth and the water level is 6-30 m bgl below the surface of river bed. A safety zone of 45m around the wells will be created and it will be left un-mined. The mining will not be allowed below the water table. Regular monitoring of water samples will be done as precautionary measures**.**
Impact on ground water recharge potential as the thickness of the natural filter materials (sediments) is reduce causing less infiltration.	Mining will be done as per approved Mine Plan and applicable Rules & Regulation, so that there is no damage on ground water recharge potential due to river bed mining.
Waste water discharge.	Portable Bio-tiolets will be used; hence no sewage / liquid effluent will be generated and contamination is also not expected due to percolation.

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4.3 AIR ENVIRONMENT

Mining activities at the proposed site will have adverse impact on Ambient Air Quality. Movement of trucks & dumpers and mining machines, piling, loading and unloading of materials, operation of DG sets are the potential parameters responsible for Air Pollution. Base line value represents Air Quality of the area when there are no project activities. Impact of project activities on Ambient Air Quality are predicted with emission factor of particulate matter and meteorology as input of the model through the Air Quality Dispersion Model discussed in the next section.

Air Quality Impact Prediction (AQIP)

The major sources of air pollution from the mine are dust generation due to loading & transportation of mineral and wind erosion of exposed material. In this present study, United States Environmental Protection Agency (USEPA – 42 series) approved mathematical equations, have been used to predict emission rates for different operations in mining including the mineral transportation. Air dispersion model is the mathematical simulation of air pollutants disperse in atmosphere.

Mathematical model used in modeling for River Bed Mining

The ISCST3 short-term 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. The basis of the model is the straight-line, steady-state Gaussian plume equation, which is used with

some modifications to model simple point source emissions from stacks, emissions from stacks that experience the effects of aerodynamic downwash due to nearby buildings, isolated vents, multiple vents, storage piles, conveyor belts, and the like. 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. At the present scenario, area source model are used to predict Ground Level Concentration of GLC during piling, loading and unloading. The impact of mining activities on the haul road is also worked out and presented in the report. Haul road is divided into small area sources and predicted GLC is given in the report.

The ISC Short Term model accepts hourly meteorological data records to define the conditions for plume rise, transport, diffusion, and deposition. The model estimates the concentration or deposition value for each source and receptor combination for each hour of input meteorology,

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and calculates user-selected short-term averages.

Details of Emissions

The sources of pollutants were identified. Mineral excavation was identified as area source emission, loading and unloading of minerals as point source and transportation routes were identified as line source.

Pollutants / Model Options Considered for Computations

The model simulations deal with major Pollution i.e Particulate Matter ($PM_{2.5}$ & PM_{10}) and Gaseous emissions viz. SO_2 & NO_2.

Meteorological Data

Data recorded by continuous weather monitoring station on wind speed, direction, and temperature at one hour interval for the monitoring period was used as meteorological input to the dispersion model. The data obtained was verified and established from the other authenticated sources like IMD/other Govt. organization. Data for stability classes and mixing height were taken from the secondary sources for this period and used in this model.

4.4 NOISE ENVIRONMENT

Noise is among the major source of pollution generated due to mining activities, movement of instruments, trucks dumpers and DG sets. The potential impact of noise pollution and mitigation measures are discussed below:

Table 4.4: Impact & Mitigation Measures

Impact Prediction	Mitigation Measures
Noise Impact due to mining activities. Noise impact due to vehicular movement. Auditory impact	The noise levels from all these sources are periodical and restricted to particular operation. The noise measurement data indicated that present noise levels in the study area is within the permissible limits of National Ambient Noise Quality Standards. Periodical monitoring of noise will be done. No other equipments accept the transportation vehicles and excavator for loading will be allowed. Noise generated be these equipments will be intermittent and does not cause much adverse impact. Proper maintenance of all equipments / machines will be carried out which help in reducing noise during operations. Plantation will be taken up along the approach roads and river bank. The plantation vicinity of minimizes propagation of noise and also arrests dust. Ear muffs will be provided while working on mining equipments.

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4.5 BIOLOGICAL ENVIRONMENT

The proposed project will do mining activities. It requires infrastructure, temporary road and drainage to conduct mining in the proposed area. These developments will affect socio-economic environment of the area and have potential impact on environment. The potential impact and mitigation measures are discussed below:

Table 4.5: Potential Impact and Management in Biological Environment

Issues	Potential Primary Impact	Management
Temporary road	Short-term disturbance in habitats of wildlife populations from noise (impacts usually local and short-term)	Do not cut trees that are larger in diameter than local regulations permit, or in the absence of regulations, greater than 90 cm. Minimize clearing of vegetation. Leave in place smaller vegetation, topsoil, root stock, seeds and endangered or protected species and species used by local communities for commercial or subsistence use.
Infrastructure	Erosion and changes in surface hydrology. Vegetation cleared, disturbing local habitats.	''Minimize the footprint'', use existing infrastructure to the extent possible to avoid or reduce clearing. In clearing vegetation, use hand-cutting techniques to the extent possible, thereby avoiding the use of heavy machinery.

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Drainage	Erosion and changes in surface hydrology, causing short and possible long	Take topography, natural drainage and site runoff patterns into account. Ensure adequate drainage away from streams,
	term changes in local habitats.	river and other waterways.
Erosion (topsoil loss)	Impedes ability of habitats to revegetate, causing possible long term damage to affected area. Siltation of waterways, with negative impacts on surrounding environments.	Take topography, natural drainage and also site runoff patterns into accounts. Ensure adequate drainage. Stabilize all slopes, revegetating with native species to reduce/avoid erosion. Break-up compacted surfaces and replace topsoil, brash, seed source, leaf litter, etc.
Traffic	Short-term disturbance of habitats from traffic; short-term disturbance of wildlife populations from	Keep traffic to the absolute minimum requirements. Impose and enforce speed limits and provide driving guidelines for vehicle

4.6 SOCIO-ECONOMIC ENVIRONMENT

According to Census of India 2011, the state accommodates a population of 1.25 crore (12,548,926), registering a population density of 124 persons per sq.km and sex ratio of 883. A decrease in the decadal population growth rate of the region has been observed during 1991-2001 (29.4 percent) and 2001-2011 (23.7 percent). Jammu & Kashmir is basically an agrarian state. Agriculture occupies an important place in the economy of the state. The share of agriculture and allied sectors in the Gross state Domestic Product (at 1999-2000 prices) for the year 2010-11 as per preliminary estimates stands at 20.59%. On the other nearly 70% of the population in the state derives its livelihood directly or indirectly from agricultural sector. Agriculture is the main stay of

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the state's economy. The state of is predominantly a mono cropped and rain fed with about 40% of the area in Jammu division and 60% in Kashmir Division having assured means of irrigation. Irrigation is crucial input for development of agriculture in the state. The major area in the state falls under the command of canal irrigation.

Rice, Maize and Wheat are the major crops in the state, while in Kashmir region Wheat, Oil Seeds and Fodder is being introduced as the secondary crop. In Jammu farmers are raising paddy as an additional crop. The production level of paddy adds about 40 quintals per hectare in Kashmir Valley and is highest in the country. River bed material mining activity has impact on socio-economic environment. It has impact on habitation, employment generation, health and culture. Economy of the area is widely affected as project will provide employment opportunity in various activities. River bed materialis used locally for the infrastructure development which has long term effect to generate other developments. Land use statistics is available for 2416 thousand hectares. Over the year land use statistics has not undergone any significant change. The total reporting area as per revenue papers is 2416 thousand hectares for the year 2011-12.

The crop yield for the year 2011-12 regarding principal agriculture crops was estimated to be 1.6 metric tonnes per annum for maize, 2.078 metric tonnes per annum for rice and 1.68 metric tonnes per annum for wheat, which are the major crops of the state.

Description	**As per Census, 2011**
Population	12541302
Population size (Males)	6640662
Population size (Females)	5900640
Population size (Rural)	9108060
Population size (Urban)	3433242
Population size (Rural Males)	4774477
Population size (Rural Females)	4333583
Population size (Urban Males)	1866185
Population size (Urban Females)	1567057
Population density (Total, Persons per sq km)	124
Sex ratio (Females per 1000 males)	889

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Sex ratio (Rural)	908
Sex ratio (Urban)	840
Percentage of Literacy	68.74%
GDP at constant (2004-05) prices	17.10% (2012-13)

Table 4.6: Potential Impact and Management in Socio-economic Environment

Aspects	Impacts	Mitigation Measures
Habitation	No loss of habitation.	The nearest habitation is beyond 1.0 km. All necessary measures are being taken, so that there is no disturbance to the normal life of persons.
Employment Generation	Direct employment to 13persons. Improved income expenditure. Improved micro investments – savings patterns.	Local people will be employed. Training will be provided to non-workers and unskilled workers. Awareness program to motivate people for savings and investment.
Health Implications	No health related problems were reported during the rimary survey. No significant health mplications to the workers due to mining activities.	Regular health camps will be organized for the local people. Adequate number of medical facilities are situated in the area the nearest being Sub District Hospital
Health impacts – on mental, physical, and social well-being.	The proposed project will not adversely impact the mental, physical and social well-being. It will improve the well-being of the	Expectations in fair pay, employee care, social responsibility commitments etc. will be timely met. Grievance redressal mechanism is made to handle complaints from the study area.

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Loss / gain of self esteem	A rise in the self-esteem due to increase rate of economic growth in the region. Higher degree of	Immigration in search of employment will be controlled.

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CHAPTER 5 ANALYSIS OF ALTERNATIVES

(SITE & TECHNOLOGY)

5.0 INTRODUCTION

Demand of river bed material has increased mainly in infrastructure activities like roads, highways, buildings & townships with the rapid pace of development, the gap between demand supply of material as construction material must be minimized to control the pricing mechanism and support the demand of local market. The price correction in the river bed material rates will definitely provide growth impetus to our citizens and as well as to our economy (both directly and indirectly), if it is available legally. Therefore, utilization of mineral through scientific mining methodologies (sustainable mining) at the stretch of river bed in the state of Jammu & Kashmir will support growth in nearby areas and J & K State at large.

