M : 93570-62220
M : 94640-58506

M/s. LAKHWINDER SINGH

(STONE CRUSHER & SCREENING PLANT)
Site - Village - Polian Beet (Near Jaijon Border)
Tehsil Haroli, Distt. Una (H.P.)

Date:20.03.2023

To,

The Member Secretary, SEAC
Department of Environment, Science & Technology,
Paryavaran Bhawan, Near US Club, Shimla (H.P) – 171002

Sub: - Regarding submission of Draft EIA Report namely "Mining of Sand Stone and Bajri from Mauza/Mohal Kuthar beet Tehsil Haroli, District Una H.P. by Sh. Lakhwinder Singh, Lease Area-7.2135 Hectares".

Sir,

I am submitting herewith the Draft EIA Report in the prescribed format of Ministry of Environment & Forests along with relevant documents for Public Hearing.

Thanking you,
Yours truly,

(Authorized Signatory)
Sh. Lakhwinder Singh S/o Sh. Jagmail Singh
(As Above)

DRAFT EIA REPORT

FOR

MINING OF SAND STONE AND BAJRI AT MAUZA/MOHAL KUTHAR BEET, TEHSIL HAROLI, DISTRICT UNA, HIMACHAL PRADESH

Project Area:7.2135 Ha.

Production Capacity: 3,54,258 TPA

Located at

MAUZA/MOHAL KUTHAR BEET, TEHSIL HAROLI, DISTRICT UNA, HIMACHAL PRADESH

By

SH. LAKHWINDER SINGH

Category- 'B1'

TOR File No.: File No.HPSEIAA/2022/1000 dated 15.10.2022

Baseline Monitoring Period: Oct.,2022 to Dec.,2022

Monitoring done by: Noida Testing Laboratories

(NABL Certificate No.: TC-6814)

PREPARED BY

SHIVALIK SOLID WASTE MANAGEMENT LIMITED
(QCI/ NABET Certificate No: NABET/EIA/2023/SA 169 dated July 28, 2022
Address: SCO 20-21, 1st floor, Near Hotel Dolphin, Baltana, Zirakpur, (Punjab)- 140604

March,2023

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M : 94640-58506

M/s. LAKHWINDER SINGH
(STONE CRUSHER & SCREENING PLANT)
Site - Village - Polian Beet (Near Jaijon Border)
Tehsil Haroli, Distt. Una (H.P.)

Date: - 20.03.2023

UNDERTAKING

I Sh. Lakhwinder singh S/o Sh. Jagmail Singh, Project Proponent of the proposed Hill slope Mining project located at Khasra No. 1165, 1166, 1169, 1173, 1174,1196,1197,1198,1200, 1206,1206/1,1226,1227 Mauza/ Mohal Kuthar beet in Tehsil Haroli, District Una, Himachal Pradesh, hereby declare that we have engaged Shivalik Solid Waste Management Ltd, accredited by QCI/NABET Certificate No. NABET/EIA/2023/SA 0169 dated August 16, 2023, as EIA Consultant for preparation of EIA/EMP Report. We hereby certify that the data/information presented in the report is factually correct and that we own the contents (information and data) of the EIA /EMP Report.

Thanking you,
Yours truly,

(Authorized Signatory)
Sh. Lakhwinder Singh S/o Sh. Jagmail Singh
(As Above)

1 INTRODUCTION

1.1 PURPOSE OF THE REPORT

The purpose of EIA study is to assess the beneficial and adverse impacts of the proposed Sand, Stone & Bajri mining project on the existing environmental parameters, so that suitable control measures could be taken to reduce impacts. Thus, the EIA report is a summarized presentation of base line information of air, water, soil, noise, flora, fauna, socio-economic study, and the prevailing environmental scenario of the project activity and the likely impacts due to proposed project, to decide the suitable mitigation measures for implementation to maintain pollution content within permissible limits.

The major objectives of the report are:-

- To establish the present environmental scenario,
- To anticipate the impact of proposed project and
- To suggest preventive and mitigation measures

The Ministry of Environment, Forest and Climate Change (MoEF&CC) through its EIA notification number SO1533 (E) of 14th September 2006 and its subsequent amendments under the Environment Protection Act, 1986, classifies the projects under two categories, i.e., Cat. A (≥100 ha.) and Cat. B1 (<100 ha and>25 ha).

The proposed project Extraction of Sand Stone and Bajri Proposed by Sh. Lakhwinder singh S/o Sh. Jagmail Singh is having lease area of 07-21-35 hectare from khasra No. 1165, 1166, 1169, 1173, 1174,1196,1197,1198,1200,1206,1206/1,1226,1227 Mauza/Mohal Kuthar beet Tehsil Haroli District Una H.P. falls under Category "B1" as per EIA Notification 2006 as amended thereof issued by the Ministry of Environment and Forests, New Delhi. require Environmental Clearance from State Level Environmental Impact Assessment Authority (SEIAA), constituted by MoEF & CC, New Delhi.

The proposed project is having lease area of 07-21-35 hectare falls under Category- "B1"because the mining lease area more than 5 hectare.

The project of extraction of sand, stone & bajri from khasra No. 1165, 1166, 1169, 1173, 1174,1196,1197,1198,1200,1206,1206/1,1226,1227 having lease area 07-21-35 Hectare was submitted to SEAC for grant of Terms of references vide proposal No. HP SEIAA vide letter No. HPSEIAA/2022/1000 Dated 15.10.2022. The HPSEAC granted auto TOR letter for this Project. The TOR Letter attached as **Annexure I.**

1.2 IDENTIFICATION OF PROJECT & PROJECT PROPONENT

The project for Extraction of Stone, Bajri and sand from khasra No. 1165, 1166, 1169, 1173, 1174,1196,1197,1198,1200,1206,1206/1,1226,1227 Proposed by Sh. Lakhwinder Singh S/o Sh. Jagmail Singh located at Mauza/Mohal Kuthar beet Tehsil Haroli District Una H.P. The Letter of Intent has been sanctioned in favor of Sh. Lakhwinder Singh S/o Sh. Jagmail Singh vide letter no. Udyog – Bhu (Khani -4) Laghu-855/2020/4198 27.08.2021, same attached as **Annexure II &** joint Inspection Report & Tatima & Jamabandi attached as **Annexure IV & V**).

The Mining Plan has been approved plan vide letter no. Udyog – Bhu (Khani -4) Laghu-855/2020/9271 dated 03.01.2022 is attached as **(Annexure-VI).**

1.3 BRIEF DESCRIPTION OF NATURE, SIZE, LOCATION OF THE PROJECT AND ITS IMPORTANCE TO THE COUNTRY

The detail of the project is compiled in the table 1.1 below:-

TABLE 1-1: SALIENT FEATURE OF THE PROJECT

Project name	Mining of Stone, Bajri and sand from khasra No. 1165, 1166,1169,1173,1174,1196,1197,1198,1200,1206,1206/1,1226,1227 Proposed by Sh. Lakhwinder Singh S/o Sh. Jagmail Singh located at Mauza/Mohal Kuthar beet Tehsil Haroli District Una H.P.
Mining lease area	07-21-35 Hect.
Location of mine	KhasraNo.1165,1166,1169,1173,1174,1196,1197,1198,1200,1206,1206/1,1226,1227 Proposed by Sh. Lakhwinder Singh S/o Sh. Jagmail Singh located at Mauza/Mohal Kuthar beet Tehsil Haroli District Una H.P.
Latitude	31° 23' 53.47" N to 31° 23' 29.23" N
Longitude	76° 10' 22.51" E to 76° 10' 32.01"E
Toposheet number	53A3, 53A7
River/Nallah/Tanks/Lakes et.	Soan River
Minerals of Mine	Sand, Stone & Bajri
Proposed production of mine	3,54,258 MTPA
Method of mining	Semi-Machanized
No of working days	270 days
Cost of the Project	20 Lakhs
Water demand	1.35 (Domestic) + 6.0 (Dust Suppression) = 7.35 KLD
Sources of water	Water will be supplied from Bore well for drinking purpose & dust suppression which is located khatta No.162min khatuni no. 253min Khasra No. 2180 in mohalla VPO Kungrat Tehsil Haroli District Una H.P.
Man power	30 workers
Waste Generation	39362 TPA of mine waste will be generated as a waste during mining process
Nearest railway station	Jaijon Doaba Railway Station: about. 6.3 km in the SW direction (Aerial Distance).

Nearest state highway/national highway	NH 503A (Hoshiyarpur-Una Road) About 9.8 km in NNE direction.
Nearest airport	Ludhiana Airport: approx. 63.5 km in SSW Direction (Aerial Distance).
Seismic zone	Seismic zone IV

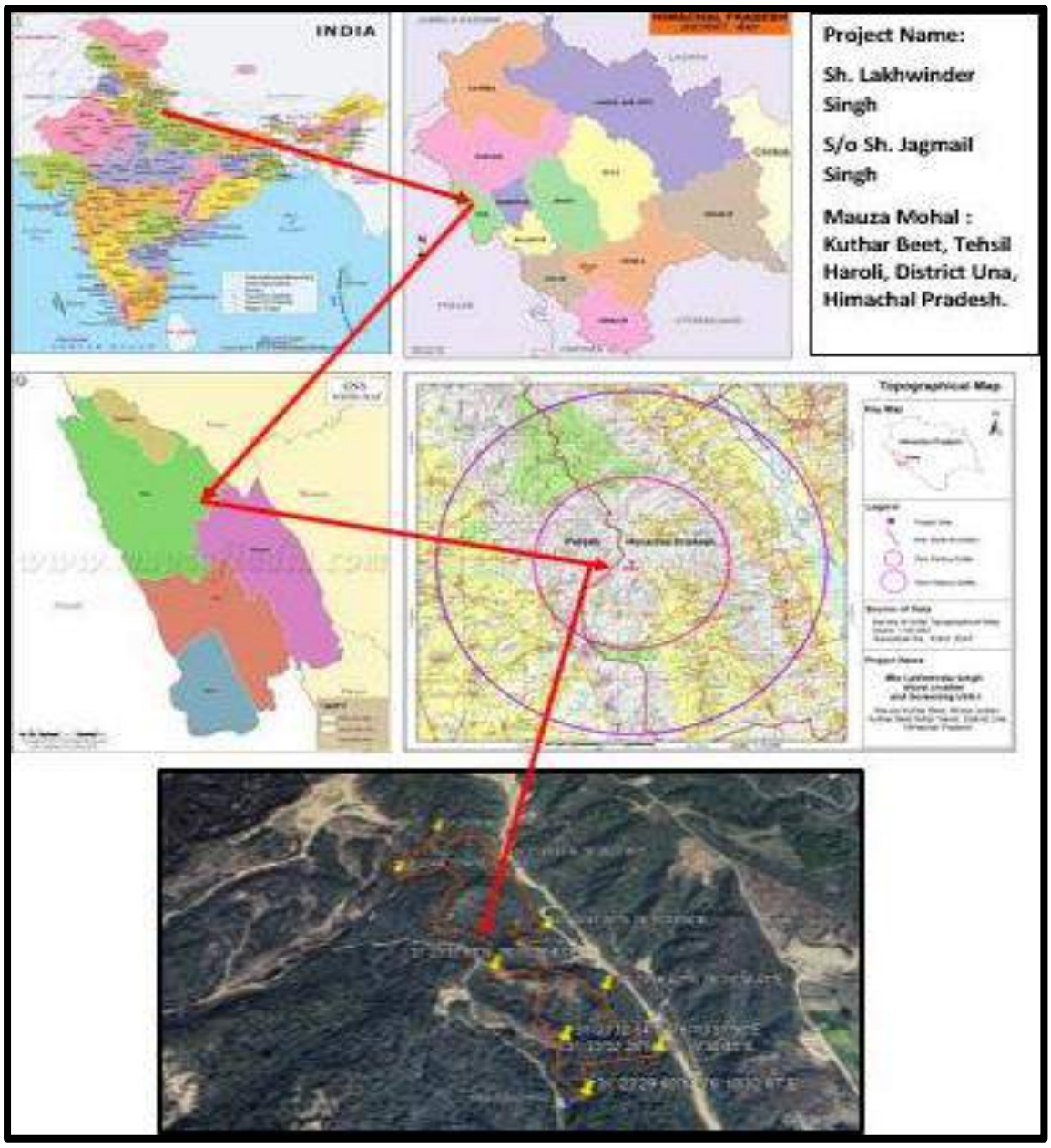


FIGURE 1-1: LOCATION OF THE PROJECT

1.4 IMPORTANCE OF THE PROJECT:

Excavated stone, *bajri* and sand are one of the largest non-fuel mineral commodities by tonnage produced in Himachal Pradesh, supplying some of the most important construction materials. Further, average unit value of stone, sand and *bajri* is one of the lowest of all mineral commodities. This production of aggregate in a particular area is a function of the availability of natural resources,

the size of population, the economy of the area and various developmental and infrastructural works being undertaken in the area like road construction, hydro-electric projects etc.

Benefits of Sustainable Hill Slope Mining

- It generates useful economic resource for construction.
- It generates employment in local area.

1.5 SCOPE OF WORK FOR EIA/EMP

The Environmental Impact Assessment report has been prepared based on the terms of Reference for EIA study issued by HP SEIAA vide letter No. HPSEIAA/2022/1000 Dated 15.10.2022. The three months base line monitoring has been done form Post monsoon period Oct.2022 to Dec.-2022.

The EIA study has been conducted as per the applicable rules/guidelines of Ministry of Environment and Forests, Govt. of India including general/sectoral provisions and in accordance to prescribed ToR by SEAC. The EIA study includes, but not necessarily restricted to the following:

(a) Literature Review
(b) Field Studies
(c) Impact assessment and preparation of the EIA/EMP

An outline of the activities carried out in stages A, B, C are briefly described below.

Stage A: Environmental Baseline Monitoring (EBM)

Assessment of relevant features of the project those are likely to have an impact on environment during construction and operation phases.

Stage B: Impact prediction

Assessment of likely emissions from the proposed facility and assessment of impacts using scientific tools to delineate post project scenario.

Stage C: Environmental monitoring and management plan

Suggesting adequate pollution control measures to offset adverse impacts if any,
Preparation of EIA and EMP documents and defending the study findings before the regulatory authorities.