5.1 SITE

The propose site for mine lease was allotted to Shri Sanchit Gautam S/o Sh. Ravi Gautam by the Dept. of mines and Geology, Jammu, Govt. of Jammu & Kashmir (Block no 5/9) and area 9.52 ha) in the District Jammu, Jammu & Kashmir. This is site specific project. Alternate site is not possible as proposed site was allotted by the Dept. of Mines & Geology, Govt. of Jammu & Kashmir to the said allottee Shri Sanchit Gautam S/o Sh. Ravi Gautam on the basis of highest royalty for Minor Mineral Mine based on competitive bidding process**.** The site details are discussed in Chapter3 of EIA report and other appropriate sections.

5.2 TECHNOLOGY

The proposed technology was approved by the Director General, Mines and Geology, Govt. of Jammu & Kashmir. Technology will not change during mining activities. This project is proposed for the excavation of river bed material from the bed of river. It is an opencast semi mechanized mining project to excavate river bed material in its existing form for direct usage as a construction material. Excavation will be carried out in River bed up to a depth of 3.0 m or 1.0 m above the ground water table or whichever is less by using light weight excavators. Year wise proposed production details as per approved Mining Plan are given below:-

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Year	ROM in River (Tone)
I	86,100
II	86,100
III	86,100
IV	86,100
V	86,100
Total	**4,30,500**

\Source: Approved Mining Plan

5.2.1 MINING METHODOLOGY

As per Jammu & Kashmir Minor Mineral Concession Rule - 1962 (State Rules) and amendments extraction of river bed material in bench mode will be limited to 3.0 m depth, width will be approx. 20 m and bench will advance parallel to the bank of the river. Extraction activities will start in the blocks from the upstream to downstream side. This will not obstruct the movement of water, if any, during monsoon period in the river course. Roads in the lease area for the movement of loaded tippers/ trucks will not have slopes more than 1 in 20. Roads will be properly maintained and water sprinkling will be done for dust suppression. Every block will have its own approach road, which already exist and is well connected to main highways. Light weight excavators will be used for loading of mineral in tippers/trucks.

5.3 CONCEPTUAL MINING PLAN

The digging depth will be restricted to 3.0 m only or 1.0 m above the ground water table. This will be further get replenished during the rainy season. The deposit in the river bed will never exhaust. The material will be regularly replenished during floods by the action of river water. The following steps will be taken care in mining:

Pit limit at the end of lease period

Sites of disposal of waste rock and top soil at the end of lease period

No top soil or waste will be generated in the mining as such no disposal of waste is needed.

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The existing and in next five years of mining degradation of land will be as below:-

Particulars	**Present land use**
Quarry	8.54
Infrastructure	0.00
Dumps	0.00
Buffer Zone of 7.5m	0.98
Total	**9.52**

Table 5.2: Land use pattern

Proposed infrastructure, water supply, manpower and basic amenities

Table 5.3: Facilities and Details

Facilities	**Details**
Proposed Basic Amenities will be provided to workers at the mine site during operational phase.	Rest room shelter/Tents, first-aid facility, PP-temporary structure office and Portable Bio-toilets, etc
Power requirement	Only day time Mining operations will be carried out, hence No Electricity is required.
Nearest source of Water supply & Demand	Daily water demand is assumed as 20.62 KLD .
Manpower Requirement	Total employment in the Mining activities will be around 13.People and local villagers will be preferred for skilled and non-skilled jobs after training. Poor section of society will be benefitted from the project.

5.4 CONCLUSION

Analysis of alternate site /technology is not possible as proposed site was allotted by the Director General, Mines and Geology, Govt. of Jammu & Kashmir. Mining plan is approved by the competent authority. Change in site and technology are not applicable for the proposed project.

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CHAPTER6 ENVIRONMENTAL MONITORING PROGRAMME

6.0 INTRODUCTION

Regular monitoring of environmental parameters is of immense importance to assess the status of environment during project operation. The knowledge of baseline conditions comes through monitoring of environmental parameters; the monitoring program will serve as an indicator for environmental conditions due to operation of the project. Monitoring is an important tool for the management, environmentalist and policy maker to make changes in pollution control equipments, environmental policy to save environment. It is decision making tool for the state of environment carried out through periodic monitoring. Further, impact assessment study is carried over short period of time and the data cannot bring out all variations induced by the natural or human activities. Therefore, regular monitoring program of the environmental parameters is essential to take into account the changes in the environmental quality over the period of time to comply environmental conditions necessary to save environment.

6.1 ENVIRONMENTAL MONITORING AND REPORTING PROCEDURE

Monitoring will conform to commitments and compliances. This may take the form of direct measurement and recording of quantitative information, such as amount and concentrations of discharges. The objectives of the monitoring are:-

Very effectiveness of planning decisions;
Measure effectiveness of operational procedures;
Conform statutory and corporate compliance; and
Identify unexpected changes.

6.2 ENVIRONMENTAL MONITORING CELL

A centralized Environmental Monitoring Cell will be established for monitoring of important and crucial environmental parameters which are of immense importance to assess the status of environment during mine operation. With the knowledge of initial parameters, deviations in environmental conditions due to operation of the mine will be assessed and mitigation steps will be taken to safeguard the environment. The routine monitoring program will be implemented under the project monitoring as per CPCB & MoEF & CC guidelines. Officer not below the rank of

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General Manager will be responsible of Environmental Management Cell and execution of environmental monitoring program.

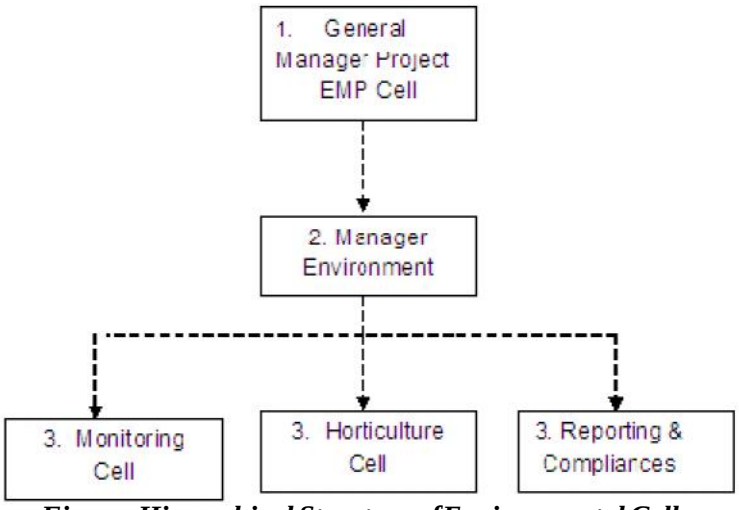

Figure: Hierarchical Structure of Environmental Cell

The core responsibilities of the Environmental Monitoring Cell will be:-

The organization and interpretation of the environmental monitoring data to establish a record of change associated with the implementation of a project or the operation of an organization.

The process of verification that all or selected parameters measured by Environmental Monitoring Program are in compliance with regulatory requirements, internal policies and standards, and established environmental quality performance limits.

Assessment of the effective environmental management system, practices and procedures.

The environmental monitoring and audit work will be carried out by qualified personnel.

A summary of non-compliance of the environmental quality performance limits.

To implement and monitor the control and protective measures based on the EMP.

To coordinate the environment related activities to the top management within as well as with outside concerned agencies.

To provide of health check up of workers and the people living in nearby villages.

To develop greenbelt in the nearby villages, schools, Govt. offices and transportation routes.

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6.3 ENVIRONMENTAL MONITORING SCHEDULE

Environmental monitoring schedules will be prepared covering various phases of project advancement, such as Mining and regular operational phase. Environmental Monitoring Program will be conducted once in season except monsoon.

Table 6.1 Proposed Environmental Parameter and Frequency

S.No.	Potential Impact	Parameters for Monitoring	Frequency of Monitoring	Location
	Air Emission	PM_{10}, $PM_{2.5}$, SO_2, NO_x& CO	As per CPCB / MoEF & CC requirement i.e. 24 hourly monitoring for one month in each season expect monsoon season.	Two locations in the core mining area and four in buffer area
	Noise	Spot Noise level recording Leq (day), Leq (night), Leq (dn)	Periodic / As per CPCB norms i.e. quarterly	One locations in the core mining area and four in buffer area
	Water Quality	As per drinking waterstandards	Once in aseason expect monsoon season.	One locations in the core mining area and four in buffer area
	Soil Quality	Analyzed as CPCB method	Once in a season except monsoon.	Two locations in core andtwo in the buffer area.
	Health	Total health parameters	Initial Medical Examination (IME) and Periodic Medical Examination – Once in a five year as per Mines Rules, 1955.	All employees

6.4 MONITORING SCHEDULE

During operational phase, dust and particulate matter will be the main pollutant which arises from different mining activities. The major attributes based on regular monitoring, environmental setting and nature of project activities are listed below:

Source emission and ambient air quality;

Ground water levels and ground water quality;

Water and waste water quality;

Soilquality - Once in season;

Noise levels (equipment and machinery noise levels, occupational exposures and Ambient noise levels)

Ecological preservation and a forestation

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6.5 MONITORING PARAMETERS

Ambient air quality monitoring

Workspace Monitoring

The concentration of air born pollutants in the workspace / work zone environment will be monitored periodically. If concentrations higher than threshold limit values will be observed, the source of fugitive emissions will be identified and necessary measures will be taken as detailed in EMP.

Ambient Air Quality Monitoring

The ground level concentrations of PM_{10}, $PM_{2.5}$, SO_2, NOx and CO in the ambient air will be monitored at regular intervals except monsoon. Monitoring locations will be decided on the meteorology of the area, topography potential of receptors in the core and buffer area locations. Any abnormal rise will be investigated to identify the causes. Greenbelt will be developed for minimizing dust propagation.

Monitoring of water quality

Objective of Water Monitoring are as follows:

To observe the change in water table of the area;

To assess Ground Water Quality in operation phase of project;

To suggest mitigation if required to improve ground water quality;

To study Ground water table to help environmental planners, developers and management.

The monitoring of groundwater is the most important tool to find out the depletion in level of water table. Water table will be monitored at regular interval to check the behavior pattern of the water table. It is suggested to collect water samples and analyze. Records of analysis will be maintained.

Monitoring noise levels

Potential receptors of Noise levels in the core and buffer areas are identified based on the present noise levels and proposed increment. Noise levels in the work zone environment shall be monitored. The frequency will be once in three months (one season) in the work zone. Noise monitoring will be conducted in three seasons except monsoon with monitoring frequency once in a season carried on hourly basis for 24-h representing site, human settlements, close to high ways, commercial and residential areas and for the industrial area (if any). Similarly, ambient noise

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levels near habitations will also be monitored once in three months. Audiometric tests will be conducted periodically for the employees working close to the high noise sources

Reporting schedules of the reporting data

It is proposed that voluntary reporting of environmental performance with reference to the EMP will be undertaken. The Environmental Monitoring Cell will co-ordinate all monitoring programs at site and data thus generated will be regularly furnished to the State regulatory agencies/ State Pollution Control Board at the frequency of six month. The Environmental audit reports will be prepared for the entire year of operations and will be regularly submitted to regulatory authorities.

Conclusion

Post Environmental monitoring is an essential step in the EIA process to validate the model results with monitored data and establish relation between them. It helps environmental planners, policy makers, scientists and technologists to make amendment in them to save environment through mitigation measures and apply of clean technology. Mitigation may be in form of technology up-gradation, design modification or modification in environmental policy. Environment works on cause -and -effect relationship. Clean mining activity will be required for sustainable growth.

The Environmental Monitoring Cell will co-ordinate all monitoring program, environmental awareness program and its importance in proposed project at site. Data generated will be furnished as per statutory requirements laid down in CTE/CTO and the environmental conditions. The frequency of monitoring will be one month in each season except monsoon. Half yearly report will be submitted on June and January of each year to the Regional Office of MoEF&CC, Jammu and Kashmir. The Environmental audit reports will be prepared for the entire year of operations and will be regularly submitted to regulatory authorities. Objective of entire process will be to improve environment and reduce the impact of project / project activities on environment.

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CHAPTER7ADDITIONAL STUDIES

7.0 RISK ANALYSIS AND DISASTER MANAGEMENT PLAN

Risk goes in parallel with development. Risk is associated type of development activities. It is sector specific and each sector has its specific risk and mitigation. Identification of risk and its potential of hazards is the part of study which will be on-site and off –site. Risk analysis and disaster management is discussed in this section.

The possible risks in the case of river bed mining project are bank erosion, floods, accidents due to transportation etc. Mining and allied activities are associated with several potential hazards to both the employees and public at large. A worker in a mine should be able to work under adequately safe and healthy condition. This is possible only when there is adequate safety in mines. Safety of the mine and the employees is taken care of by the Mining Rules & Regulations, which are well defined with laid down procedure for safety, which when scrupulously followed safety is ensured not only to manpower but also to machines & working environment.

7.1 RISK ANALYSIS

Risk analysis is the systematic study of uncertainties and risks encountered in various areas in the proposed project. Risk analysis identifies the risks involved in mining operations and related activities. In this Chapter of EIA report, the types of risk involved, risk potential and impact on environment, lives and property will be discussed. The potential of impacts in the proposed project is to understand how and when it arises, and estimates the impact (financial or otherwise) of adverse outcomes. It also defines and analyzes the dangers to individuals, businesses and Government posed by potential natural and human-caused adverse events.

7.2 RISK AND HAZARDS IN RIVER BED MATERIALMINING

River bed material mining is done by open cast semi-mechanized method. There is no land degradation due to mining activities as mining is done only on river bed surface. There will be no Over Burden (OB) or waste generation as the river bed materialis exposed in the river bed. There will be neither any stacking of soil nor creation of OB dumps. The solid waste management in the River Bed Mining project is ruled out.

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However, there are various factors, which can create unsafe working conditions/ hazards in mining of river bed material (minor minerals) from river bed. The following types of hazards are identified during the river bed mining operations:-

Accident during river bed material loading, transportation and dumping

Accident due to vehicular movement

Inundation/ Flooding

Quick Sand Condition

Mitigation measures

Measures to prevent accidents during loading

The following activities will be done to minimize the risk are:-

At the time of loading no person will be there within the swing radius of the excavator.

The dumpers/ trucks will stand near the loading equipment and fully braked when the muck is filled in it.

The truck would be brought to a lower level so that the loading operation suits to the ergonomic condition of the workers.

The workers will be provided with gloves and safety shoes during loading.

Opening of the side covers (pattas) should be done carefully and with warning to prevent injury to the loaders.

Mining activities in daylight only.

Measures to prevent accidents during vehicular movement & transportation

The following activities will be done to minimize the risk are:-

The truck will be covered with tarpaulin and maintained to prevent any spillage.

To avoid danger while reversing the trackless vehicles especially at the embankment and tipping points, all areas for reversing of Lorries should be made man free as far as possible.

The vehicles must be maintained in good conditions and checked thoroughly at leastonce in a week.

All transportation within the main working will be carried out directly under the supervision and control of the management.

Overloading should not be permitted and the maximum permissible speed limit should be ensured.

The truck drivers should have proper driving license.

Astatutory provision of the fences, constant education, training etc. will go a long way

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in reducing the incidents of such accidents

Measures to prevent incidents during Inundation/ Flooding

The following activities will be done to minimize the risk are:-

During monsoon months and heavy rains the mining operations are ceased.

There should be mechanism/ warning system of heavy rains and discharges from the Up-stream of water.

Inundation of flooding is expected and beneficial for these mines as during this time only the mineral reserve gets replenished

Precautionary Measure for Sudden Release of Water from Upstream Dam

The following activities will be done to minimize the risk are:-

The mining should be done only during the dry season and under strict supervision

Mining activities should be avoided during monsoon season.

No go zones should be clearly marked and made aware to the mine workers.

Deep water areas must be identified.

Measures to prevent sudden increase in water level

The following activities will be done to minimize the risk are:-

The mining activities will be restricted to 3m depth from river bed surface.

Mining activities will be avoided during monsoon season.

Mining will be done as per the approved Mining Plan and it will be ensured toavoid the pounding effect.

7.3 DISASTER MANAGEMENT PLAN

This should deal with action plan for high risk accidents like Landslides, Earthquakes, subsidence, Avalanches & Snow Blizzards, Drought, Wind Strom, Cloudburst, flood, inundation, fire, seismic

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activities, tailing dam failures etc. and emergency plan proposed for quick evacuation, ameliorative measures to be taken etc. The capability of lessee to meet such eventualities and the assistance to be required from the local authorities should be described.

The shallow depth of activities in river bed mining will not involve any high risk accident due to side falls/collapse.

The complete mining operation will be carried out under the Management and control of experienced and qualified Mines Manager having Certificate of Competency to manage the mines granted by DGMS.

All the provisions of Mines Act 1952, MMR 1961 and Mines Rules 1955 and other laws applicable to mine will strictly be complied with.

During heavy rainfall the mining activities will be closed.

All persons in supervisory capacity will be provided with proper communication facilities.

Proper coordination with Irrigation Department will be maintained so that at the time of releasing water, if any, from the dam suitable warning/information is given in advance.

Disaster Warning System" as developed will be strictly implemented.

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 in mining activities 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 hazards due to river bed mining mainly comes under the physical hazards.Possible physical hazards are as below mention:-

Physical hazards due to mining operations

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Following health related hazards were indentified due to riverbed river bed mining operationsto the workers:-

Light: - The workers may be exposed to the risk of poor illumination or excessive brightness. The effects are eye strain, headache, eye pain and lachrymator, congestion around the cornea and eye fatigue.

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 40^{o} C or above in the river bed mining area.

Eye Irritation: - During the high windy days in summer the sand could be the problems for eyes like itching and watering of eyes.

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.

Noise Induced Hearing Loss: - Machinery is the main source of noise pollution at the mine site.

Management of health hazards

Table 7.1: Management of Health Hazards

Particulars	**Control Measures**
Heat & Light	The mine site will have adequate drinking water supply so that workers do not get dehydration. Lightweight and loose fitting clothes having light colors will be preferred to wear. Rigorous exercise and more physical activities will be avoided in hot weather.
Noise	Noise exposure measurements will be taken to determine the need for noise

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	control strategies. The personal protective equipment will be provided for each mine workers. Supervisor will be instructed for reporting any problems with hearing protectors or noise control equipment. At noisy working activity, exposure time will be minimized. Machineries will be labeled with noise levels.
Respiratory	PPE like face mask etc. will be provided during mining activity. Periodic medical examinations will be provided for all workers. Awareness program will be organized for workers.

River Bed Area vis-à-vis Sedimentation

7.4 REPLENISHMENT STUDY

Sedimentation- In the geological sciences is a process of deposition of a solid material from a state of suspension or solution in a fluid (usually air or water). Broadly defined it also includes deposits from glacial ice and those materials collected under the impetus of gravity alone as in talus deposits, or accumulations of rock debris at the base of cliffs. The term is commonly used as a synonym for sedimentary petrology and sediment logy. Sedimentation is generally considered by geologists in terms of the textures, structures, and fossil content of the deposits lay down in different geographic and geomorphic environments.

The factors which affects the "Computation of Sediment":

Geomorphology & Drainage Pattern: The following geomorphic units plays important role:

Structural Plain

Structural Hill

Structural Ridge

Denudation Ridge & Valley

Plain & Plateau of Gangetic plain

Highly Dissected pediment

Un-dissected pediment

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Distribution of Basin Area River wise (Area in Sq. Km or Sq. Miles)

Drainage System/Pattern of the area (Drainage Density = Km/Sq. Km of River)

7.5 TRAFFIC STUDY

Traffic study measurements were performed at two locations at National Highway-1(A) and metalled road which connects NH- 1A to assess impact on local transport infrastructure due to this mining project. Traffic study measurements were performed at two locations of these stations is marked on the map below. The monitoring was performed in March to June 2019. The Typical Haul Road which is connected to village linked road for Transportation of river bed material connected to the National Highway (NH)

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.