The EIA study has been conducted by collection of primary baseline data of ambient air quality, surface and ground water quality, soil quality, noise levels, metrology flora and fauna, socioeconomic status within study area of 10 km radius from the project site i.e core area.

The secondary data has also been collected from respective government and private institutions The impacts are predicted on the basis of baseline environment data highlighting the positive & negative impact on account of proposed mining activities.

Environmental Management Plan is prepared for mining project, suggesting various mitigation measures to reduce/eliminate adverse impacts of the riverbed mining to meet the prescribed standards.

1.6 STRUCTURE OF EIA REPORT:

In terms of EIA Notification of the MoEF, New Delhi dated 14th September 2006 and its subsequent amendments later, the generic structure of the EIA document is as under:-

The generic structure of the report is given below:

Chapter 1: Introduction: This chapter describes the purpose of the report, identification of nature, size and location of the mining lease area (with latitude and longitude) and its proponent, description of site and surrounding environment, location maps, importance of project to the country and region and finally the Scope of the EIA study, as per TOR approved by MOEF.

Chapter 2: Project Description: (Based on the Feasibility Report) This chapter describes the type and need of the mining of sand ,stone and bajri, magnitude of operation, geology of the area , reserve and quality of ore available, schedule for approval and implementation, land requirement, Water requirement and flow scheme, technology and process description, site plan, layout of project location, boundary and site.

Chapter 3: Description of the existing Environment: This chapter describes the study area, period of study, components and methodology, establishment of baseline data for valued environmental components and base maps of all environmental components like meteorology, ambient air quality, ambient noise quality, hydrology and water quality, land use, Soil quality, Ecology, demography, occupational pattern, and socioeconomics.

Chapter 4: Anticipated Environmental Impacts and Mitigation Measures: This chapter describes the details of investigated impacts due to mining activities , Impact of mining on hydrology, changes of natural drainage, possible accidents, ,regular operation, measures for minimizing and/or offsetting adverse impacts identified, irreversible and irretrievable commitments of environmental components, assessment of significance of impacts [criteria for determining significance, assigning significance] and mitigation measures.

Chapter 5: Analysis of Alternatives (Technology & Site): This chapter describes the details of the scoping exercise results in need for alternatives.

Chapter 6: **Environmental Monitoring Program**; This chapter include the technical aspects of monitoring the effectiveness of mitigation measures including measurement methodologies, frequency, location, data analysis, reporting schedules, emergency procedures.

Chapter 7: Risk Assessment & Additional Studies: This chapter describes risk assessment and DMP, occupational health and safety, social impact assessment.

Chapter 8: Project Benefits: This chapter describes the benefits coming from the project in terms of improvements in the social infrastructure, employment potential –skilled; semi-skilled and unskilled and other tangible benefits.

Chapter 9: Environmental Cost Benefit Analysis: This chapter describes the environmental benefits of the project.

Chapter 10: Environmental Management Plan: This chapter describes the administrative aspects of ensuring that mitigation measures are implemented, and their effectiveness monitored after Environment Clearance of the project.

Chapter 11: Summary and Conclusion: This constitutes the summary of the EIA Report.

Chapter 12: Disclosure of Consultant Engaged: The names of the consultants engaged with their brief resume and nature of consultancy rendered.

1.7 STATUS OF LITIGATIONS

There are no litigation/court cases pending against the project as on date.

1.8 COMPLIANCE OF TOR

The Point wise compliance of ToR is as under: -

TABLE 1-2 COMPLIANCE FOR TERMS OF REFERENCE

S.No.	Terms of Reference	Cross Ref. in EIA Report
1	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.	NA, New Project
2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.	Letter of Intent attached as **ANNEXURE- II**
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 documents *i.e.*, Draft EIA report and approved mine plan are Submitted at the time of Draft Submission. Draft EIA report is prepared for conducting of the Public Hearing
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).	Complied; **Chapter -2 & 3**

5	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of landforms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	Geomorphology map (1:50,000 scale) is given in **Chapter-2** Land Use details indicting land use pattern of the area incorporated in **Chapter-3.**
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.	Yes, the land is allotted for mining as per State policy.
7	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders At large, may also be detailed in the EIA Report.	Yes, the company has well laid down Environment Policy & shall comply with all its requirement
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 is the case of mining of sand stone & bajri from hill slope. All the safety measures are given in **Chapter–7**
9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.	The 10 Km zone from periphery of the lease has been considered as the study area. The life of mining lease mentioned in **Chapter-2.**
10	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife	Land use map of the 10 km study area delineating forest area, agricultural land,

	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.	grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features given in **Chapter–3**
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.	Not applicable,
12	A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	DFO letter attached as **ANNEXURE-VII**
13	Status of forestry clearance for the broken-up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	Not applicable, no forest land is involved.
14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Not applicable.
15	The vegetation in the RF/PF areas in the study area, with necessary details, should be given.	Complied Details of the Biological Environment of the study area is incorporated in **Chapter-3**

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.	Given in **Chapter-3**
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.	Not Applicable No National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Tiger/ Elephant Reserves (existing as well as proposed) within 10 km of the mine lease DFO certifying the same is attached as **ANNEXURE-VII.**
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.	Complied Details of the Biological Environment of the study area is incorporated in **Chapter-3**

19	Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravalli 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 furnished to the effect that the proposed mining activities could be considered.	Not applicable.
20	Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not applicable.
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, familywise, 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.	Not Applicable, the proposed project is hill slope does not involve any displacement hence R&R plan is not required.
22	One season (non-monsoon) [i.e., March-May (Summer Season); October-December (post monsoon season); December-February (winter season)primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-	Baseline monitoring data details are given in **Chapter-3** Site-specific meteorological data has been collected and shown in the report.

	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.	Free silica as a mineralogical concentration of PM_{10} is given in the **Chapter-3.**
23	Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used, and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.	Air quality modeling will be incorporated in **Chapter-4** Wind rose given in **Chapter-3**
24	The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.	Water is required for dust suppression & drinking purpose is 7.35 KLD (Domestic)+1.35 KLD (Dust Suppression) = 6.0 KLD. Details are Incorporated in **Chapter- 2**
25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Water will be supplied from Bore well for drinking purpose & dust suppression which is located khatta No.162min khatuni no. 253min Khasra No. 2180 in mohalla VPO Kungrat Tehsil Haroli District Una H.P.
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	Not applicable, there is no requirement of water in the process of mining.

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.	There will be no impact of the project on the ground water quality as the mining will be carried out up to a depth of 1-meter bgl or above ground water table whichever comes first. The mining of sand stone & bajri will be carried out during non-monsoon period; thus, quality of surface water is not likely to be affected. Necessary measures for controlling water pollution are incorporated in **Chapter-4**
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.	The mining shall be carried out up to the depth of 1meter in Non-Monsoon season & shall not intersect the ground water.
29	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.	NA, as it is hill slope mining.
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.	Details of the site elevation are incorporated in **Chapter-2** & **Chapter-4** along with the contour plans. Schematic representation of the site elevation working depth & ground water is given in approved mine plan Attached as **ANNEXURE-VI.**

31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	As this is a Hill slope mining there is no vegetation within the mining lease, no vegetation is possible within the mine lease area. List of species to be planted is given in **Chapter -4.**
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.	Traffic study is incorporated in **Chapter-4**
33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	A temporary rest shelter will be provided for the workers near to the site with provisions of water, first aid facility, protective equipment's, etc. Detailed in **Chapter-2**
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.	Proposed project is mining of sand ,stone & bajri from the hill slope during non-monsoon period. Once mining will be done the lease area replenished with local fast-growing species.

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.	Occupational health impact mainly is expected from air pollution due to fugitive dust emission because of movement of vehicles. However, appropriate mitigation measures for air pollution control have been proposed and detailed in the **Chapter-9** Financial provision has been incorporated in **Chapter-6** i.e., EMP in terms of capital cost & recurring cost.
36	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	Public health implications of the Project detailed in **Chapter 7.** Financial provision has been incorporated in **Chapter-6** i.e., EMP in terms of capital cost & recurring cost.
37	Measures of socio-economic significance and influence on 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	Details of the social economic scenario of the study area is indicated in of **Chapter-3**
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.	Given in **Chapter–6**
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.	Draft EIA report is being submitted for Public Hearing. Budgetary provisions will be incorporated in the EMP report.
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.	There is no litigation pending against the project.

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.	Cost of the project is Rs 20 lakhs. The costs towards the implementation of EMP Capital Cost 37.97, Recurring cost per Year 10.35 lakhs. Recurring for Five Years 51.75 lakhs.
42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	Disaster management Plan given in **Chapter-7**
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.	Benefits of the Project given in **Chapter-8**

In addition to above standard TOR conditions laid down by the MoEF&CC following TORS are requires by SEAC:-

S. No.	Terms of Reference	Cross Ref. in EIA Report
1	All documents to be properly referenced with index and continuous page numbering.	Agreed.
2	Where data are presented in the Report especially in Tables, the period in which the data were collected, and the sources should be indicated.	Agreed.
3	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.	Agreed and Noted.
4	Where the documents provided are in a language other than English, an English translation should be provided.	Agreed.
5	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	Agreed.
6	While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.	Agreed.

7	Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.	Agreed and Noted.
8	As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.	Agreed.
9	The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.	Agreed.

Manually Revised TOR Points :

1	The PP shall include the details analysis of GLC 2.5 with air modeling and shall prepare the wind rose diagram of the site to plan the installation of PDS's. The air water etc samplings and analysis to be recorded and to be submitted to SEIAA with records.	Air quality Modelling included in **Chapter 4.**
2	The PP shall Submit affidavit to ensure that after ceasing mining operations undertake regressing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.	Agreed.
3	The PP shall make provision of depositing capital cost @ 4.00 lacs per ha. under CER in the form of DD/Transfer of funds in mentioned A/C No. to the office of Director (DEST &CC), GoHP.	Agreed.
4	The District magistrate shall furnish public hearing proceeding with Clear cut recommendation falling which the SEIAA shall refer back the PH Proceeding to DC Concerned for the same.	Agreed.

2 PROJECT DESCRIPTION

2.1 DESCRIPTION OF THE PROJECT

The proposed project is the mining of Sand, Stone and Bajri from 7.2135 ha. of lease area located on Khasra No.1165, 1166, 1169, 1173, 1174,1196,1197,1198,1200,1206,1206/1,1226,1227 at Mauza/Mohal Mauza/Mohal Kuthar beet in Tehsil Haroli, District Una, Himachal Pradesh . The lease has been sanctioned in favor of Sh. Lakhwinder Singh S/o Sh. Jagmail Singh vide letter no. Udyog Bhu (Khani -4) Laghu-855/2020 dated 27.08.2021. Copy of LOI is attached as **ANNEXURE-II**.

The chapter deals with the location, local geology, The lease area forms a part of hill slope and is covered with B members of the upper Shiwalik Formation. The hill side is comprised of thick boulder bed of the B member of the Upper Shiwalik formation comprising of boulders, cabbles, pebbles river borne bajri, clay and Sand/Silt deposits of terrace alluvium. The study of the rocks in and around the applied mining lease area belongs to Shiwalik group comprising of Boulders, Pebbles, Cabbles, clay, sand and Silt.

2.2 TYPE OF PROJECT

This is a new project. No forest land is involved. The project is a semi-mechanized mining project, where mining of Stone, Sand & Bajri will be done from the hill slope at Khasra No.1165, 1166, 1169, 1173, 1174,1196,1197,1198,1200,1206,1206/1,1226,1227 at Mauza/Mohal Mauza/Mohal Kuthar beet in Tehsil Haroli, District Una, Himachal Pradesh. No Rotational mining will be done. Method of mining is opencast, semi-machanized without drilling & blasting, restricted up to 1m

s stone crusher linked with mine site, excavated minerals will be sent in crusher site.

2.3 LOCATION

The mining lease area is located at Mauza/Mohal Mauza/Mohal Kuthar beet in Tehsil Haroli, District Una, Himachal Pradesh. The mining lease area is 7.2135 ha. in Topography sheet No. 53A3, 53A7. Buffer map showing features in 10 km radius in **Figure no. 2.1**. Pillar co-ordinates showing the mining lease area is given in **Figure 2.2.**

As per revenue details shown in table below the mine lease area is auctioned land.