S.no.	**Vehicles distribution**	**Number of vehicles**	**Passenger car unit (PCU)**
		NH-1 A	
1.	Cars	194	1.0
2.	Buses	25	3.0
3.	Two wheelers	2300	0.5
4.	Three wheelers	1565	1.50
5.	Trucks	30	3.0
Total		28815	

Total number of vehicle (PCU)/hour	
39547/24=16	**48 PCU/hr**

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Table7.4: Existing Traffic Scenario & LOS

Road	V (Volume in PCU/hr)	C (Capacity in PCU/hr)	Existing V/C Ratio	LOS
NH-1[A]	1648	4000	0.412	B

V/C	LOS	Performance
0.0-0.2	A	Excellent
0.2-0.4	B	Very Good
0.4-0.6	C	Good/ Average/ Fair
0.6-0.8	D	Poor
0.8-1.0	E	Very Poor

7.6 SOCIO-ECONOMIC IMPACT ASSESSMENT

Introduction

Socio-Economic Impact Assessment (SEIA) refers to systematic analysis of various social and economic characteristics of human being living in a given geographical area. The geographical area is often called Study Area or Impact Area. SEIA is carried out simultaneously with Environment Impact Assessment (EIA). The prime objective of SEIA is to identify and evaluate potential socio-economic and cultural impacts of a proposed development project on the lives and conditions of people, their families and their communities. If the potential impacts are significant and adverse, SEIA assist the developers and other stakeholders to reduce, remove or prevent these impacts from happening. The present study seeks to determine the severity of the socio-economic and cultural impacts due to upcoming river bed mining projects. The objectives of the proposed SEIA study are as follows:

SCOPE OF THE PROPOSED STUDY

To collect baseline data of the study area.

To comprehend socio-economic status of people living in the study area.

To assess likely impact of the project on social and economic life of the people in the study area.

To measure the impact of the project on Quality of life of the people living in the study area.

To ensure sustainability of positive impacts.

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To recommend mitigation measures on adverse impacts.

STUDY AREA

The study area, also known as Impact Area has been defined as sum total of core and buffer area with a radius of ten kilometers from the periphery of the project site. The study area includes all the land marks both natural and manmade. There are 161 villages and one urban area in the study area.

Table 7.7: District and Sub-district wise distribution of Habitations in the Study area

Sr. No.	State	District	Number of Habitations			% to total number of Habitations in the study area
			Villages	Towns	Total	
1	Jammu & Kashmir	Jammu	2	-	2	1.23
			87	-	87	53.70
			58	1	59	36.42
Total			147	1	-	**91.35**

Table 7.8: Broad Land-use Pattern of the Study Area

Sr. No	Description of Land	Estimated Area (Ha)	Percentage to total area
1	Forest Land	2306	6.84
2	Agricultural Land	18800.30	55.74(100)
2(a)	Irrigated Land	10823.70	32.09(57.57)
2(b)	Un-Irrigated	7976.60	23.65(42.43)
3	Cultivable Waste	1636	4.85
4	Barren& Uncultivable land	59	0.17
5	Permanent Pastures and other Grazing Land	2	0.01
6	Land Under Miscellaneous Tree crops etc.,	4	0.01
7	Area under Non-Agricultural Uses	10919.70	32.38
Total		**33727.00**	**100**

Source Census 2011

Note: The figures in bracket indicate percentage to total Agricultural land available in the study area**.**

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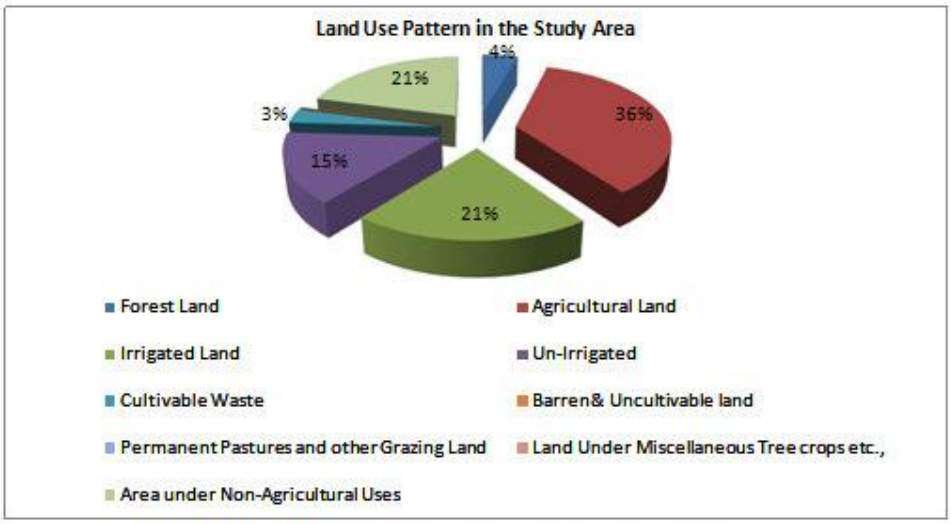

Fig 7.3: Land Use Pattern in the Study Area

HYPOTHESIS

"River bed mining" has significant socio-economic impacts on livelihoods of local communities".

APPROACH

Research approach plays an important role to decide suitable methodology. It helps to develop research design and increase the effectiveness of research study. In the present study inductive approach has been adopted, which is also known as 'bottom top approach' or 'climbing the hill approach'. Under this approach data is first collected from primary and secondary sources. After scrutiny tables are generated in pre-designed formats. Subsequently, draft report is prepared after detail analysis of data. The final report is prepared after incorporating the comments and suggestions of the client.

METHODOLOGY

For impact assessment both primary and secondary data was collected. In the core area primary data was collected through a census cum sample survey, while in the buffer area a sample survey was conducted to collect the primary data. The secondary data was collected from the administrative records, published reports and various websites.

Census-cum sample survey in the core area

Considering that the impact of the project is greatest in the core area and the same diminishes progressively as one move away from the core area to the periphery of the study area, a Census -

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cum Sample survey was conducted in the core area for collection of socio-economic data. It is treated as a census survey as all the villages located in the core area were surveyed for collection of information. Further, in each village a house hold survey was conducted by drawing representative samples from a list of households prepared after complete mapping and listing. Since collection of information from all the households in a village is time consuming and expensive sample survey approach was adopted for collection of information from the selected households in the above villages.

Table 7.10: Demographic Particulars of the Study Area

Source: Census 2011

S.N.	Description	Number	Percentage to Respective totals
1	**Gender wise Total Population of the Study Area**	**132047**	**100**
	Male	69400	52.56
	Female	62647	47.44
	Sex Ratio (No. of females per 1000 males)	903	
	Overall density of population (per sq. km)	**390**	
2	**Sector wise Total Population of the Study Area**	**132047**	**100**
	Rural	124366	94.18
	Urban	7681	5.82
	Density of population in rural areas (per sq. km)	369	
	Density of population in urban areas (per sq. km)	6738	
3	**Gender wise total population in Rural Areas**	**124366**	**100**
	Male	65363	52.56
	Female	59003	47.44
	Sex Ratio in rural area (No. of females per 1000 males)	903	
4	**Gender wise total population in Urban Areas**	**7681**	**100**
	Male	4037	52.56
	Female	3644	47.44
	Sex Ratio in urban area (No. of females per 1000 males)	903	
5	**Gender wise Total Population (0-6 age group)**	**16742**	**100**
	Male	9372	56.0
	Female	7370	44.0
	Sex Ratio of 0-6 age group population (No. of females per 1000 males)	786	

CURRENT SOCIO-ECONOMIC STATUS

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Population Composition

According to 2011 Population Census the study area has a total population of 132047. Of this 52.56 percent are male and the remaining 47.44 percent are female. About 94.18 percent of total population lives in rural areas and the remaining 5.82 percent in Urban area. Further 12.68 percent of the total population belongs to 0-6 age group. About 56 percent of them are male and the remaining 44 percent are female.

Density of Population

The overall density of population in the study area has been worked out to 390 persons per sq. Kilometre. The sector wise density of population of the study area has been worked out to 369 areas.

Households

There are 26656 households in the study area and the average household size is 6. The highest household size in the study area is 10, which has been recorded.

Literacy Status

All persons aged seven years and above, who can both read and write with understanding in any language including brail are considered as literate. The total number of literate persons in the study area is 89493, which is 67.77 percent of the total population. Of the total number of literate persons 56.39 percent are male and the remaining 43.61 percent are female. In the rural areas the number of literate people is 84152, out of which 56.40 percent are male and 43.60 percent are female. The total number of literate persons in the urban area of study area is 5341, which comprises of 56.21 percent of male and 43.79 percent of female.

AMENITIES

Based on information collected from secondary sources various amenities available in the study area are provided in the table below.

Table 7.11: Details of amenities available in the Study Area

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Sr.No	Description	Number of habitations where the facility is available		Number of institutions/facilities available	
		Villages	**Towns**	**Villages**	**Towns**
A	**INSTITUTIONAL EDUCATIONAL FACILITIES**				
1(a)	Only Govt pre-primary schools	1	-	1	-
1(b)	Only Private pre-primary schools	120	-	217	-
1(c)	Both Govt and private pre-primary schools	1	-	5	-
1(d)	No pre-primary schools	35	-	-	-
Total Pre-primary schools		**157**	**--**	**223**	**-**
2(a)	Only Govt primary schools	94	-	113	-
2(b)	Only Private primary schools	6	-	6	-
2(c)	Both Govt and Private primary schools	34	1	111	3
2(d)	No Primary schools	23	-	-	-
Total Primary schools		**157**	**1**	**230**	**3**
3(a)	Only Govt Middle schools	13	-	13	-
3(b)	Only Private Middle schools	10	-	10	-
3(c)	Both Govt and Private Middle schools	6	1	15	4
3(d)	No Middle schools	128	-	-	-
Total Middle schools		**157**	**1**	**38**	**4**
4(a)	Only Govt Secondary schools	12	-	12	-
	schools				

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4(c)	Both Govt and Private Secondary schools	6	1	14	4
4(d)	No Secondary schools	129	-	-	-
Total Secondary schools		**157**	**1**	**36**	**4**
5(a)	Only Govt Senior Secondary schools	5	-	5	-
5(b)	Only Private Senior Secondary schools	5	-	5	-
5(c)	Both Govt and Private Senior Secondary schools	2	1	4	2
5(d)	No Senior Secondary Schools	145	-	-	-
Total Senior Secondary schools		**157**	**1**	**14**	**2**
Total no. of Educational Institutions				**541**	**13**
(B) HEALTH FACILITIES					
1	Community Health Centre	1	-	1	-
2	Primary Health Centre	11	-	11	-
3	Primary Health Sub Centre	14	-	14	-

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4	Allopathic Hospital	-	1	-	**1(8)**
5	Dispensary	12	-	12	-
6	Veterinary Hospital	11	1	11	**1**
7	Non Government Medical facilities for Out Patients	123	-	267	-
8	Non Government Medical facilities for In and Out Patients	1	-	1	-
Total for Institutional Health Facilities				**317**	**2 (8)**
(C) Medical Personnel					
1	**Community Health Centre**				
1(a)	Total Strength of doctors	1	-	4	-
1(b)	Total Strength of Paramedical staff	1	-	7	-
2	**Primary Health Centre**				
2(a)	Total strength of doctors	11	-	16	-
2(b)	Total strength of paramedical staff	11	-	36	-
3	**Primary Health Sub Centre**				
3(a)	Total Strength of doctors	14	-	23	-

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3(b)	Total strength of paramedical staff	14	-	43	-
4	**Allopathic Hospital**				
4(a)	Total Strength of doctors	1	1	2	2
4(b)	Total strength of Paramedical staff	1	1	6	6
5	**Dispensary**				
5(a)	Total Strength of doctors	6	-	6	-
5(b)	Total strength of Paramedical staff	12	-	22	-
6	**Veterinary Hospital**				
6(a)	Total Strength of doctors	11	1	14	1
6(b)	Total strength of Paramedical staff	10	1	17	4
Total strength of medical personnel				**196**	**13**
7	**Qualified and non qualified medical practitioners**				
1	Non Government Medical Practitioner with MBBS Degree	1	-	2	-
2	Non Government Medical	97	-	201	-

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	Practitioner with other Degree				
3	Non Government Traditional Practitioner and faith healer	6	-	8	-
Total no. of qualified and non qualified Medical Practitioners		**104**		**211**	
8	**Other medical facilities**				
1	Non Government Medical facilities - Medicine Shop	17	-	42	-
2	Non Government Medical facilities Others	2	-	4	-

Source: Census 2011

Scope for promotion of boulder, gravel and sand based industries in the study area.