TABLE 2-1: DETAILS OF MINING LEASE AREA

Sr. No	Khasra Number	Area in Hectare	Owner of Land	Kism	Mauza/Mohal
1	1165, 1166, 1169, 1173, 1174,1196,1197,1198,1200,1206,1206/1,1226,1227	7.2135	Private Land	Banjar Kadeem	Kuthar beet

Source: Approved Mine Plan

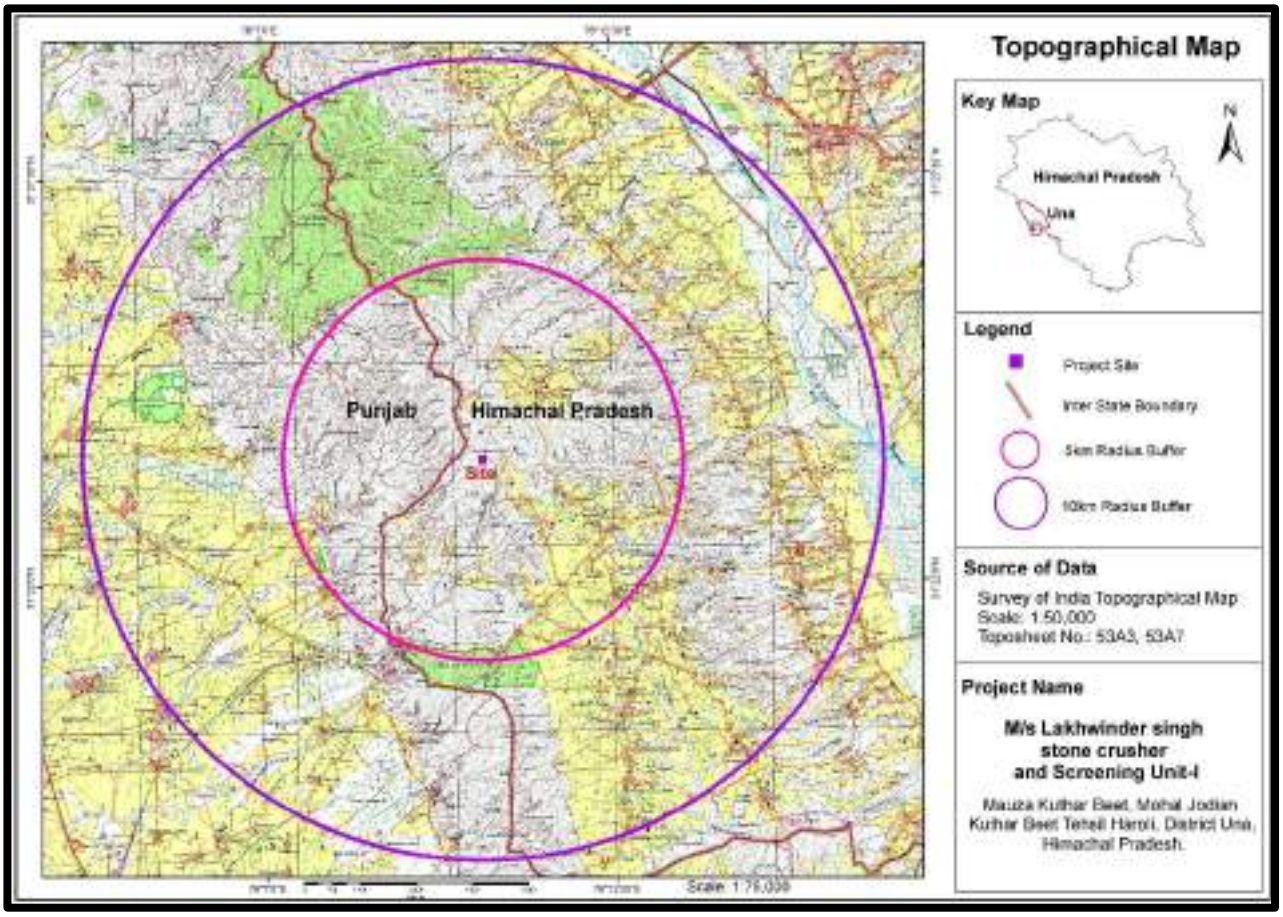


FIGURE 2-1: MAP SHOWING 5 KM & 10 KM BUFFER FROM THE PROJECT SITE

FIGURE 2-2: PILLAR CO-ORDINATE SHOWING PROJECT LOCATION

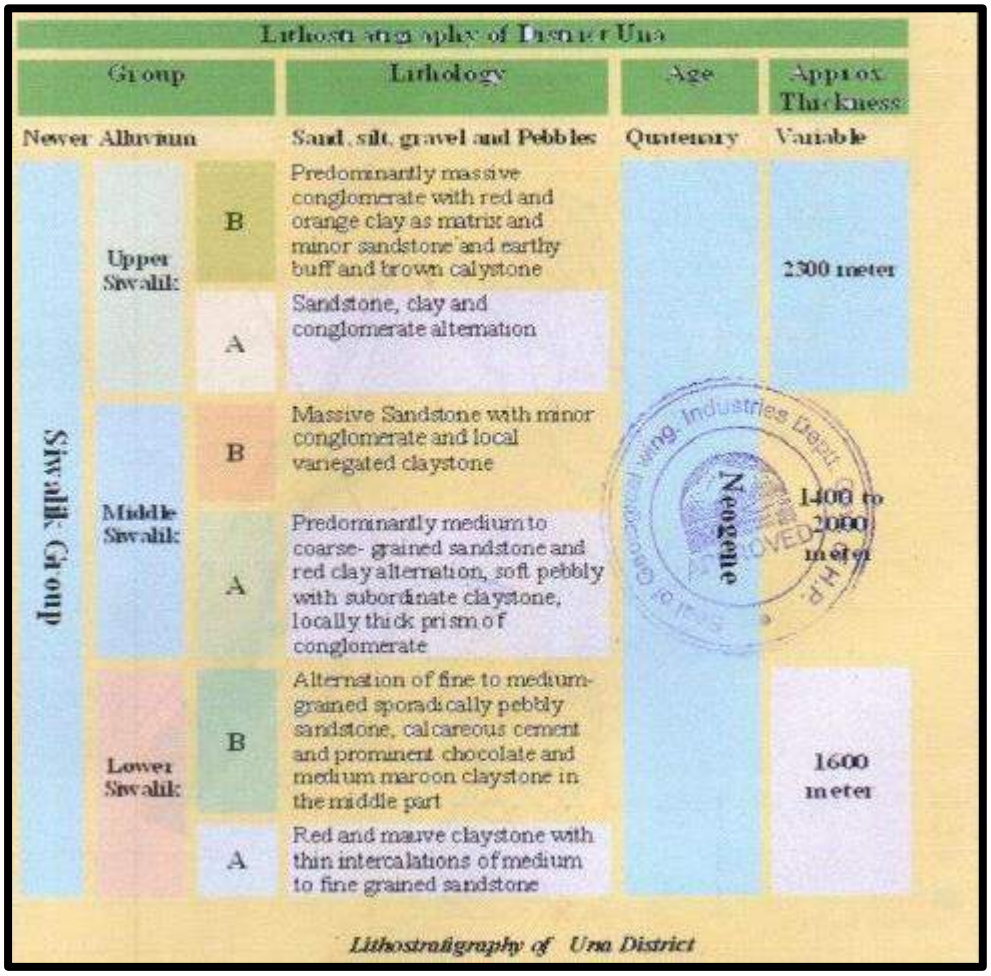
2.4 GEOLOGY

Una District lies in the South-Western part of Himachal Pradesh. It is Bounded by Kangra District in the north and North-east Hamirpur District in the east, Bilaspur in the south-east and Punjab state in the west and South. The district is stretched between 31° 17' 52 - 31° 52' 0 north latitudes and 75°

58' 21 - 76° 28' 25 east longitudes. The district has a total area if 1,550sq.kms and ranks 10th in the state in order of area.

Source: https://hpgeneralstudies.com/brief-geography-of-district-una-himachal-pradesh/

TABLE 2-2: STRATIGRAPHY OF THE AREA



2.5 GEOLOGY OF THE AREA

Una is one of the districts of Himachal Pradesh, India, and shares its border with the Hoshiarpur District and Ropar district of Punjab. The terrain is generally a plain with low hills. Una has been identified as a main industrial hub and has become a transit town for travelers going to the famous city of Dharamshala or locations within the Himalayas such as Kullu, Manali, Jawalamukhi, and Chintpurni. Una has 5 Tehsils Ghanari, Haroli, Amb, Bangana and Una. Una is home to the Kila, which is a historical fort and an ancestral home of the descendants of the first guru of the Sikhs, Guru Nanak. Una although unchanged for past century has shown huge appetite for growth and development. The City and Urban area are expected to grow at rapid pace amidst the investment coming from native N.R.I community which is huge in number as every household has at least one family member or relative working abroad. The district lies in the south-western of Himachal Pradesh. It is bounded by Kangra district in the north and north-east, Hamirpur district in the east, Bilaspur in the south-east and Punjab in the west and south. The district is stretched between 31 0 17' 52" -31 0 52' 0" north longitudes and 75 0 58' 0" -76 0 28' 25" east longitudes. Una district covers an area of 1,550 sq. km. Himalayan foothill zone bounded by plains of Punjab in the west and Solasinghi Dhar in the east. In the western part also there is hill range whose maximum height is

about 600 meters. The ranges trend in a general NW-SE direction and the area between these forms longitudinal valley of the Swan river. The altitudes of the area vary from 350 meters to 1,200 meters on the Salasinghi Dhar.

Shiwalik range experience heavy rainfall. The Swan River is itself a tributary of Satluj river and the confluence is just south of Santokhgarh. The hill ranges covered by scanty vegetation comprising mostly shrubs. The breadth of Jaswan Dun valley ranges from 7 kilometers to 14 kilometers and the town of Una which is not in the middle of the Dun is on the elevation of 427 above the sea level.

While Una is bounded by the river Beas on the north and river Satluj in the east, the Swan River which is basically a seasonal river flows right across the Jaswan valley towards south and submerges in the Satluj near Anandpur. The Swan River indeed is the life belt of Jaswan-Dun Valley which on its course receives innumerable tributaries both from left and right thereby abounds quick sands and is risky to cross when in speed.

Geological map of the district Una is given in below figure 2.3.

Source- http://cgwb.gov.in/District_Profile/HP/Una.pdf

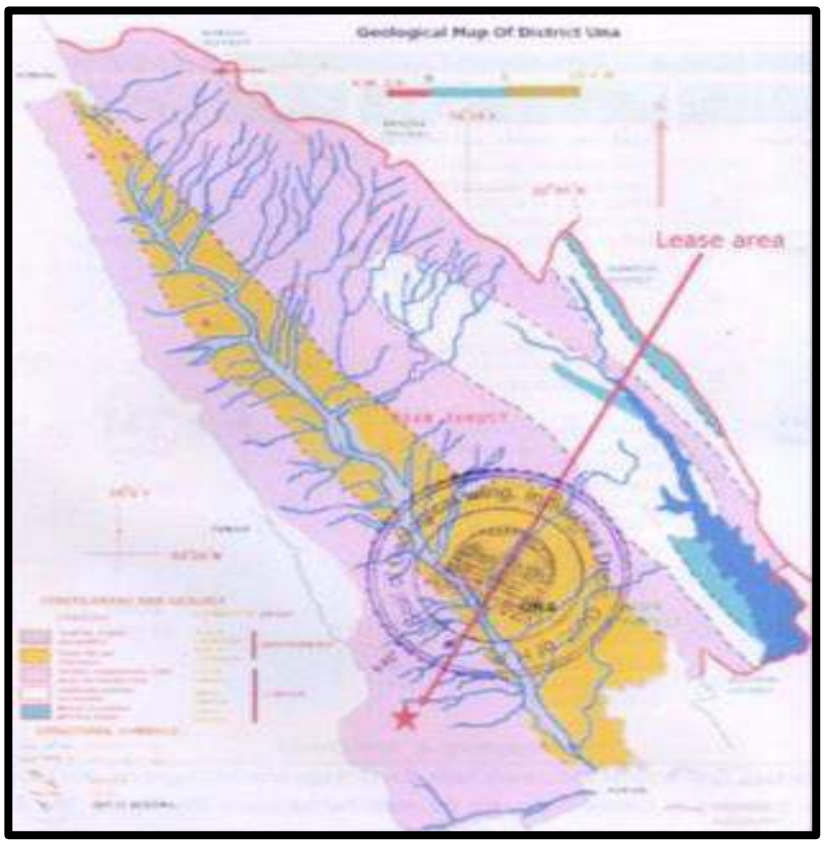


FIGURE 2-3: GELOGICAL MAP OF UNA DISTRICT

2.5.1 Local Geology

The Shiwalik group mainly represent the rock of the district. In addition to this at few places the newer alluvium of quaternary age is also present.

The Shiwalik deposits are one of the most comprehensively studied fluvial sequences in the world. They comprise mudstone, claystone and coarsely bedded conglomerates laid down when the region was a bast basin during middle Miocene, to upper Pleistocene times. The sediments were deposited by rivers flowing southwards from the greater Himalayas, resulting in extensive multi-ordered

drainage system. Following the deposition, the sediments were uplifted through intense tectonic regimes(commencing in upper Miocene times), subsequently resulting in a unique topographical entity- The Shiwalik hills. The siwalik are divided stratigraphically into three major Sub groups- Lower, Middle and Upper. These sub groups are futher divided into individual formations that are all laterally and vertically exposed today in varying linear and random patterns.

2.6 AREA, RESERVES OF DEPOSIT

The area applied for mining lease is situated near village Kuthar beet, tehsil Haroli, Una Himachal Pradesh. The Mining lease area measuring 7.2135 hectares. The proposed project is for mining of 3,54,258 TPA of sand, stone and bajri.

2.6.1 Exploration

In order to calculate the percentage of various sediments found in the mining lease, a trial pit was dug at a most representative site, having dimensions of 1 m. * 1 m. * 1 m. (Length * width * depth). The content of the total material dug out from the pits were separated into five categories i.e stone, bajri (cobbles), sand. The percentage of each category was found to be stone 40 %, bajri 30 %, sand 20 % and silt 10%. The percentage of these constituents is likely varied from year to year. One meter from the surface is considered for calculation of the reserve.

2.6.2 Mineable Reserve

An average specific gravity of 2.25 is taken for the calculation of reserves. The of mineable reserves were estimated by multiplying the surface area with specific gravity and depth of 3 metre up to which the mining is allowed as per mining policy. Thus, a total of 3,54,258 TPA of material is available in the mineable area of 60760 square meters. Total lease area is 72135 Sqm, no mining Zone is 11375.00 Sqm, Area available after leaving no mining zone is 60760 Sqm.

- ❖ Every year approx 3,54,258 MT of material will be excavated to a depth of one metre.
- ❖ The reserves are replenishable with plantation and local fast-growing species.

2.7 TECHNOLOGY AND PROCESS DESCRIPTION

The size or amount of production of material from the lease area will depend upon following factors: -

- The size or amount of minerals production is depending upon the anticipated demand of the materials in the market.
- The extracted minerals will be used for construction industries.
- The top bench proposed at 554M meters level.
- The bottom bench is proposed at 508 meters level.
- Total 21 benches are proposed.
- The bench height & width would of 4m x 4m meters.
- The major mining activity will be undertaken during the dry seasons only.
- No mining will be undertaken during monsoon period.
- The average specific gravity of the minor mineral has been taken as 2.25 for calculation of reserves and one meter depth is taken for calculation reserve.
- Mined mineral i.e Sand ,stone and Bajri will be loaded in tractor ,trolley/trucks and transported through evacuation route shown in **Fig 2.6** for stone crusher unit for manufacturing Grit.

The proposed mining lease area 7-21-35 Hectare. It has been proposed to collect Maximum 3,54,258 TPA of Stone maximum quantity of max. 39362 TPA Mine Waste shall be generated.

2.8 PRODUCTION PROCESS

The mining lease has been proposed by Sh. Lakhwinder Singh S/o Sh. Jagmail Singh. The mining lease area is 7.3521 Hectare located at Mauza/Mohal Kutharbeet in Tehsil Haroli, District Una, Himachal Pradesh. It has been proposed to collect approximately 3,54,258 TPA of Sand, Stone & Bajri. 39,362 TPA of mine waste will be generated as a waste during the mining process. Waste shall be used for road filling works & back filling for Plantation.