With increased supply of river bed minerals in the region the prospective entrepreneurs shall have the opportunity to set up sand, gravel and boulder based industrial units for manufacturing ResinCoated *Sand for use in foundries*, Sheet/Flat glass, sand bags, bricks, paints etc. This will generate additional employment opportunities for jobless in the region. This is a positive impact of the project.

Scope for development and maintenance of roads in the area

Movement of trucks, dumpers and other vehicles to and fro the quarry sites is expected to increase substantially, when both the mines will start operating. The existing approach roads connecting the quarry with the national and state highways are narrow and uneven. There will be mud slides and traffic bottle necks if the road is not widened and their surface conditions are not improved to support heavy truck dumper traffic. Hence, there is a good scope for development and maintenance of roads in the area. This is a positive impact of the project.

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Flood control & protection to life and property

The study area lies on river bed. Due to mining activity the depth of the river will increase resulting to increase in water holding capacity of the river. Hence, during rainy season there will be fewer chances of floods causing loss of life and property.

Improvement in quality of life of the local people

The quality of life of people in a region depends on per capita income, purchasing power, employment opportunities, infrastructure development, industry, trade & commerce, housing conditions, education, health facilities etc. The upcoming mining project will throw employment opportunities for about 14 people. After the implementation of the project the employment situation in the area is expected to improve marginally. This will have multiple effects on household income of all those families who will get employment in the above mining project. Further, the enhanced income will increase the purchasing power of the above households and at the same time their consumption pattern and living style. Thus the proposed mining Project is an attempt to uplift the Quality of life of the local people.

Impact on state income

The upcoming mining project will make positive impact on state's economy as state's revenue will increase due to higher collection of royalty, dead rent, taxes and fees. It is a positive and direct impact of the project on State's Income.

Impact on health

Mining is always a health hazard and extraction of Boulder, Gravel and Sand is no exception to that. The major health problem originates from mining of river bed material is the generation of dust and other pollutants. It exposes communities to airborne particulate matter that damages lungs of infants, children, elderly persons and those who have chronic health problems. Hence, emission of dust and other pollutants must be checked when the mines start operating, otherwise it will lead to permanent respiratory diseases.

Table 7.13: Social & Economic impacts of River Bed Mining Project

Sr. No.	Description	Impact Type		
		Positive Impact	Negative Impact	No Impact

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		Direct	**In-direct**	**Direct**	**In-direct**	
1	Population Composition	-	-	-	-	Yes
2	Formal Employment Generation	Yes	-	-	-	-
3	Informal Employment Generation	Yes	-	-	-	-
4	Increased Supply of river bed materialfor end users	Yes	-	-	-	-
5	Scope for promotion of river bed material based industries in the study area.	-	Yes	-	-	-
6	Scope for development and maintenance of roads in the area	-	Yes	-	-	-
7	Impact on Agriculture	-	-	-	-	Yes

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Suggestions

The Public opinion is in favour of community health programme under which the mine operators should be encouraged to invest in building of healthcare infrastructure like hospitals, clinics, health education resources, emergency response personnel and equipment, doctors, nurses and hygienists. Furnished below are few steps need to be taken by the mine operator to meet any health hazard during the course of mining practices.

Safe work environment

The project proponent must ensure health and safety of all the employees at work. He must maintain safe work environment and ensure that the machinery and equipment in use are safe for his employees. Further, he must make sure that work arrangements are non-hazardous to employees.

Provision of first aid

The project proponent must make provision for First Aid and the persons providing first aid are well trained in handling patients working in mines.

Regular health examination

For all the mine workers periodical medical examination as per Mines Rule 1955 must be made compulsory. The regular health examination must cover treatment of serious back injury; existing asthma or respiratory diseases, existing skin diseases, lung function test (pre and post ventolin), Audiograms, Chest X- ray etc.

No work for temporal disabilities

The workers having temporary disability will stop doing the job till he/she recovers from disabilities.

Tie up with the nearest hospital for medical help

To meet the medical needs of the mine workers the project proponent shall tie-up with nearest hospitals. Efforts must be made to reserve few beds in the above hospitals for the workers of the upcoming mining project. This will ensure timely medical aid to the affected persons.

Supply of mask, gloves etc

The workers in the river bed mines are subject to respiratory diseases. For protection from dust it must be made compulsory for all workers to wear masks and gloves, while working in a mine.

Administration of anti-venom injections

Provision of Anti-venom therapy must be made available for administration to the workers in case of snake, spider and insect bites, while working in the mine.

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Special telephone number

A special telephone number shall be made available to the workers in case of emergency so that they can dial the same for medical assistances. Further, efforts may be made to provide vehicles to the patients in short duration for shifting to the health institutions.

Special group insurance scheme

All the mine workers must be covered under a Group Insurance Scheme of LIC or any other Insurance company to achieve economic objectives and social obligations.

Perception of local people

During the course of site visit people living in the nearby villages were requested to express their views about the two up-coming mining projects in district Kathua in Jammu & Kashmir. Irrespective of the distance of the villages from the mining site they all supported it. They stated that it should be given top priority as the entire construction industry is depended on adequate supply of Sand, Gravel and Boulder in time. However, people living in the study area stated that extraction of minerals will be allowed with the following conditions:

All the persons to be deployed for extraction of river bed materialshould be recruited locally from villages near mine lease areas and in no case outsiders be engaged for the purpose.

Mining should be allowed strictly during day time and there should be no mining activity after the sun set.

There should not be any pilling of river bed material and other minerals outside the lease area for deferred sale. The piling of river material and other minerals create environment pollution.

The mud road connecting the quarry with the Tar road should be well maintained and there should not be any pothole or uneven surface. This will ensure speedy transportation of river bed materialand other minor minerals from the quarry to the end users.

The local communities must be involved while implementing the CSR activities.

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7.8 PUBLIC HEARING

EIA Notification 2006 of MoEF & CC vide S.O.1533 dated 14th Sept. 2006, the project falls at serial no. 1(a) Category B requires Environmental Clearance from MoEF & CC. The Public Hearing is the part of Environmental Clearance process. Public consultation is considered and incorporated into the EIA final report under standard guideline as discussed in MoEF & CC notification 2006 and amendments.

Public hearing is very significant part of the process of public participation envisaged under the guidelines issued by MoEF & CC, Government of India. It facilitates involvement of all the stake holders of the project which is essential for ensuring smooth running of project and benefitting all sections of society in the process of economic development of the region. This project fall under category B1 and required Public Hearing. In this regard an advertisement for conducting Public Hearing was published on dated 11.01.2020.

In reference to Member Secretary J&K PCB letter no.PCB/T/Mining/Jmu/2020/01/854-62dated06-01-2020, the Divisional Office,J&K Pollution Control Board, and Jammu (North) organized a Public Hearing on11th of February 2020 at 10.00 am onwards at PANCHYAT GHAR KATHAR TEHSIL AKHNOOR, DISTRICT JAMMU. The public hearing was conducted for Minor Mineral (River Bed Mining) project at MINOR MINERAL (RIVER BED MINING) PROJECT AT KATHARWALLI KHAD DOWNSTREAM /UPSTREAM MANOH KATHAR BRIDGE, KATHAR KHAD AKHNOOR AND CHAUKI CHAURA DOWNSTREAM CHAGIAL BRIDGE AT VILLAGE KATHAR/MANOA, TEHSIL AKHNOOR AND VILLAGE GANGAL TEHSIL CHAUKI CHAURA, and DISTRICT JAMMU. The blocks for which the Public Hearing was conducted are:

BLOCK NO.33 (5/8), BLOCK NO.34 (5/9), BLOCK NO. 36(5/11), BLOCK NO. 35(5/10) AT VILLAGE KATHAR TEHSIL AKHNOOR , BLOCK NO.38(5/13), BLOCK NO 37 AT VILLAGE MANOA,TEHSIL AKHNOOR AND BLOCK NO 61 (5/36) AT VILLAGE GANGAL TEHSIL CHAUKI-CHAURA DISTRICT JAMMU.

PANEL OF PUBLIC HEARING

1) Sh. Amit Upadhyaya, Tehsildar Akhnoor (nominated by District Magistrate, Jammu).

2) Dr. Syed Nadeem Hussain (IFS), Regional Director, J&K Pollution Control Board, Jammu.

3) Sh. Arshad Nazir Malik, Divisional Officer J&K Pollution Control Board, Jammu (North).