Mining lease area is a hill slope and suitable material for extraction of stone is available in whole of lease area. Keeping in view the suitability of material, scientific mining & safe distance from boundary line, the mining is proposed in between 558m (highest elevation level) & 508 m (Lowest elevation level) bench level as shown in the mining plan. Mining will be done Within the lease area by open cast method of mining by bench formation of 4x4 meters from top to bottom shall be followed. This method is adopted on the bases of the concept of changing hill slope within the proposed limits of mining up to the ultimate pit limit and restoring the area by making benches and terracing the hill slope.

Conceptual Scheme of Mining.

- The mining is proposed in between 554m & 508m level
- In totals 21no of benches are suggested at following levels:

Number of Benches	**Block A** 554Ameters level 550A meters level 546Ameters level 542A meters level 538A meters level 534A meters level 530Ameters level 526A meters level 522A-1Ameters level 522-IIA meters level 518A meters level 514A meters level 510A meters level **Block B** 536B meters level 532B meters level 528B meters level 524B meters level 520B meters level 516B meters level 512B meters level 508B meters level

- The main commercially exploitable material is Stone.
- 270 working days have been taken for the purpose of calculation.
- Check dam/Retaining walls shall be erected at vulnerable points, towards valley side of active working bench, so that no material rolls down on the slope.
- Mining shall be done manually & Semi mechanized. No blasting is required.
- The stone from the mining lease area will be used for captive stone crusher.
- The material shall be loaded into trucks & transported to the interlinked crusher.

- The Buffer zone of 5.0 meters has been kept around the boundary of the proposed mine site for safety point of view.
- The Mining will be undertaken by forming Four by Four-meter benches.

TABLE 2-3 YEAR WISE PRODUCTION PROGRAMME IN METRIC TONES

Year	1st	2nd	3rd	4th	5th	Total
Stone	**354009**	**353962**	**354033**	**353995**	**354258**	**17,70,252**

(Source: Approved Mine Plan)***

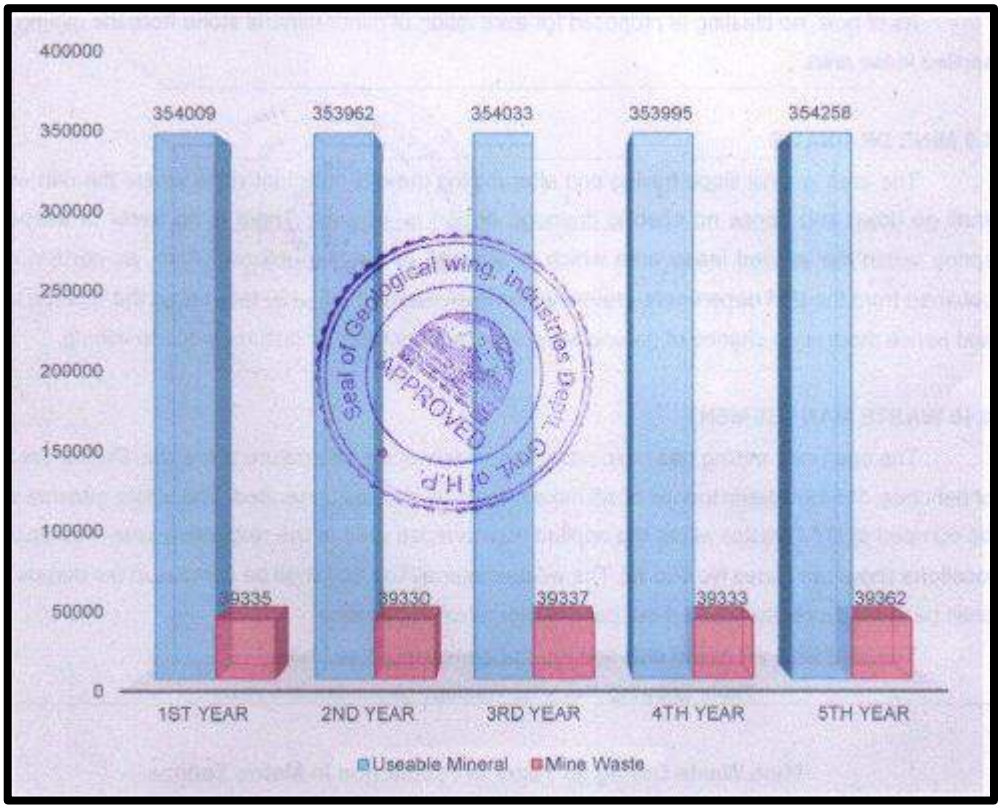


FIGURE 2-4: GRAPH SHOWING THE YEAR WISE EXCAVATED OF THE MATERIAL

Table 2-4: YEAR WISE PRODUCTION

Year	Production of Material (in MT)		Total
	Sand, Stone and Bajri	Mine Waste	
1st Year	**354009**	39335	**3,93,344**
2nd Year	**353962**	39330	**3,93,292**
3rd Year	**354033**	39337	**3,93,370**

4th Year	**353995**	39333	**3,93,328**
5th Year	**354258**	39362	**3,93,615**
Total	**17,70,252**	**1,96,697**	**19,66,949**

(*Source: Approved Mine Plan)

2.8.1 Mining Methodology

During the lease period, the mining will be done from the top to bottom.

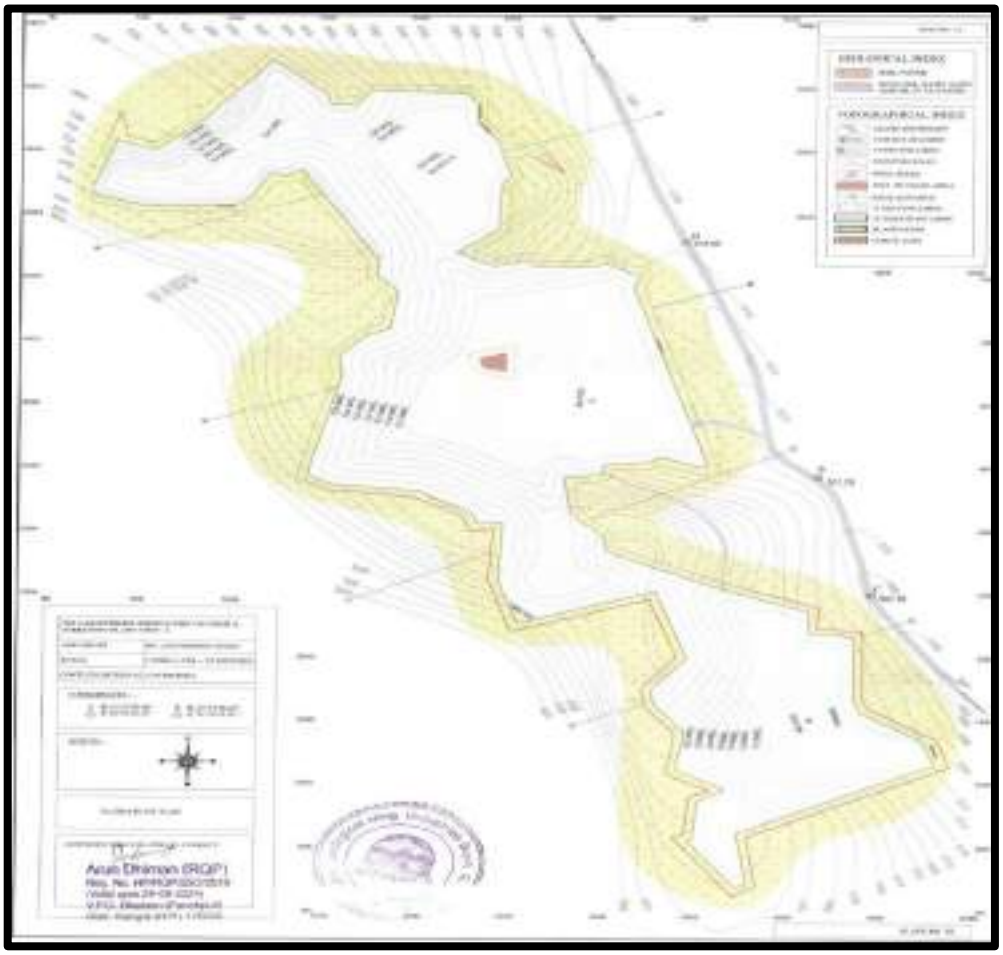


FIGURE 2-5: FIVE YEAR OF WORKING PLAN MINE LEASE AREA

2.8.2 Proposed Year Wise Production Detail:

1st Year :Annual production proposed to meet the requirement of stone crusher unit would be around 354009 TPA Stone, Boulders, Bajri and Sand for the 1st year. For this, benches in block at 554A, 550A, 546A, 542A & 538A m.R.L shall be opened with total useable reserve of 521498 metric tons.

Table 2-5: 1st YEAR PRODUCTION

Production Of Each Mineral in First Year (In MT)						
Bench	Duration	RI of Bench	Opening reserves of Useable Stone, boulder, bajri & Sand	Minor mineral extracted/ Used	Closing reserves of bench	Wastage (Silty Sand + Clay)
No.	In Year	In meters	In MT	In MT	In MT	In MT
1, 2, 3, 4 & 5	First Year	554 A	46656	46656	0	5184
		550 A	88938	88938	0	9882
		546 A	93656	93656	0	10406
		542 A	97403	97403	0	10823
		538 A	194846	27356	167489	3040
		TOTAL	**521498**	**354009**	**167489**	**39335**

2nd Year : During this year 353962 metric tonnes of Stone, Boulder, Bajri and Sand Production is proposed to meet the requirement of the stone crusher unit. To fulfill this requirement , remaining material from the bench at 538A m.R.L. shall be used and new benches in block A at 534A m.R.L and 530A m.R.L. shall be opened with total usable reserve of 477922 M.T. The benches at 538A m.R.L and 534A m.R.L shall be fully exhausted and the bench at 530A m.R.L with total reserve of 50255 metric tonnes of material shall be partly worked and only 26295 M.T shall be extracted. The remaining material of this bench shall be used in the next working yarer.

Table 2-6: 2nd YEAR PRODUCTION

Production Of Each Mineral in Second Year (In MT)						
Bench	Duration	RI of Bench	Opening reserves of Useable Stone, boulder, bajri & Sand	Minor mineral extracted/ Used	Closing reserves of bench	Wastage (Silty Sand + Clay)
No.	In Year	In meters	In MT	In MT	In MT	In MT
5, 6 & 7	Second Year	538 A	167489	167489	0	18610
		534 A	160178	160178	0	17798
		530 A	150255	26295	123960	2922
		TOTAL	**477922**	**353962**	**123960**	**39330**

3rd Year : During this year, the remailing material from 530-meter R.L bench shall be extracted and new become in Block A at 526A m R.L. and 522 A m.R.L shall be opened to meet out the requirement of 354033 metric tonnes of Stone, Boulders, Bajri and Sand. The beaches at 530 m.R.L.& 526A m.R.L. shall be fully exhausted and the bench at 522 A with total reserve of 96360 metric tonnes of material shall be partly worked and only 88322M.T of material shall be extracted. The remaining material of this bench shall be used in the next working yarer.

Table 2-7: 3rd YEAR WISE PRODUCTION

Production Of Each Mineral in Third Year (In MT)						
Bench	Duration	RI of Bench	Opening reserves of Useable Stone, boulder, bajri & Sand	Minor mineral extracted/ Used	Closing reserves of bench	Wastage (Silty Sand + Clay)
No.	In Year	In meters	In MT	In MT	In MT	In MT
7, 8 & 9	Third year	530 A	123960	123960	0	13773
		526 A	141750	141750	0	15750
		522 I A	96390	88322	8068	9814
		TOTAL	**362100**	**354033**	**8068**	**39337**

4th Year: During this year 353995 metric tonnes of stone, Boulders, Bajri and Sand production is proposed to meet the requirement of the stone crusher unit. In order to meet the above requirement of minor mineral, it shall be extracted from left out bench of 522 m R.L. and new beaches in block A at 522A m.R.L (522 IA), 522 II A m.R.L., 518 A m.R.L. & 514A mRL shall be completely exploited and the bench at 510m R.L shall be partially exhausted and the remaining material from bench would be exploited during the next working year.

Table 2-8: 4th YEAR WISE PRODUCTION

Production Of Each Mineral in Fourth Year (In MT)						
Bench	Duration	RI of Bench	Opening reserves of Useable Stone, boulder, bajri & Sand	Minor mineral extracted/ Used	Closing reserves of bench	Wastage (Silty Sand + Clay)
No.	In Year	In meters	In MT	In MT	In MT	In MT
9, 10, 11, 12 & 13	Fourth Year	522 I A	8068	8068	0	896
		522 II A	29160	29160	0	3240
		518 A	102060	102060	0	11340
		514 A	121379	121379	0	13487
		510 A	113400	93328	20072	10370
		TOTAL	**374067**	**353995**	**20072**	**39333**

5th Year: During this year 353995 metric tonnes of stone, Boulders, Bajri and Sand production is proposed to meet the requirement of the stone crusher unit. In order to meet the above requirement of minor mineral, it shall be extracted from left out bench of 510 m R.L. and new beaches in block A at 536B m.R.L 532B,528B,524B,520B,516B,512B and 508B m.R.L. shall be opened. All the material generated from these shall be used and shall be exhausted during this year.