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Final EIA of Riverbed Material of Shri Sanchit Gautam S/o Sh. Ravi Gautam from Khatharwalli Khad Downstream Manoh Khathar Bridge at Block No. 5/9,), area – 9.52 ha, Village- Khathar, Tehsil- Akhnoor & District- Jammu, J&K

OFFICERS IN ATTENDANCE

The following officers from Union Territory of J&K also representing their respective departments were also present at the public hearing:

1. Sh. Dimple Sharma, Field Inspector, J&K PCB Jammu North.

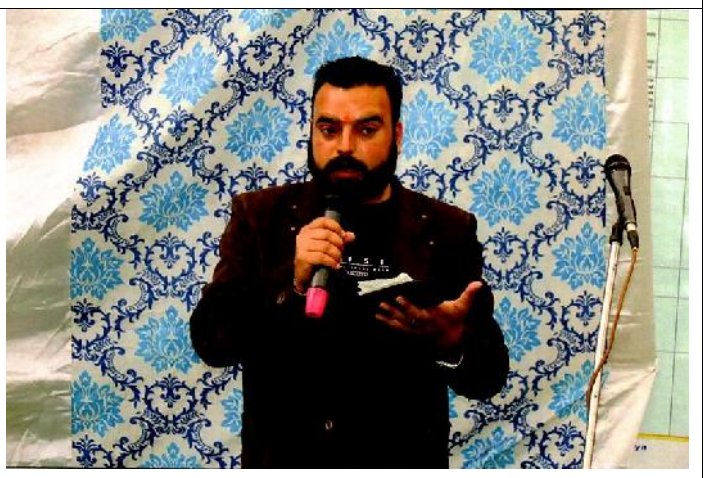
2. Sh. Varinder Singh, Supervisor, Geology & Mining Department, Jammu.

PROCEEDING

The proceeding of public hearing with proof of attendance is attached as ***Annexure***. Photograph of pubic hearing are shown in

Photographs Error! No text of specified style in document.**-1: Photographs of Public Hearing**

J&K POLLUTION CONTROL BOARD, JAMMU-NORTH
PUBLIC HEARING
FOR ENVIRONMENT CLEARENCE OF
MINOR MINERAL (RIVER BED MATERIAL) PROJECT
AT VILLAGE - KHATHAR, TEHSIL - AKHNOOR, DISTRICT - JAMMU (J&K)
Block Numbers:
1. 33(5/8) - (Vill. Khathar)
2. 34(5/9) - (Vill. Khathar)
3. 35(5/11) - (Vill. Khathar)
4. 35(5/10) - (Vill. Khathar)
5. 35(5/13) - (Vill. Khathar)
6. 37 - (Vill. Manoa)
7. 61 (5/35) - (Vill. Gangal)



Block Numbers:
Khathar) 2. 34(5/9) - (Vill. Khathar)
Khathar) 4. 35(5/10) - (Vill. Khathar)
Khathar) 6. 37 - (Vill. Manoa)
61 (5/36) - (Vill. Gangal)

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Name	Query Raised	Reply
Sh. Rohit Sharma (Sarpanch, Khatar)	1- Stressed on the need of planting Minimum 2000 trees per year.	1- Plantation will be done on 33% of lease area as per rules. Plantation will be done along the road side in three layers. The lessee will be maintain to approach road as well as nearby road from lease area. The budget of road maintenance is proposed in CSR.
	2- Demanded repair of 3 to 4 link roads in addition to the approach road to site.	The Lease owner was assure that the only local people will give employment
	3- Wanted assurance that preference shall be given to the locals during the engagement of vehicles and labourers by consultant.	The supply of material to local people on very reasonable price.
	4- Demanded free supply of material to the local people.	The solar light will be proposed in CSR Budget.
	5- Demanded installation of solar light in the village of Khathar.	Proper demarcation of mining width of the blocks in the river by constructing/ installing permanent fencing and putting Flags over the poles will be done.
	6- Demanded proper demarcation of mining width of blocks in the river by constructing / installing permanent fencing and putting flags over the poles.	Agreed
	7- Demanded employing local youths from the panchayat Khathar guards for the management of thetraffic.	Mining will be done only in riverbed area and no mining will be done nearby the land

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	8- Raised demands for retrieving of encroached forest land , providing copy of mining guidelines, development of adjoining local area etc.	
Sh. Deewan Singh (Ex.Armyman, R/O Khathar)	1.Expressed concerns about poor road conditions in the panchyat. 2- Concerned about exceeding depth limits by the contractors in previous year due to illegal mining. 3- Demanded, that all the mining needs to be carried out in a planned and scientific manner. 4- Strongly opposed that no illegal activity shall happen now as was the precedence in the past.	The budget of road maintenance is proposed in CSR. The mining will be done only the depth of 1-3 m only as per mining rules The mining will be done in Planned and scientific manner. The lessee assure that no illegal mining will be done.
Sh. Rashpal Singh Jamwal	1. Stressed for the conservation of forest, Revenue,Government as well as private land. 2. Raised queries about the pollution level in khathar Khad. 3. Complained that 40-50 truckload of illegally mining is happening daily in the khathar Khad. 4. Concerned about Flood Prone Areas of the khathar Khad and advised that those area need to be protected.	Agreed, The lessee assure that the all conservation measures will taken . Agreed, The lessee assure that the all mitigation measures will taken to prevent all impacts of river bed mining No illegal mining will be done Removal of sediments from riverbed area to avoid the floodduring the rainy season. Mining shall be done in scientific manner in allotted riverbed area only.
Sh. Rattan Lal Sharma (Sarpanch,Keur)	Enquired and raised concern about minerals deposited due to floods and the procedure to mine them legally. Also asked regarding the commencement date of the mining projected to be undertaken by the contractor in the khathar Khad.	Removal of sediments from riverbed area to avoid the flood during the rainy season. Mining shall be done in scientific manner in allotted riverbed area only. The mining will be done after getting Environment

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	Complained about the illegal mining underway at present. Stressed that the mining should be done within the proposed limits of 10 m distance from River Stream and up to a maximum depth of 2 m.	Clearance Mining will be done as per rules and regulations
Sh. Rattan Lal (R/O Ward No. 2)	Enquired whether the lift irrigation setups dependent upon the Khad water shall be disturbed or not due to the proposed mining project. Stressed upon consulting the local Panchayats whenever any developmental project is initiated by the government.. Stressed on the demarcation of the mining blocks.	Mining will be done as per rules and regulation No lift irrigation setups dependent upon the Khad water will be disturb due to proposed mining. Proper demarcation of mining width of the blocks in the river by constructing/ installing permanent fencing and putting Flags over the poles will be done.
Smt. Reena Kumari, PanchiChathar	Re-iterated the demand for employment to the local youth of the concerned Panchayat only. Strongly advocated that the outsiders will not be allowed to be engaged in the mining work.	The Lease owner was assure that the only local people will give employment
Sh. Kewal Kumar Sharma, Keur	Raised some queries about acquiring the permission to lift the mining material by the local contractors engaged with Flood Control Department.	The lift of mining material by the local contractor as per rules and regulations.

Sh. Anand Gupta, Environmental Consultant From M/S Globus Environment for the Project Proponent Sh. Nagar Singh Choudhary briefed the gathering about main features of the project including Blocks details, Environment studies done by the their consultancy on behalf of the project proponent, EMP etc. He also shared with the public the measures propose3d to be taken under the EMP. He informed the public that the PP is committed to spend 5% of the profit earned for the general development of the area and for betterment of the local under CSR.

Sh. Arshad Nazir Malik, Divisional Officer, PCB Jammu- North invited voluntary public speakers to put forwards their view, concern and suggestion about the project.

Suggestion/ complaints discussed during course of public hearing at site in favour of proposed project which is as follows:-

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CHAPTER8 PROJECTBENEFITS

8.1 GENERAL

The demand of river bed material has been rising in the state as a result of rising infrastructure.The proposed project aims to fulfill the supply of river bed material. Hence, the fine quality of mineral will be used further for development. The sediment in the form of river bed material (RBM) deposited is of critical importance in civil and other infrastructural activities. The proposed project lies on the river bed. The river bed material is used mainly in the construction activities like buildings, bridges etc. The requirement for the mineral is always high in the nearby cities and towns. Therefore, there is always a good demand of the mineral in the domestic market. The demand in domestic market is increasing with infrastructure growth; hence new areas for river bed material reserves are approached and made operational.

8.2 IMPROVEMENTS IN SOCIO-ECONOMICENVIRONMENT

The proposed project will enhance the socio-economic environment in the adjoining areas.

This will result in following benefits:

Increase in employment potential.

Improvements in physical and social infrastructure

Benefit under CSR policy of the organization

Contribution to the State/ Centre exchequer

Prevention of illegal mining which will help in sustaining the river and its aesthetic value

Post-mining enhancement of green cover under EMP of the project

Scientific method of mining will protect river mining bed and controls foods in river.

These parameters are discussed below:

Employment

Direct employment

During the operational phase, about 13 people will be employed in the proposed project. Considering that some of the skilled personnel to be employed for the project will be from outside the area and unskilled/ semiskilled personnel will be from within the study area, the project will add to the well being of the area. In addition to the workforce the indirect

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employment will also be generated for local persons. It will help in bringing prosperity to the area. Other benefit in the proposed project is business opportunity for the hundreds of people.

Indirect Employment

The project will also provide some indirect employment to the people of nearby area of mine site. Some people will get engaged in some pet shops like tea shop, vehicle repair centre etc. It will also provide some need based opportunity to serve the demand of local public. The project will provide following indirect employment to the local people:

The river bed material available will provide agency employment in the value chain analysis, for place utility and retail.

Transportation and warehousing in the region required to transfer the mineral will eventually be needed and therefore trucks and jobs in logistical activities will come up.

There will be development of externalities for the mine workers petty shops (tea, repair stations for trucks etc.) as supporting services.

As there would be vocational training camps and Technical Training of mining to the regional people, hence there will be potential manpower available for the proposed and surrounding mines of the Tehsil.

This would create Indigenous Technologies for sustainable development.

Improvements in Social Infrastructure

There will be some obvious changes in various environmental parameters due to mining activity. Increase socio-economic activities, creation of new employment opportunities, infra-structural development, better educational and health facilities.

Following are the benefits in specific area of social domain:-

Socio-Economic:- There will be positive impact in socio-economic area due to increased economic activities, creation of new employment opportunities, infrastructural development and better educational and health facilities.

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ECONOMICAL BENEFITS

- Excavation of minerals provides the building materials.
- Generates employment to the locals engaged directly in excavation as well as indirectly transportation and sale of mineral.
- Earns huge sum of revenue in the form of mineral royalty.