Table 2-9: 5th YEAR WISE PRODUCTION

Production Of Each Mineral in Fifth Year (In MT)						
Bench	Duration	RI of Bench	Opening reserves of Useable Stone, boulder, bajri & Sand	Minor mineral extracted/ Used	Closing reserves of bench	Wastage (Silty Sand + Clay)
No.	In Year	In meters	In MT	In MT	In MT	In MT
13, 14, 15, 16, 17, 18, 19, 20 & 21	Fifth Year	510 A	20072	20072	0	2230
		536 B	28350	28350	0	3150
		532 B	34992	34992	0	3888
		528 B	37908	37908	0	4212
		524 B	41958	41958	0	4662
		520 B	50949	50949	0	5661
		516 B	55445	55445	0	6161
		512 B	45704	45704	0	5078
		508 B	38880	38880	0	4320
		TOTAL	**354258**	**354258**	**0**	**39362**

(*Source: Approved Mine Plan)

2.9 WASTE GENERATION DURING MINE PERIOD

The top soil from the working benches will be removed by means of an excavator and stacked

separately and used for backfilling from first year onwards. The Interburden is low grade magnesite and shall be removed manual means and to be dumped separately and used for backfilling from first year onwards. The top soil and Interburden material will be dumped separately on mineralized land, but these dumps are temporary in nature and it will be used in reclamation purpose. The yearly waste generation of soil and inter burden is given below: -

TABLE 2-10 WASTE GENERATION DURING FIVE YEARS IN TONES

Year	Mine waste
1st Year	39335
2nd Year	39330
3rd Year	39337
4th Year	39333
5th Year	39362
Total	**1,96,697**

2.10 MODE OF WORKING

The mining shall be done mechanically by using excavators/proclaims/Back hoe Loaders as well as manually by developing 4-meter face height. No blasting shall be carried out without the permission from the competent authorities.

2.11 PLANTATION

The afforestation programme is the most important programme to improve the environment and ecological balance of the area. Grasses and bushes which have fibrous roots are at the first instance grown which give the billing property to the soil. The fast-growing plantation and re grassing shall be done on the exhausted benches as well as backfilling pits will be done in consultation of local peoples or Govt. Authorities like forest department etc. The applied mining lease shall be fenced properly in the entire periphery of the safety zone as per the details. The total mined out area of the beaches shall be 198000 sq.m. and this area shall be dedicated for plantation and re-grassing. The estimated survival rate proposed to be achieved shall be 80%.

2.12 EMPLOYMENT GENERATION/ MANPOWER REQUIREMENT:

- The mining activity in the lease area will thus give a direct employment to about 30 persons engaged in extraction of sand, stone & bajri and: loading of material into tractor trolleys and tipper trucks.
- The stone and bajri shall be transported to crusher site. Thus, for transportation of material about four derivers along with helpers shall be engaged.
- Project will also generate indirect employment for skilled and semi-skilled workers. Thus, the project helps in increasing the socio-economic status or livelihood of the nearby villagers.

TABLE 2-11: EMPLOYMENT DETAILED

S. No.	Category	Numbers
1	Administrative	1
2	Supervisor	1
3	Driver	4

4	Mining workers	24
TOTAL		**30**

2.13 TRANSPORTATION OF THE MINERALS

- The lease area is having gentle slope with the gradient of less than one degree hence, track for the movement of trucks and tractors trolly can be made and maintained in any part of the lease area.
- The loaded tractor trolleys/trucks would carry the material to the crusher site.
- About 1312 metric tons of sand, stone and bajri would be required to be moved daily. Though route map shown in **fig 2. 6**

During mine operation traffic intensity

During mine operation traffic Density

Total capacity of mine	: 81000 TPA including waste
No. of working days	: 270 Days
Per day capacity of mine	: 1312 tonnes/day
Truck capacity	: 9 tonnes
No. of trip deployed	: 145 trips/day
Working hours per days	: 9 hours

***No. of tipper trucks/tractor trolley deployed/h: = 5-8 tractor trolley approx.**

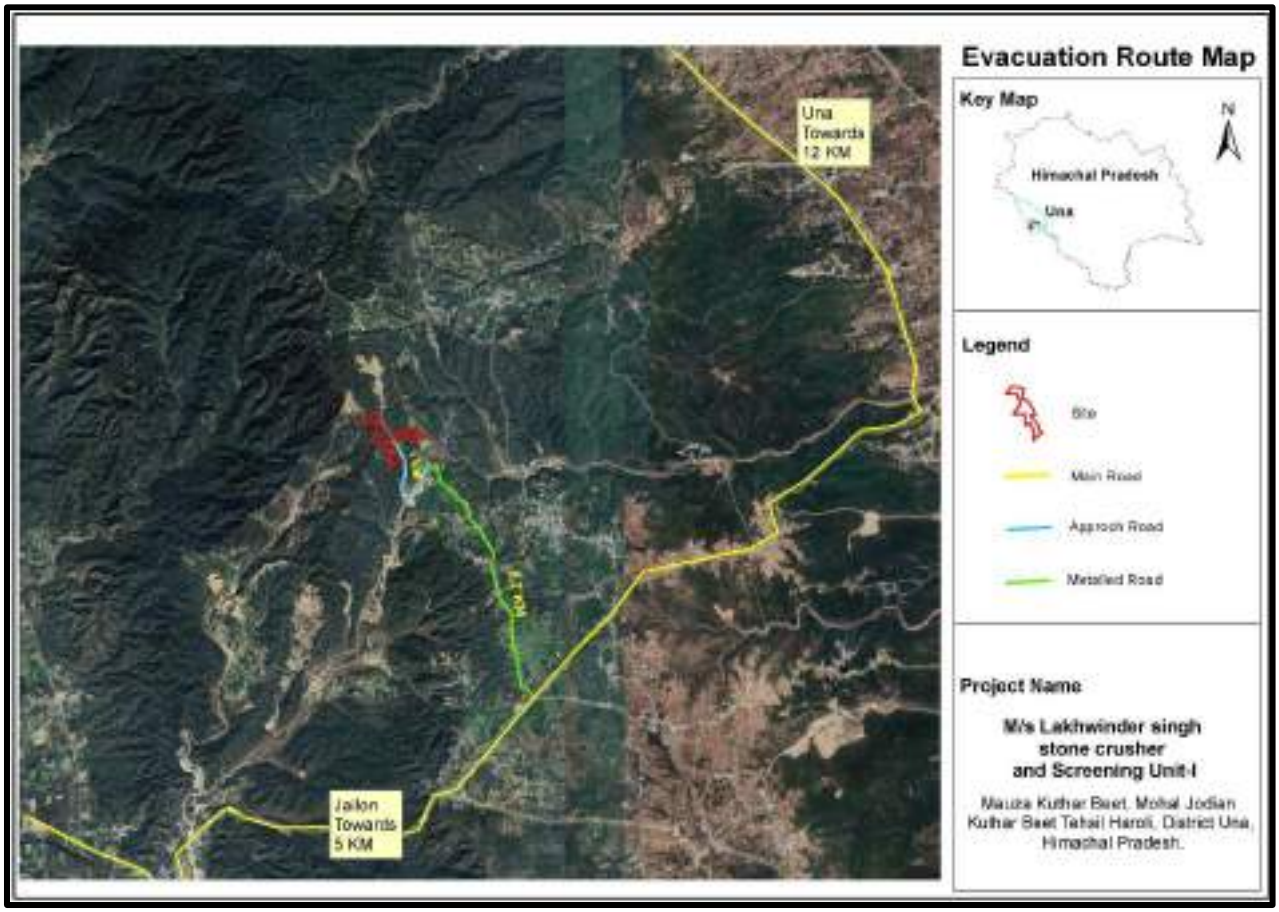
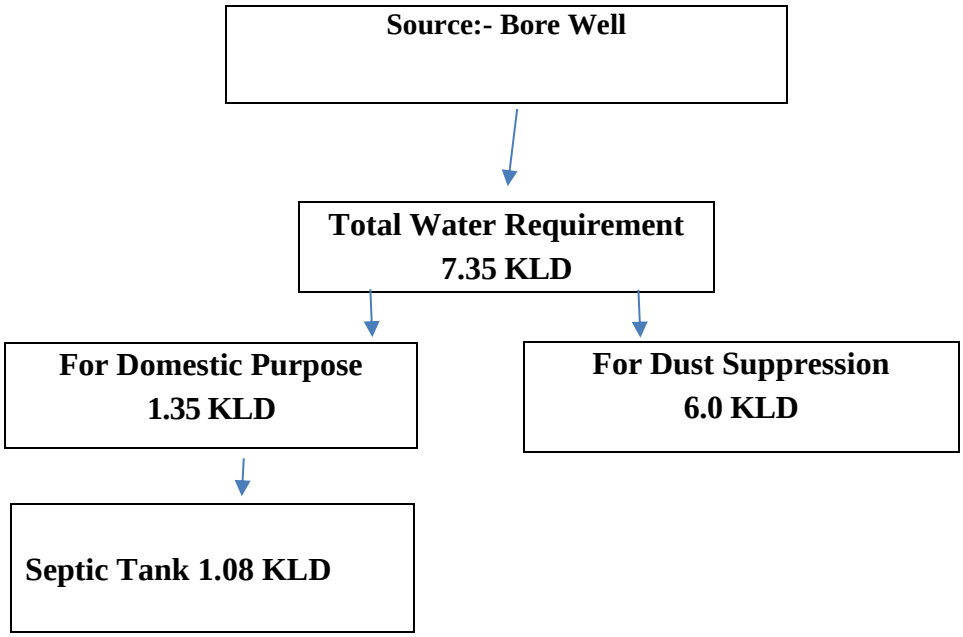


FIGURE 2 6: EVACUATION ROUTE MAP

2.14 POWER, WATER SUPPLY AND OTHER ONSITE REQUIREMENTS

- No raw material will be required in the proposed project. The operation involves the extraction of Sand, Stone and Bajri in its existing form and loaded into tractor trolleys to the stone crusher unit for manufacturing grit. The practice is quite sound in the area and ensure continuous lifting of the material.
- **Power requirement**
  All the activities will be carried out manually. The operation will be done only daytime (9am to 6pm) hence there will be no power requirement at the project site.
- **Water requirement & supply**
  Total amount of water required for the project is **7.35 KLD** Water will be supplied from Bore well for drinking purpose & dust suppression which is located khatta No.162min khatuni no. 253min Khasra No. 2180 in mohalla VPO Kungrat Tehsil Haroli District Una H.P. Water balance diagram is shown below:-



Water is required for drinking, domestic purposes and for dust suppression. The number of working people is 30, so the total water requirement will be around 7.35 KLD. About 6.0 KLD will be required for dust suppression and 1.35 KLD for domestic purpose.

Temporary rest shelter

A temporary rest shelter will be provided for the workers near to the site for rest. In addition, first aid box along with anti-venoms to counteract poison produced by certain species of small insects, if any and Sanitation facility i.e., septic tank or community toilet facility will be provided for the workers outside lease area in nearby settlement area.

2.15 IMPACT OF MINING ACTIVITY & ITS CONTROL MEASURES

The impact on environment due to this mining operation is generally: - The detailed mitigation measures are suggested in **Chapter -4** of EIA report.

TABLE 2-12 DESCRIPTION OF ACTIVATES AND ANTICIPATED IMPACTS

Activities/issues of concern	Anticipated environmental impacts
Mining of mineral & transportation *> Machinery and equipment deployment* *> Haulage of mined out material to the cruncher site* *> On-site storage and handling of material* *> Laying of utilities – roads, & water*	*> Pollution due to operation of equipment* *> Pollution due to fill up of extracted materials* *> Top-soil management* *> Haulage of material and on-site vehicular movement* *> Waste generation due to on-site activity* *> Safety and health issues of workers*
Human settlements *> Temporary/permanent movement of population during operation phase* *> Transportation requirements Requirements of public/civic amenities* *> Waste generation due to mining Mine waste silt & clay*	*> Alteration in settlement patterns* *> Alteration in traffic movement Socio-economic activities due to the proposed project* *> Silt & clay increase the turbidity& total suspended solid.*
Health and safety	*> Health, safety, and welfare of workers during mining activity* *> Safety provision for existing and Activities* *> Probability and containment of natural hazards* *> Emergency/disaster response Management*

3. DESCRIPTION OF ENVIRONMENT

3.1 INTRODUCTION

The main objectives of environmental baseline study are:

(i) To assess present environmental quality for prediction of environmental impacts.

(ii) To identify environmentally significant factors for taking mitigating measures.

The chapter contains information on existing environmental status of land, air, water, biological &socio-economic environment. The mining activity will remain confined to very small area and of little magnitude hence the zone of influence will be only surrounding fields of the leased-out area. To achieve these objectives, monitoring of the environmental parameters within the core zone and buffer zone has been undertaken in accordance with the terms of reference and guidelines for EIA issued by the Ministry of Environment & Forests, climate change Govt. of India.
Accordingly, baseline data (Oct. 2022 to Dec 2022) has been incorporated in the Draft EIA report of this project.

3.2 STUDY AREA AGLANCE:

mine lease periphery. Further the

while the area outside the mine boundary is buffer zone.

Map showing study area of the proposed project is given in Figure-:
Location of project is mentioned here under: -

- Mauza/Mohal Kuthar Beet
- Tehsil- Haroli
- District- Una (Himachal Pradesh)

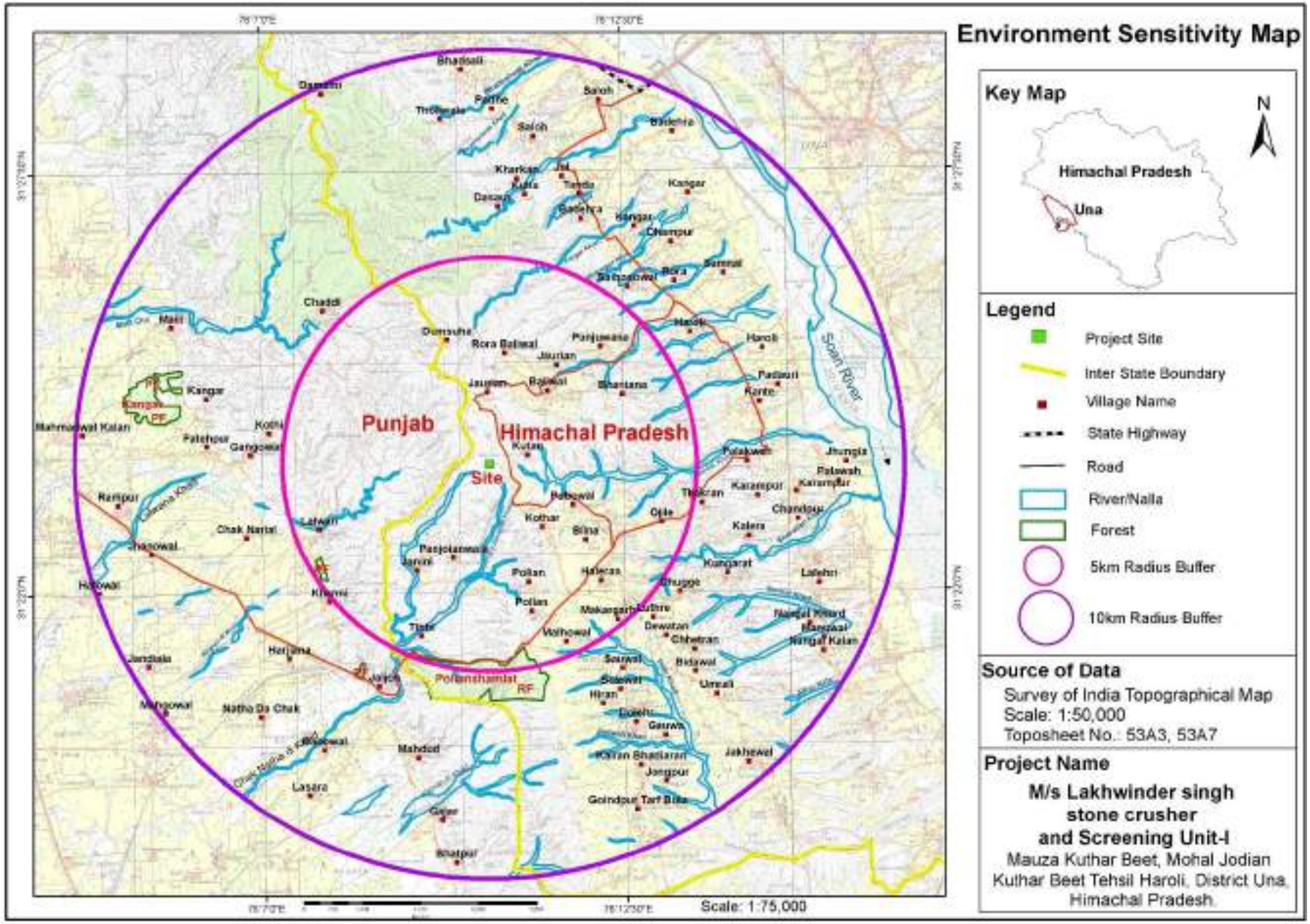


FIGURE 3-1: 5 & 10 KM ENVIRONMENTAL SENSITIVITY MAP SHOWING PROJECT SITE

3.3 ESTABLISHMENT OF BASE LINE FOR VALUED ENVIRONMENTAL COMPONENT AS IDENTIFIED IN THE SCOPE

3.4 PHYSIOGRAPHY, TOPOGRAPHY AND HYDROLOGY

Physiography

Una is a district of Himachal Pradesh which lies in its south western part. On the 1st September, 1972 the himachal pradesh govt. recognized the then Kangra district inti three district namely una, hamirpur and Kangra una district is well developed in the individual sector due to close proximity to Punjab, Mehatpur, Garget, Tahliwal & Amb are main industrial centers of una.

Una district nestles between Siwalik ranges and forms part of the lesser Himalayas. It has a diverse landscape made of hills, valleys with piedmont zone, terraces. The elevations of the land surface in the district, vary from 340 m in south-eastern part to 1041 m above mean sea level (amsl) in eastern part of the district. There are three hill ranges i.e., Chamukha Dhar with maximum elevation of 1041m amsl, which borders with district Hamirpur, Dhionsar Dhar with maximum elevation of 950m amsl and Ramgarh Dhar with maximum elevation of 997m amsl. In the South-West along the border with Punjab, Siwalik hill ranges from hilly upland or plateau area with elevation up to 666 m amsl. The vast area between the northwesterly & southeasterly hill ranges, on both sides of river Soan is known as Una valley. The undulating to plain fertile Una valley has an area of about 455 sq km and it extends from Daulatpur in the North - West to Santokhgarh in the South - East. Soan or Swan River, a tributary of river Satluj, drains the major part (80%) of the Una district. Soan is an intermittent river and maintains base flow in the lower reaches. Soan river has about 80% catchment area in Una district and divides the district into two parts. Soan river flows in a southeastern direction and has a wide channel and exhibits braided nature. It originates near Daulatpur in the North Eastern part and leaves the district near Santokhgarh and subsequently joins river Satluj. Number of local streams (about 73 khads) joins the river within the district. During monsoon Soan river gets flooded due to shallow bank heights and large area on both sides get affected. Govt. of HP has initiated riverbank protection cum flood control measures and the work is in progress. In Bangana area, another stream (Khad), flowing parallel to Soan river is Lunkhar khad, which debouches in Govind Sagar lake. Also, in the extreme north-western part of the district small area forms the catchments of a tributary of Beas river basin. Two types of soils are observed in the district viz., alluvial soil and non-calcic brown soil. Most of the area in the district is covered with alluvial soil and only about 25% of the area i.e., hilly area in the district is covered with non-calcic brown soil. Soil is rich in nutrients and thus are fertile.

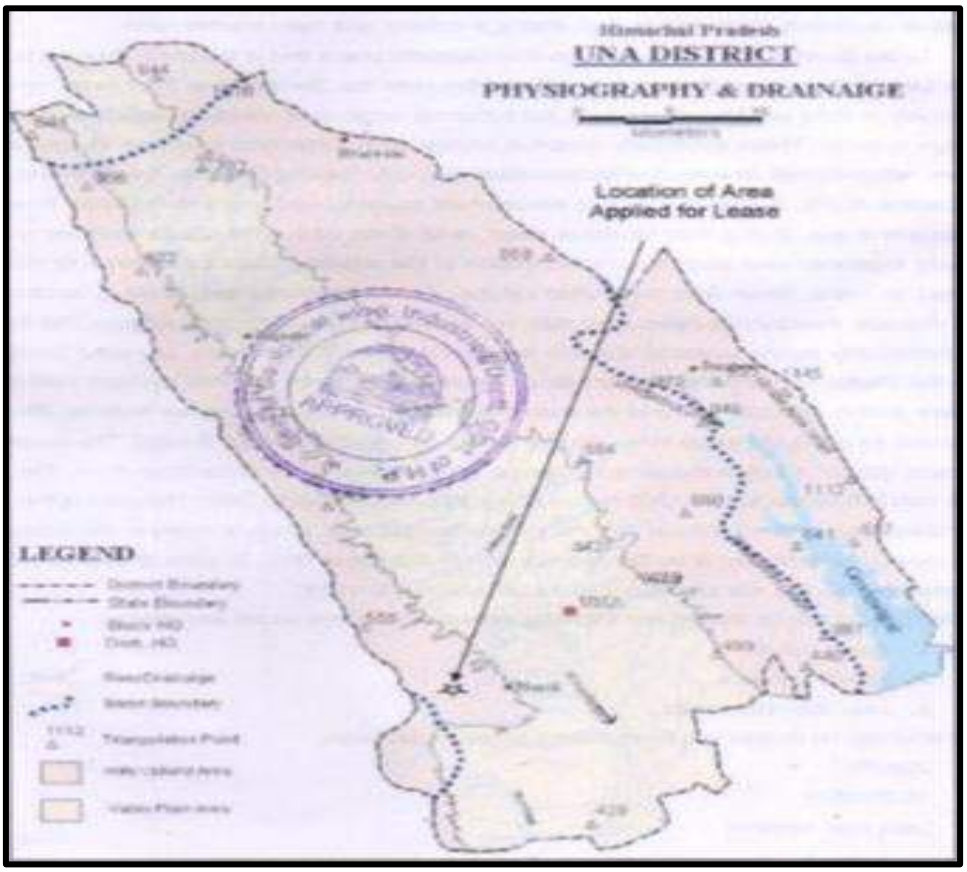


FIGURE 3-2: SHOWING THE SURFACE VIEW OF DISTT. UNA

Source: Mine plan

Topography

According to the 2011 census Una district has a population of 521,057. This gives it a ranking of 543rd in India (out of a total of 640). The Una district has a population density of 338 inhabitants per square kilometre. Its population growth rate over the decade 2001-2011 was 16.24%.Una has a sex ratio of 977 females for every 1000 males, and a literacy rate of 87.23%.Punjabi Rajputs and Gurjars are living in large and heavy margin.

Source: https://www.indianetzone.com/67/una_district.htm

Drainage

The general drainage pattern of the Rivers/ streams in the district is dendritic pattern. All rivers/streams flowing in Una district are tributaries of Soan River catchment.

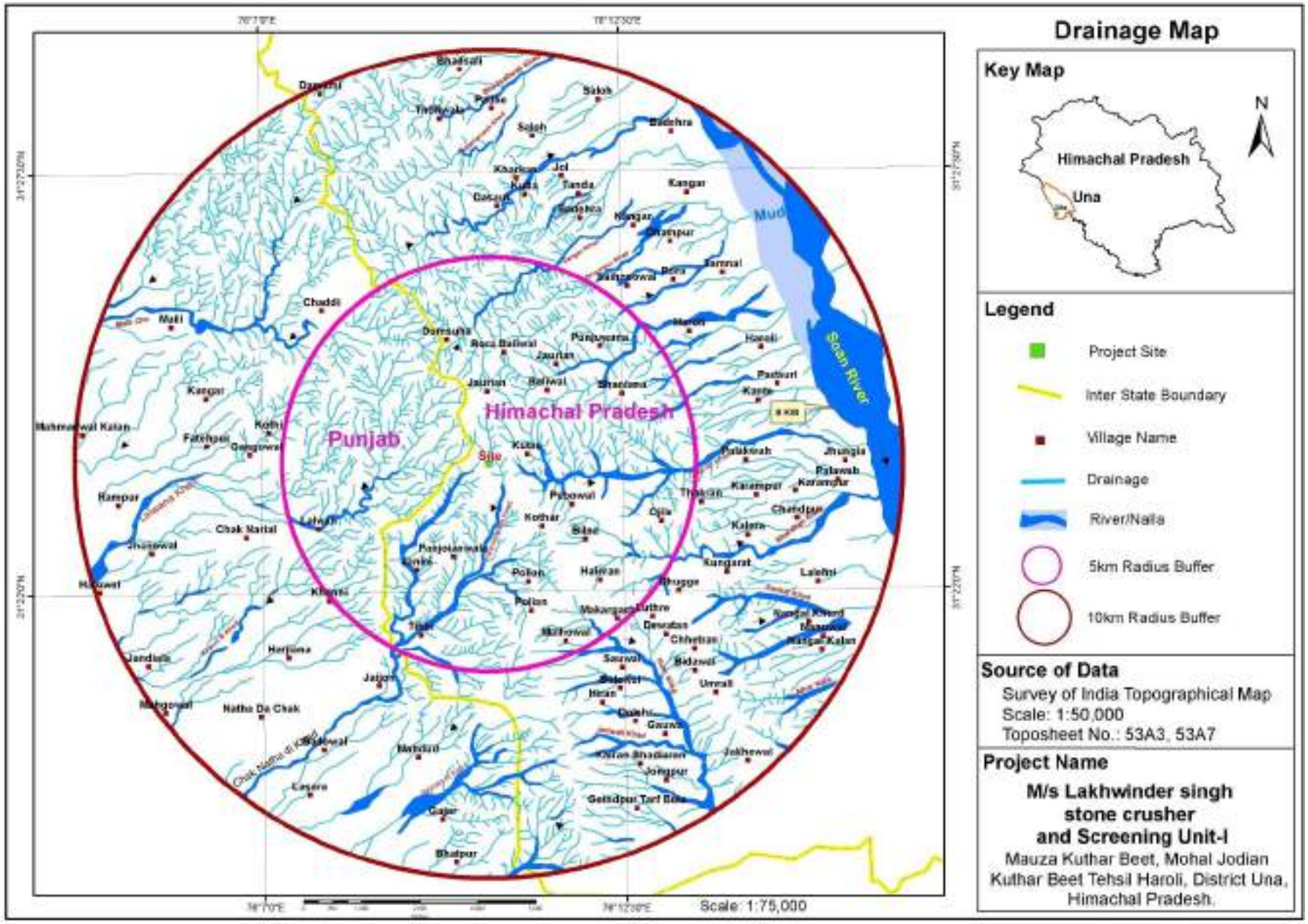


FIGURE 3-3: DRAINAGE MAP OF THE STUDY AREA

3.5 LAND USE COVER MAPPING

Since the mining is carried out by opencast mining method, studies on land environment of ecosystem play an imperative role in identifying susceptible issues and taking appropriate action to uphold ecological equilibrium in the region. The main objective of this section 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 mining activities on the surroundings can be assessed for future.

METHODOLOGY ADOPTED FOR THE MATIC DATA EXTRACTION FROM THE SATELLITE IMAGERIES

ERDAS image processing software and Arc GIS Software were used for the project. Erdas 9.2 Image Processing Software was used for digital processing of the spatial data. Digital image processing techniques were applied for the mapping of the land use/land cover classes of the provided area from satellite data.

- **Image Extraction**

Satellite imageries were obtained, and a sub set for the Area of Interest was created through ERDAS image processing software.

- **Geo-Rectification:**

Geometric correction includes correction for geometric distortions due to sensor, earth geometry variations and conversion of the data to real world coordinates (e.g., Latitude and Longitude) on -

referenced Topo-sheets and vector data.

- **Image Enhancement:**

Image enhancement is one of the important image processing functions primarily done to improve the appearance of the imagery to assist in visual interpretation and analysis. Various options of image enhancement techniques were tried out to get the best image for visual interpretation. Histogram equalized stretch enhancement techniques was applied to the imagery of the study area for better interpretation of different features in the satellite imagery.

- **Classification:**

Satellites images are composed of array of grid, each grid have a numeric value that is known as digital number. Smallest unit of this grid is known as a pixel that captures reflectance of ground features represented in terms of Digital number, which represent a specific land feature. Using image classification technique, the satellite data is converted into thematic information map

Hybrid technique has been used i.e. visual interpretation and digital image processing for identification of different land use and vegetation cover classes based on spectral signature of geographic feature. Spectral signature represents various land use classes Image interpretation keys are developed based on image characteristics like color, tone, size, shape, texture, pattern, shadow, association etc. which enables interpretation of satellite images for ground feature. Training sites are then assigned based on their spectral signature and interpretation elements.