Benefit under CSR policy

Corporate social responsibility (CSR) refers to responsibility of a company to ensure positive impact on environment, consumers, employees, communities, stakeholders and all other members of public sphere to contribute fund (2% of project cost) from project benefit for the causes of poverty and social development. It is a new concept in the mining sector and the companies are still going through the learning curve. The CSR activities are increasingly being taken up by the project proponents not only as fulfilling of mandatory provisions but also for the formation and or enhancement of brand image.

BUDGETARY PROVISION FOR CSR ACTIVITIES					
S. No	Particular	Project Stage	Activities	Location	Budget Rs/ Annum
1	Vocational Training to Person for Income Generation	Operational Phase	Local employment will be ensured. On the job training to local people will be given and periodically upgraded	Near by Villages	0.25
2	Assistance to self-help groups	Operational Phase	There is a provision of assistance to local person It looks to build the functional capacity of the poor and the marginalized in the field of employment and income generating activities.	Near by Villages	0.20
3	Construction and Maintenance of Drainage water system	Operational Phase	Construction and Maintenance of Drainage system in the Nearby Villages with the help of Village Panchyat.	Near by Villages	0.17
0					0.58 Lacs

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Budgetary Provision for Corporate Environment Responsibility(CER) Activities(5% of project cost)				**Budget In Rs**				
S. No	Project Activity	Project Stage	Activities	1st Year	2nd Year	3rd Year	4th Year	5th Year
1	Health	Operational Phase	Free Distribution of medicines, health check-up campus in nearby villages	10,000	10,000	5,000	5,000	5,000
2	Electrification including solar power	Operational Phase	Solar Lamp distribution & Solar street light installation in nearby villages	10,000	10,000	10,000	10,000	10,000
3	Education	Operational Phase	Scientific support and awareness to local farmers to increase yield of crop and fdder.	15,000	10,000	10,000	10,000	15,000
Total (5% of the project cost)- Rs. 1.45 Lac				35000	30000	25000	25000	30000

Environment Managementplan

The lease area is in the river bed and devoid of any vegetation. Mining activities will not cause any harm to riparian vegetation cover as the working will not extend beyond the offset left against the banks. Plantation will be carried out as social forestry program in villages, school and the areas allocated by the Panchayat / State authorities.

Plantation has been proposed on both sides of the roads as greenbelt to provide cover against dust dissemination. A massive plantation will be done nearby the mine area to mitigate the ill-effects of mining and to improve environment of its surrounding area.

It is proposed to develop greenbelt as social forestry program in the approach villages at public places like school, PHC's, Panchayat Bhawan with due permission from Panchayat and in consultation with Forest Department. Priority will be given to school and PHC's.

8.3 HEALTH

Periodic medical checkups as per Mines Act / Rules and other social development and promotional activities will be undertaken. All this will assist to lift the general health status of the residents of the area around mines.

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OCCUPATIONAL HEALTH									
S.No	**Project Activity**	**Project Stage**	**Mitigation Measure**	**Location**	**Means of Verification**	**Frequency of Monitoring**	**Responsibility**	**Reporting Requirement**	**Budget (Rs.)/Anum**
1	Occupational Health and Safety Mine Worker (Health, Camps, training etc.)	Operation Phase	Persons working in dusty area to be provided with Protective wears such as helmets, dust masks, ear muffs, Heat Stroke, Continues sitting driving vehicle the Backache. Hearing Loss , Body electrical resistance damage . Regular water sprinkling at dust generating areas, Haul roads. Occupational Health Check-up of all workers working in mine and Pulmonary function test for workers working in dusty areas. Ergonomic factor & noise issue will be taken up during the perches of machine	Mine Site	Visual Assessment, medical test reports and EHS audit	Semester by medical check up	Mines Manger	Monthly Progress Report	Rs. 30,000/-
	Total								30,000

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8.4 OTHER TANGIBLE BENEFITS

The other tangible benefits includes metrics and improvements demonstrating process and system cost savings, compliant inspections and customer audits, faster product approvals and manufacturing throughput, less rejected material, reduced nonconformance issues, and more efficient continuous improvement and project implementation. Intangible benefits include improved staff morale, quick, more accurate and transparent decision making, increased staff accountability and an enhanced culture of quality throughout the organization.

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CHAPTER 9 ENVIRONMENTALCOST&BENEFITANALYSIS

9.0 INTRODUCTION

Development has negative impact on environment. Environmental parameters are under the stress and crossing the limit prescribed by the statutory bodies like SPCB/CPCB/MoEF. Development is essential for the growth of a country. Environment Management is essential for sustainable development. Development and Environment Management are to go ahead in parallel and both are essential and complementary to each other.

River bed material is core component of construction materials in infrastructure development. In the proposed river bed mining project, river bed materialis mining of minerals mined out from the river bed. Rivers are the most important life supporting system of nature. For centuries, humans have been enjoying the natural benefits provided by rivers without understanding much on how the river ecosystem functions and maintains its vitality. Man has changed the nature of many of the world's rivers by controlling their flows, constructing large impoundments, over exploitation of living and non living resources and disposal of wastes. Among these, unscientific and indiscriminate extraction of sand and gravel from riverbed are the rampant activities which are threatening the very existence of the river ecosystem. In order to mitigate the impact of river bed mining on the environment, a scientific assessment is a pre-requisite for framing sustainable development strategies. It is therefore important to tackle the problem for control of pollution and mining of minerals in a cost- effective method causing least damage to the ecosystem. In order to commence/enhance production/ renewal of any mines, it is necessary to obtain Environmental Clearances from the Ministry of Environment and Forests and Climate Change (MoEF & CC), Govt. of India as per EIA Notification 2006.

9.1 PROJECT BENEFITS

Mining on the river bed has following benefits:

The supply of river bed material as a raw material for infrastructure development has a paramount importance. Therefore, the implementation of scientific mining principles through EIA & EMP plays a vital role in sustainable economic growth of our country.

Scientific mining will protect the river bed and stops floods in the river.

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The river bed mining project will create infrastructure in the project area in form of strengthening of existing roads/ new roads from the proposed site to leading National Highway/state high way.

The proposed project will generate employment for the weaker section of people in the society. It creates business opportunity for thousands in the local areas.

9.2 Environmental Costs

Expenditures incurred to prevent, contain, mitigate or remove environmental contamination throughout the life cycle of a product or an activity. These costs include remediation or restoration costs, waste management costs or other compliance and environmental management costs.

Environmental problems	Applicability
On-site effects such as the erosion of riverbanks	Safety zone from river banks will be left
Dust and air pollution due to fugitive air emissions of free silica	Possibility of fugitive emission.
Noise pollution due to movement of heavy machinery and transporting vehicles	Only light earth movers will be used
Riverbanks erosion, soil quality deterioration due to movement of heavy vehicles	Only light earth movers will be used
Spillage of diesel oil from machines and vehicles ,which may pollute the soil and may lease to pollute the ground water	Care will be taken.
Damage to Riparian biodiversity	Elevated sand bars will be scrapped ,so chances decreased of damage
Reduced vegetative banks cover.	River banks plantation is proposed ,soil might increased by end of lease period

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Loss of habitat of the aquatic population	No mining in active channel or in submerged area.
Alteration of flow patterns due to the modification of riverbeds, overloading of suspended sediment	No interference in flow pattern of river proposed
Damage to the channel beds due to the use of heavy equipment	Only light earth movers will be used
Disturbance of the natural hydrology of the riparian zone because of infrequent elevated flow levels	Water flow will remain undisturbed
Drying up of irrigation channels, thus reduced flooding of paddy fields with nutrient-laden water	No disturbance is proposed in existed irrigation channel
Breakout of epidemics leading to loss of life. Expenditure on control of these breakouts, vaccines, medicines, scientific research and quarantining the area.	Project proponent will help the local people.
Off-site effects include the impairment of rural roads, causing damage to the road infrastructure due to heavy loads carried on weak rural roads.	These routes will be periodically repaired.

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Table 9.1: Qualitative Environment Cost Benefit Analysis of Mining in Different Scenarios

Sl. No.	Evaluation Criteria	Complete ban	Restrictaccess to vulnerable sites	Make allowance For environmental trust fund	Illegal Mining	Introduce community based sand mining
A	**Social**					
1	Effect on livelihood	--	0	+	+ +	+ +
2	Effect on health	+ +	+ +	+	--	+
3	Loss of residences	-	+	+	+	0
4	Water for cattle rearing	+	+	+	-	+
5	Loss of domestic utility water	+ +	+ +	+	-	+
6	Pollution of drinking water	+	+	+	-	0
B	**Economic**					
7	Cost of repairing infrastructure	+ +	+ + +	+	-	0
8	Effect on crop production	+	+ +	0	-	+ +
9	Income of mine owners	---	- -	-	+ +	0
10	Income of labourers	---	- -	0	+ +	+
11	Income of sand transporters	---	- -	0	+ +	0
12	Income of building material suppliers	+ + +	+ +	0	-	0
13	Income of building material suppliers (except alternatives to sand)	- - -	-	0	+ + +	-

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14	Cost of river bank conservation	+ +	+	+	-	0
15	Effect on inland fisheries	+ +	+	0	-	0
16	Price of sand	- -	-	0	+ +	0
C	**Environmental**					
17	Loss of biodiversity	+ +	+ +	+	- -	0
18	Loss of riverine vegetation	+ +	+ +	+	- -	0
19	Decline in	0	+ +	0	-	0
	ground water levels					
20	Imbalance In the natural flow system of rivers	- -	+	+	-	0
21	Quality of soil	+ +	+ +	0	-	0
D	**Technical**					
22	Use of technology	0	0	- -	-	+
23	Scale of mining	+ +	+ +	- -	-	+

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CHAPTER10ENVIRONMENTALMANAGEMENTPLAN

10.0 INTRODUCTION

A project specific Environmental Management Plan has been formulated subsequent to an EIA study as per the requisite Terms of Reference to ensure that the appropriate environmental management practices are followed in compliance with the environmental legislation.

It has been evaluated that the study area has not been affected adversely with the proposed activity and likely to get new economical fillip, not only for the study area but also for the region as a whole.

Environmental Management for the mining activity is discussed for environmental impact pertains to the operational phase and after. Even though is reversible in nature all the impacts will be visible only during operational phase. The EMP will therefore be initiated during operational

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10.1 CRITICAL ACTIVITIES FOR EMP IMPLEMENTATION

Training and Environmental Awareness;

Documentation and record keeping;

Reporting Procedures;

Stakeholder/ Project Proponent engagement;

Auditing;

Responding to compliance and reporting.