Land use/Land cover Map has been broadly classified into five classes namely Agriculture, Forest Land, Built-up Area, Water Bodies and Waste Land and all other land uses have been categorized in others class. Using image classification algorithm land use map is than generated

Land Use/Land Cover Sandy

The present Land use/Land cover map for the proposed project activity is prepared by latest satellite image. This report thus will enable assessing the impact on land use pattern in the study area due to the proposed project activity.

(a) Data used

Current vintage data of Landsat-8 OLI/TIRS FCC (False Color Composite) downloaded from USGS Earth Explorer has been used for preparation of Land use/ Land cover thematic map of study area. The downloaded satellite data is already Georeferenced, and terrain corrected. A total number of seven bands have been stacked and resampled at 30 m resolution. Google earth was used as reference for the preparation of base layer data like road, rail network, villages and plant site.

Technical Details:

Satellite Image	Landsat-8OLI/TIRS
Satellite Data Source	USGS Earth Explorer
Software Used	ArcGIS 10.1 & e-Cognition 9.2

(b) Methodology

Land use/Land cover map preparation, base map creation; Layer Stacking of satellite image has been processed using ArcGIS 10.1 Software. The methodology used for present LU/study area is given below: - The LULC maps were generated using Landsat-8 satellite data for the date 09-Dec-2017, the bands used were ultra-blue, blue, green, red, Near Infra-Red (NIR), SWIR-1 and SWIR-2; these were stacked at 30 m of spatial resolution. Object oriented classification method was implemented in e-Cognition 9.2 software. In this classification approach the image is divided into objects by using multi-resolution segmentation. As this is a supervised classification algorithm sample objects are selected for all the classes from the segmented image. The mean of the selected bands are used as object features for differentiating classes form each other. Finally, nearest neighborhood classification algorithm is applied. Certain anomalies in classified output are removed using manual editing tool. The results were then exported as ESRI shape files into ArcGIS 10.1 and area calculation for different classes was done. The final map was prepared using ArcGIS layout view by adding all the layers and map information like North arrow, scale bar, legend and the title for the map.

TABLE 3-1: LAND USE PATTERN OF VILLAGES AROUND MINING LEASE AREA (CENSUS 2011)

Sr. No.	Name of Villages	Total Population	Male Population	Female Population
1	Rora Baliwal	1502	783	719
2	Haroli	1537	773	764
3	Bhadauri	1264	668	596
4	Palakwah	1854	914	940
5	Pubowal	2154	1126	1028
6	Kutharbeet	1420	708	712
7	Polianbeet	1295	662	633
8	Kungrat	808	401	407

Source: Approved Mine plan

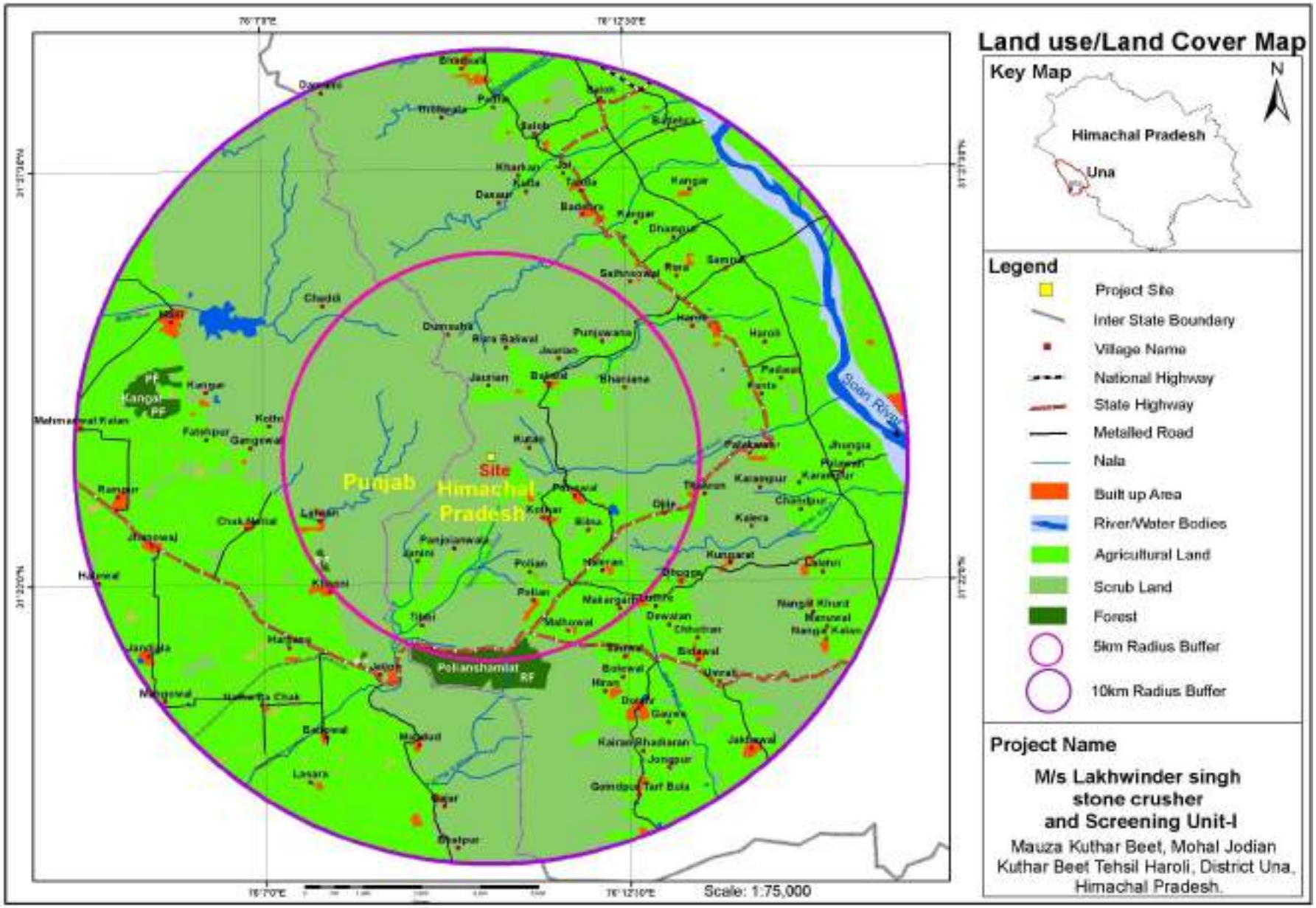


FIGURE 3-4: LAND USE AND LAND COVER MAP OF 5 KM STUDY AREA

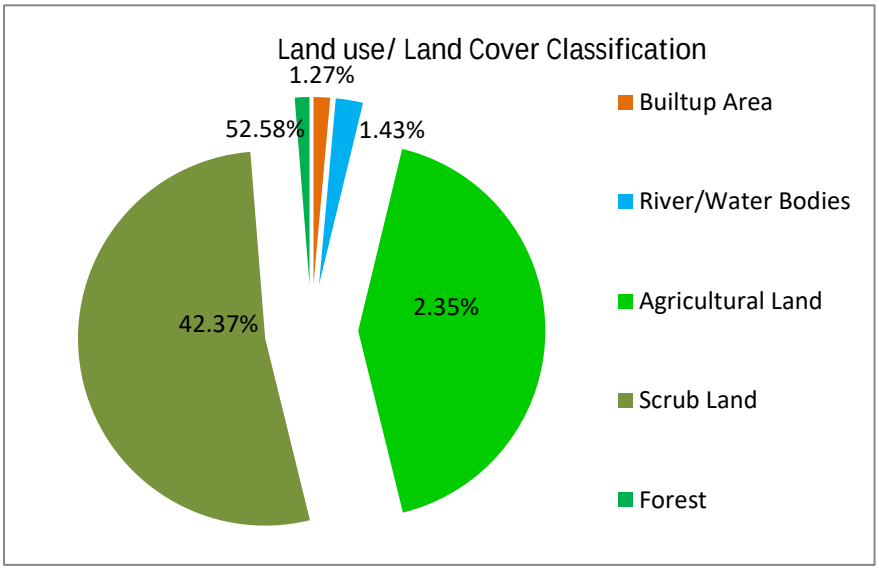


FIGURE 3-5: GRAPHICAL PRESENTATION OF LAND USE/ LAND COVER CLASSIFICATION

TABLE 3-2: LAND USE COVER OF THE STUDY AREA

S.no	Classes	Area in Ha	Percentage
1	Built up Area	450	1.43
2	River/Water Bodies	738	2.35
3	Agricultural Land	13312	42.37
4	Scrub Land	16517	52.58
5	Forest	398	1.27
Total		**31415**	**100**

3.6 SOIL ENVIRONMENT

3.6.1 Soil Characteristics

Soil fertility is an important aspect of the soil-plant relationship. Fertility status of the soils is primarily and importantly dependent upon both the macro and micronutrient reserve of the soil. Continued removal of nutrients by crops, with little or no replacement will increase the nutrient stress in plants and ultimately lowers the productivity. The fertility status of soil mainly depends upon the nature of vegetation, climate and topography, texture &decomposition rate of organic matter in the soil. Optimum productivity of any cropping systems depends upon adequate supply of plant nutrients.

The fertility of soil depends on the concentration of N, P, K, organic and inorganic materials and water. Nitrogen is required for growth of plant and is a constituent of chlorophyll, plant protein, and nucleic acids. Phosphorus is most often limiting nutrients remains present in plant cell nuclei and act as energy storage. It helps in transfer of energy. Potassium is found in its mineral form and affect plant cell division, carbohydrate formation, translocation of sugar, various enzyme actions and resistance to certain plant disease, over 60 enzymes are known to require potassium for activation.

It is essential to determine the potential of soil in the area to identify the current impacts of urbanization and industrialization on soil quality and predict impacts, which may arise due to the project operations. Accordingly, a study of assessment of the baseline soil quality has been carried out.

3.6.2 Protocol for Assessment of Soil physico-chemical Properties

Methods Manual of Soil Testing in India, Department of Agriculture& Cooperation, Ministry of Agriculture, Government of India, New Delhi, shall be followed for collection of soil samples, its preparation for testing and analyzing various physico-chemical properties of soil.

3.6.2.1 Selection criteria for Soil Sampling Location

For studying soil quality of the study area and with a view to ascertain the impacts due to construction activities on the nearby agriculture land forest land, six sampling locations, representing various land use conditions, were selected to assess the existing soil conditions in and around the project area of impact area. The location of the soil samples is presented in **Table 3-3** and shown in **Figure 3-6.**

TABLE 3-3: SOIL SAMPLING LOCATION

S. N	Location	Station code	Environmental Setting	Latitude and Longitude
1.	Project Site	S1/SQ-1	Hill Slope	31°23'39.58"N 76°10'28.35"E
2.	Polian Beet	S2/SQ-2	Forest	31°21'30.40"N 76°11'7.18"E
3.	Kuthar Beet	S3/SQ-3	Agriculture	31°22'48.85"N 76°11'30.26"E
4.	Pubowal	S4/SQ-4	Agriculture	31°23'6.57"N 76°11'38.90"E
5.	Baliwal	S5/SQ-5	Agriculture	31°24'34.28"N 76°11'21.05"E
6.	Haroli	S6/SQ-6	Agriculture	31°25'0.68"N 76°13'27.76"E

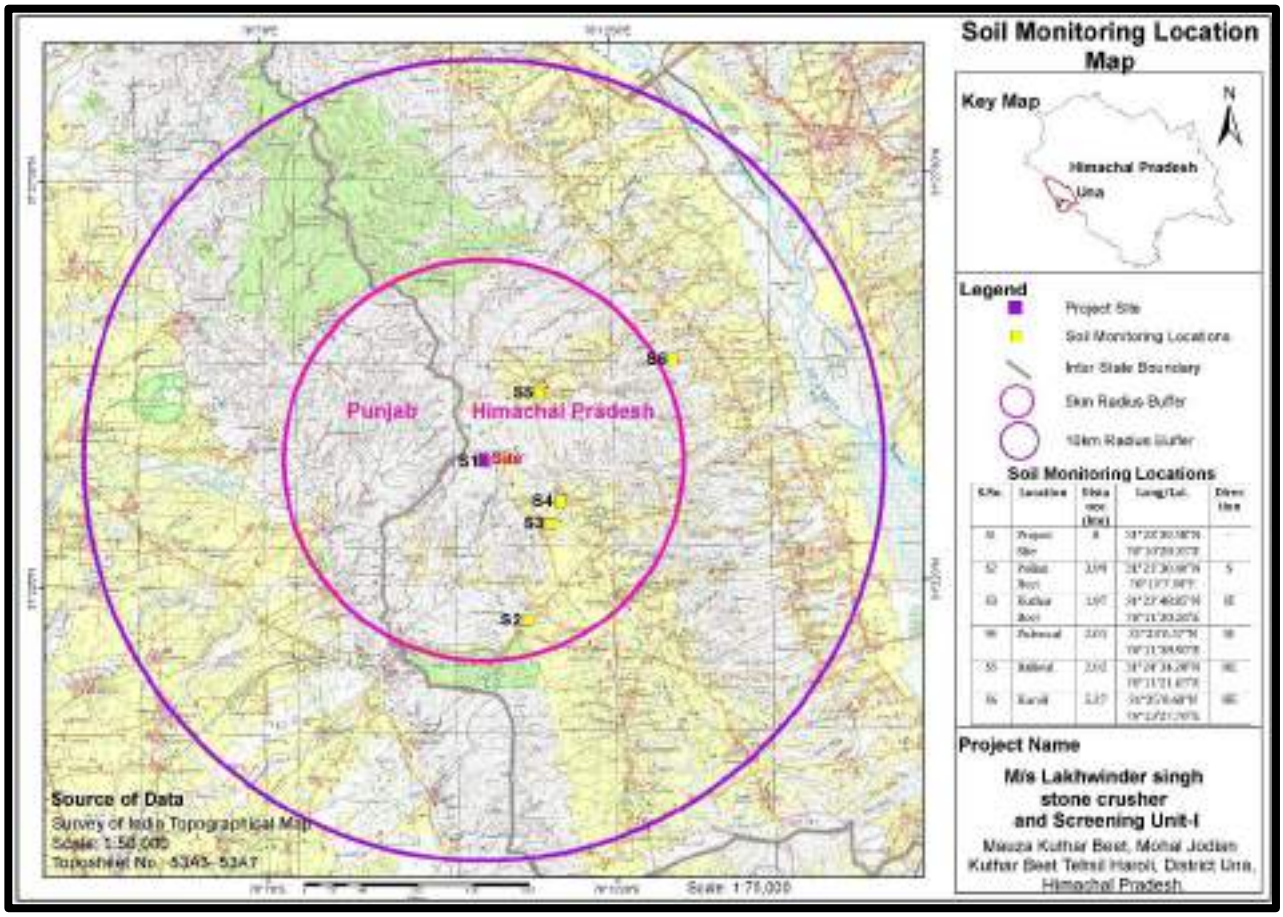


FIGURE 3-6 : SOIL SAMPLING LOCATIONS MAP

3.6.2.2 Soil reaction classes and critical limits for Macro and Micronutrients in soil

According to Soil Survey Manual (IARI, 1970), the soils are grouped under different soil reaction classes range of macro and micronutrients, organic carbon, SAR and electrical conductivity, which are extracted in **Table 3-4.**