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Table 10.1: Environmental Management Plan

S. No.	Particular	Management Plan
1	**Land Environment**	Safety zone of about 45m on each side of the rail/ road bridges and 45m radius around the wells located in the river bed have been earmarked. River Bed material excavation will not be carried out in this zone. 20m offset will be left against the banks to protect from side collapse. Soil quality will be monitored from strategic locations and analysis will be done once in every two years. To prevent erosion, moving the road or footpath will be kept away from the river's edge. Care will be taken to ensure that pounding is not formed in the river bed.
2	**Water Environment**	Based on baseline data, corrective measures will be taken. Measurement of water level fluctuations to assess impact of mining activity on the water table depletion in close proximity of dug wells and bore wells. Rainwater harvesting (percolation tank) has been proposed for augmenting ground water resources and for arresting/ reversing the declining trends of ground water levels.

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		Regular monitoring and analysis of water samples strategic locations will be carried out to monitor the water quality of the area.
3	**Air Environment**	**Unpaved Roads** Water sprinkling will be done for dust suppression. Leveling of roads will be done to maintain the uniform speed of the trucks/tippers. Water sprinkling will be done on a fixed stretch of paved road passing through the villages. Adequate transportation routes will be decided transport the mineral and will be maintained properly. Speed breakers will be constructed to restrict the speed of transporting vehicles. However, limiting of vehicular speed will be adopted. **Transportation** The vehicles will be maintained to control the air emissions. The speed of the vehicles will be maintained uniform. PUC certified vehicles will be used. The loaded vehicles will be covered with tarpaulin. Over loading will be avoided.

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4	**Noise Environment**	Regular inspection and maintenance of vehicles and equipment will be performed to ensure efficiency and worn parts will be replaced. Limited numbers of equipments will be used on-site. The vehicles will be maintained in good condition and overloading will be avoided. Speed limits will be enforced in relation to road conditions and on-route communities. Road surfaces will be maintained in good condition to reduce tyre noise and to assure continuous traffic flow to avoid prolonged idling.
		Noise monitoring will be conducted on a regular basis to determine compliance with noise criteria. Personal protective devices i.e., earmuffs and earplugs will be provided to workers, working in high noise areas. Periodical medical checkup will be Organized for all workers to check any noise related health problems.
5	**Occupational Health andSafety**	**Heat & Light** The mine site will have adequate drinking water supply so that workers do not get dehydrated. Lightweight and loose fitting clothes having light colors will be provided

10.2 ENVIRONMENTAL ACTION PROGRAMME

The Project Proponent is quite conscious of its responsibility for maintaining clean and a healthy environment. The management is also keen to modify and make more efficient measures towards

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suppression of pollution sources. Adequate fund for Pollution Control Measures are provided as a part of overall project financing to ensure the availability ofproper treatment facilities. This cost will be spending phase wise along with the growth of project. The breakup of the proposed cost for Environment Management Program is given as under:

Table 10.2: Budgetary allocated for EMP

S. No	Project Activity	Project Stage	Mitigation Measure	Location	Means of Verification	Frequency of monitoring	Responsibility	Reporting Requirement	Budget (INR)/Annum
1	Environmental Pollution Monitoring i.e Water, Air, Soil & Noise etc.	Operation Phase	If any increase in level of Pollutants reported from monitoring , necessary control measure would be taken	Location of Air, Water, Soil & Noise monitoring Location:- 1Project Site 2 Jambri 3 Pandhal 4 Panasa 5 Kans Brahmana 6Garan Khalsa Location of Surface Water monitoring Locations: Chenab River	Site Inspection, Visual Observation and monitoring Records	Half Yearly	Environment Officer	Half Yearly Compliance reporting to MoEF & CC, R.O., MoEF & CC, R.O, R.P.C.B	Air Sample 6Location 6x 2x 3500= 42,000/- Water Sample 6 Location 7x 2x 2500= 30,000/- Noise Sample 6 Location 6x 2x 2000= 24,000/- Soil Sample 6Location 6x 2x 2000= 24,000/- Total Cost of Monitoring Year wise= 1,20,000/-
2	Dust Suppression	Operation Phase	Regular water Sprinkling at dust generating areas,	Near Mine Site/Kachha	Site Inspection,	Daily	Environment Officer	Project Proponent	1,15,000

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	(Water Sprinkling)		Haul Roads. Water Sprinkling will be done in thrice during the day on haul road and connecting road	road	Visual Observation by expert, Assessment of Survival rate				
3	Green Belt	Operation Phase	3 Layers Plantation on both side of the Kachha road will increase the floral diversity of the area. Sufficient availability of water will be ensured for Green belt. The Green belt area once marked will not be disturbed during life of mine. The lease area devoid of any vegetation .	Kachha road in first year	Site Inspection, training records, visual assessment	During the Project Operation Phase	Environment Officer	During the Project Phase / Half Yearly Compliance reporting to MoEF & CC	Rs. 40,000 /-year
4	Road Repairing	Operation Phase	Promote environmental awareness among the employees and Encourage them to work in an environmentally responsible manner. Communicate the environmentalcommitment and performance of The organization to its clients, customers and the public. Purchase products and services, as far as possible, that do the least Damage to the environment on a life cycle basis.	Mine Site and Near By Villages,	Site inspection, training records, visual assessment	Monthly	Environment officer	Half Yearly Compliance reporting to MoEF&CC	50,000 /-year

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Total	**3,25,000**

BUDGETARY PROVISION FOR ILLEAGAL MINING

Mining is proposed in the small area where mining will be done as per condition of environment clearance, sustainable Sand Mining Guideline 2016. Environment & Monitoring Guideline for Sand mining and RMMCR, 2017. To curb the illegal Mining in the remaining area. There are Four point (Roads) from where river can be approached. Therefore Four numbers of night vision camera will be installed and data will be made available to state government. Apart from this the Project Proponent takes the responsibility that no illegal Mining will be allowed/ done for remaining area. The budget required to curb the illegal Mining will be as follows:

S.No	Particular	Capital	Recurring
1	Transport Permit	1,05,000	-
2	CCTV Camera	25,000	2500
3	Weight bridge	5,00,000	50,000
4	Personal Computer with power backup	25,000	2500
5	MobileApplication, Barcode Scanner	10,000	
6	Radio Frequency Identification tags (RFID) and Global Positioning System (GPS) tracking	1,00,000	1000
7	Annual Audit	-	10000
8	Security Guard	-	1,20,000
Total		7,65,000	1,86,000

10.3 CONCLUSION

Various aspects of mining activities are considered and related impacts are evaluated. Considering all the possible ways to mitigate the environmental concerns Environmental Management Plan is prepared and fund is allocated for the same. The EMP is dynamic, flexible and subjected to periodic review. For project where the major environmental impacts are associated, EMP will be under regular review. Senior Management responsible for the project will conduct a review of EMP and its implementation to ensure that the EMP remains effective and appropriate and environmental quality will improve under EMP program. Thus, the proper steps will be taken to accomplish all the goals mentioned in the EMP and the project will bring the positive impact in the study area.

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CHAPTER11 SUMMARY&CONCLUSION

11.0 INTRODUCTION

With increase in industrialization coupled with population growth, the demand for different minerals has increased and is likely to grow further in years to come. This has resulted in irreversible impacts on diminishing reserve, with simultaneous generation of solid wastes and effluents causing environmental degradation. In order to mitigate the impact of river bed material mining on the environment, a scientific assessment is a pre-requisite for framing sustainable development strategies. It is therefore important to tackle the problem for control of pollution and mining of minerals in a cost- effective method causing least damage to the ecosystem. Project has to go through screening under Category"B" project and is being considered in the Ministry as the tenure of SEIAA, Jammu and Kashmir has expired to obtain Environmental Clearances from the JKEIAA.

11.1 SAILENT FEATURES OF PROJECT

The silent features of the river bed mining project in brief are given as follows:

Geological and Mineable reserves (as per approved mine plan)

11.3 MINING METHODOLOGY

As per Jammu & Kashmir Minor Mineral Concession Rules, 1962 and amendments extraction of river bed material in bench mode will be limited to 3.0 m depth, width will be approx. 20 m and bench will advance parallel to the bank of the river. Extraction activities will start in the block from the upstream to downstream side. This will not obstruct the movement of water, if any, during monsoon period in the river course. Roads in the lease area for the movement of loaded tippers/ trucks will not have slopes more than 1 in 20. Roads will be properly maintained and water sprinkling will be used for dust suppression. Lease area will have its own approach road, which already exist and is well connected to main highways. Light weight excavators will be used for loading of mineral in tippers/trucks.

11.4 BASE LINE DATA & IMPCT DUE TO PROPOSED PROJECT

Ambient Air: Base line data were monitored twice in a week in pre-monsoon season as per wind rose pattern of the area. The methodology in selection of monitoring locations is discussed in Chapter 3 of EIA report.

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Noise Level

The values of noise observed in some of the areas are primarily owing to vehicular traffic and other anthropogenic activities.

Water Quality Results

The results of Ground water samples are collected at different locations in the pre-monsoon season as discussed above for organoleptic & physical parameters, general parameters, toxic and biological parameters.

Soil Quality Results

Monitoring was carried in pre-monsoon season at the frequency of once in a season at different locations for physical, chemical and biological properties of the soil at these locations. Sands are dominating in the soil texture at all locations. The presence of Nitrogen content varies from location to location.

11.5 ENVIRONMENT MANAGEMENT PLAN & CSR

Separate fund was allocated for EMP and CSR activities. Funds allocated for plantation work along the road and other places as advised by Gram Panchyat.

Conclusion

Results of baseline environmental parameters and impact of proposed project on them, it was found that impact of proposed project on environment is not significant. Proposed project will improve infrastructure development as river bed material is core constituent in construction of structures, bridges, highways etc. It will provide direct employment to the people in the area and business development opportunities to others. Scientific river bed mining will protect river bed and stops floods.

Proposed project will improve economy of the surrounding area as discussed below:

Project will protect river bed and stops flood in river.

River bed material will be used in infrastructure development in construction of roads/highways, bridges, buildings and complexes.

Sale of river bed material will provide exchequer to State Govt. in form of taxes, duties, royalty etc.

Project will provide employment to the unskilled and semi skilled sections of society and business opportunity for others.

Environment will be improved under Environment Management Program of the project.

In total project has positive and significant impact in development of socio-economic environment.

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