TABLE 3-4: RANGE OF SOIL REACTION CLASS, MICRO AND MACRO NUTRIENTS

S.N	Soil Nutrients					Soil Fertility Range				
						Low	Medium		High	
1	Organic carbon as a measure of available Nitrogen (%)					<0.5	0.5-0.75		>0.75	
2	Available N (kg/ha)					<280	280-560		>560	
3	Available P (Kg/ha)					<10	10-24.6		>24.6	
4	Available K (kg/ha)					<108	108-280		>280	
5	Soil Reactivity	Extremely acidic	Very strongly acidic	Strongly acidic	Moderately acidic	Slightly acidic	Neutral	Slight alkaline	Moderately alkaline	Strongly alkaline
	pH Range	<4.5	4.5 5.0	5.1 5.5	5.6-6.0	6.1-6.5	6.6- 7.3	7.4-7.8	7.9-8.4	8.5-9.0
6	Micro Nutrients						Critical Levels (Deficient)		Critical Levels (Sufficient)	
(i)	Available Zinc (mg/l)						<0.6		>0.6	
(ii)	Available Boron (mg/l)						<0.5		>0.5	
(iii)	Available Iron (mg/l)						<4.5		>4.5	
(iv)	Available Manganese (mg/l)						<1.0		>1.0	
(v)	Available Copper (mg/l)						<0.5		>0.5	
7	Sodium Absorption Ratio									
	Excellent <1.0	Good 1-1.9	Fair 2- 3.9	Poor 4-7.9	Very Poor 8-14.9	Unacceptable>15				
8	Electrical Conductivity (mS/cm)									
	Salt free (0-2) Salinity effect negligible	Slightly Saline (4-8) Yield of many crops restricted	Moderately Saline (8-15) Only tolerant crops yield satisfactorily	Highly Saline >15, Only very tolerant crops yield satisfactorily						

3.6.3 Soil Quality Analysis

The samples have been collected from the depth of 5cm to 15cm and representative samples prepared by thoroughly mixing. The homogenized samples were analyzed for physico chemical characteristics. The physical and chemical analysis results of the soil samples collected at site during pre-monsoon 2021 are presented in **Table 3-5.**

TABLE 3-5: PHYSICO-CHEMICAL CHARACTERISTICS OF SOIL (POST-MONSOON, 2022)

S. No.	Parameters	Unit	Test Method	Project Site	Polian Beet	Kuthar Beet	Pubowal	Baliwal	Haroli
	Physical Characteristics								
1	Texture	USDA	STP/SOIL	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam
2	Porosity	%	STP/SOIL	53.2	54.7	52.5	52.8	54.7	55.5
3	Bulk Density	gm/cc	STP/SOIL	1.24	1.20	1.26	1.25	1.20	1.18
4	Water Holding Capacity	%	STP/SOIL	24.0	26.0	25.0	23.0	25.0	24.0
5	Permeability	cm/hr	STP/SOIL	1.18	1.34	1.30	1.26	1.42	1.21
6	**Particle Size Distribution**								
a.	Sand	%	STP/SOIL	65.00	62.00	68.00	66.00	62.10	60.00

S. No.	Parameters	Unit	Test Method	Project Site	Polian Beet	Kuthar Beet	Pubowal	Baliwal	Haroli
b.	Silt	%	STP/SOIL	15.00	18.00	13.50	12.00	15.20	16.00
c.	Clay	%	STP/SOIL	20.00	20.00	18.50	22.00	22.70	24.00
7	Texture			Sandy clay loam	Sandy clay loam	Sandy loam	Sandy clay loam	Sandy clay loam	Sandy clay loam
	Chemical Characteristics								
7	pH	-	IS:2720(Part-26)	7.54	7.89	7.12	7.60	7.26	7.40
8	Electrical Conductivity (EC)	µS/cm	IS:2720(Part-21)	280	312	350	326	398	320
9	CEC	meq/100gm	STP/SOIL	9.78	11.16	11.39	11.93	11.12	10.62
10	Organic Carbon	%	STP/SOIL	0.59	0.62	0.59	0.60	0.62	0.63
11	Organic Matter	%	STP/SOIL	1.01	1.07	1.00	1.03	1.07	1.08
12	SAR	-	STP/SOIL	2.11	2.13	1.85	1.96	2.17	2.19
13	Chloride as Cl	mg/kg	STP/SOIL	156.0	125.0	154.0	138.0	142.2	138.0
14	Calcium	mg/kg	STP/SOIL	860.0	923.0	950.0	1016.0	886.0	915.0
15	Magnesium as Mg	mg/kg	STP/SOIL	368.8	478.2	510.0	525.0	488.6	417.0
16	Sodium as Na	Mg/kg	STP/Soil	225.1	252.3	225.1	242.6	256.7	245.2
17	Zinc as Zn	mg/kg	STP/SOIL	2.14	1.89	2.34	1.78	1.65	2.54
16	Iron as Fe	mg/kg	STP/SOIL	7.02	5.61	8.85	4.60	7.14	8.20
17	Copper as Cu	mg/kg	STP/SOIL	0.21	0.35	0.27	0.32	0.25	0.26
18	Manganese as Mn	mg/kg	STP/SOIL	0.78	0.52	0.60	0.58	0.64	0.54
19	Exchangeable Sodium	%	STP/SOIL	10.0	9.8	8.6	8.8	10.0	10.0
20	Arsenic (as As)	mg/kg	STP/SOIL	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)
21	Lead (as Pb)	mg/kg	STP/SOIL	12.8	16.5	14.3	10.5	15.0	12.2
22	Cadmium (as Cd)	mg/kg	STP/SOIL	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)
23	Chromium (as Cr)	mg/kg	STP/SOIL	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)
24	Nickel (as Ni)	mg/kg	STP/SOIL	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)
	Available Nutrients								
25	Nitrogen as N	kg/ha	STP/SOIL	287.0	340.0	266.0	265.0	335.0	342.0
26	Phosphorus as P	kg/ha	STP/SOIL	19.3.0	21.0	17.1	17.8	20.7	22.4
27	Potassium as K	kg/ha	STP/SOIL	167.0	182.0	162.0	165.0	195.0	197.0

Interpretation of Soil Characteristics

Interpretation of Soil Characteristic has been dwelled in following sub-sections:

Soil Texture: The soil textures refer to proportion of mineral composition of soil i.e., sand, clay and silt present in the soil sample. The most commonly observed soil textures are sandy loam.

Soil pH: Soil pH is an important soil property, which affects the availability of several plant nutrients. It is a measure of acidity and alkalinity and reflects the status of base saturation. It measures the -ve logarithm of hydrogen ions activity of soil solution and defines the soil acidity and alkalinity. The soil pH ranges from 7.12 to 7.89, thereby indicating the soils are neutral to moderately alkaline.

Soil EC: The EC ranges from 280 398 , thereby indicating the soils are slightly saline.

Organic Carbon: The effect of soil organic matter on soil properties is well recognized. Soil organic matter plays a vital role in supplying plant nutrients, cation exchange capacity, improving soil aggregation and hence water retention and soil biological activity. The organic carbon content of soil varied from 0.59% to 0.63% thereby implying that soils are medium in organic carbon.

Available Nitrogen: Nitrogen is an integral component of many compounds including chlorophyll and enzyme essential for plant growth. It is an essential constituent for amino acids which is building blocks for plant tissue, cell nuclei and protoplasm. It encourages the aboveground vegetative growth and deep green color to leaves. Deficiency of Nitrogen decreasing rate and extent of protein-synthesis and result into stunted growth and develop chlorosis. Available nitrogen content in the surface soils ranges between 265.0 to 342.0 kg/ha thereby indicating that soils are low to medium in available nitrogen content.

Available Phosphorus: Phosphorus is important component of adenosine di-phosphate (ADP) and adenosine tri-phosphate (ATP), which involves in energy transformation in plant. It is essential component of deoxyribonucleic acid (DNA), the seat of genetic inheritance in plant and animal. Phosphorous take part in important functions like photosynthesis, nitrogen fixation, crop maturation, root development, strengthening straw in cereal crops etc. The availability of phosphorous is restricted under acidic and alkaline soil reaction mainly due to P-fixation. In acidic condition it gets fixed with aluminum and iron and in alkaline condition with calcium. Available phosphorus content ranges between 17.1 to 22.4 kg/ha thereby indicating that soils are Medium in available phosphorus.

Available Potassium: Potassium is an activator of various enzymes responsible for plant processes like energy metabolism, starch synthesis, nitrate reduction and sugar degradation. It is extremely mobile in plant and help to regulate opening and closing of stomata in the leaves and uptake of water by root cells. It is important in grain formation and tuber development and encourages crop resistance for certain fungal and bacterial diseases. Available potassium content in the soil ranges between 162 to 197 kg/ha, thereby indicating medium potassium content in the area.

Micronutrients: Proper understanding of micronutrients availability in soils and extent of their deficiencies is the pre-requisite for efficient management of micronutrient fertilizer to sustain crop productivity. Therefore, it is essential to know the micronutrients status of soil before introducing any type of land use.

Available Manganese: Manganese is essential in photosynthesis and nitrogen transformations in plants. It activates decarboxylase, dehydrogenize, and oxides enzymes. The available manganese content in surface soils ranged from 0.52 to 0.78 mg/kg i.e., below the critical limit of available manganese (1.0mg/kg)

Available Zinc: Zinc plays role in protein synthesis, reproductive process of certain plants and in the formation of starch and some growth hormones. It promotes seed maturation and production. As zinc content in soil of study area ranged from 1.65 to 2.54 mg/kg which is more than the critical limit (0.6mg/kg), most of the study area soils are more than sufficient in available zinc.

Available Copper: It is important for reproduction growth. It aids in root metabolism and helps in utilization of protein. The available copper in surface soils of the study area ranges from 0.21 to 0.35 mg/kg. As per the critical limit of available copper (0.5mg/kg), most of the study area soils are more than sufficient in available copper in the vicinity of the project.

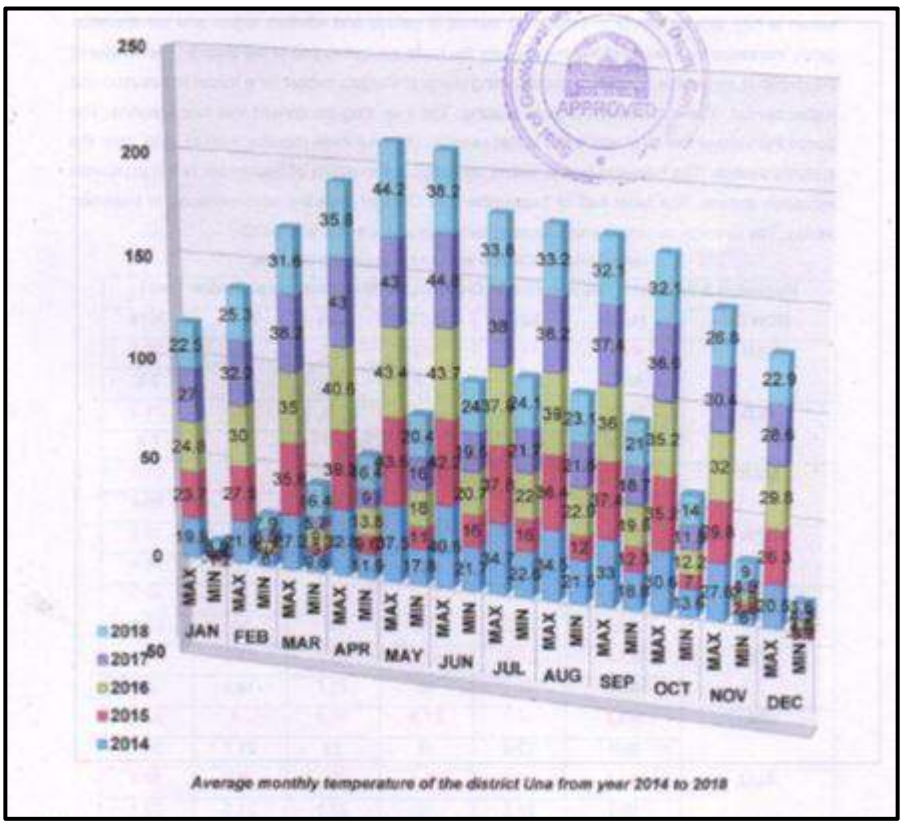
Available Iron: Iron in soil is important for formation of chlorophyll. The available iron in surface soils of the study area ranges from 4.60 to 8.20 mg/kg. As per the critical limit of available iron (4.5mg/kg), most of the study area soils are more than sufficient in available iron in the vicinity of the project.

Sodium Absorption Ratio: The SAR values vary from 1.85 to 2.19, thereby indicating good to fare ratio.

3.7 AIR ENVIRONMENT

METEOROLOGY DATA

The climate of the different part of the district depends to some extent on the elevation. The terrain is hilly with an elevation below 300 meters in valleys and western region and the elevation gently increases by few hundred meters over the north eastern region of the district. The climate of the district is somewhat like that of the adjoining plains of Punjab, except for a milder hot season and higher rainfall. He cold season is quite bracing. The year may be divided into 4 seasons. The period from Nov. to march is the winter season. The next three months, April to June, from the summer season. The following period lasting upto about the middle of September is the southwest monsoon season. The latter half pf September and October from the post monsoon or transition period. The average minimum and maximum temperature are 3°C and 45°C.



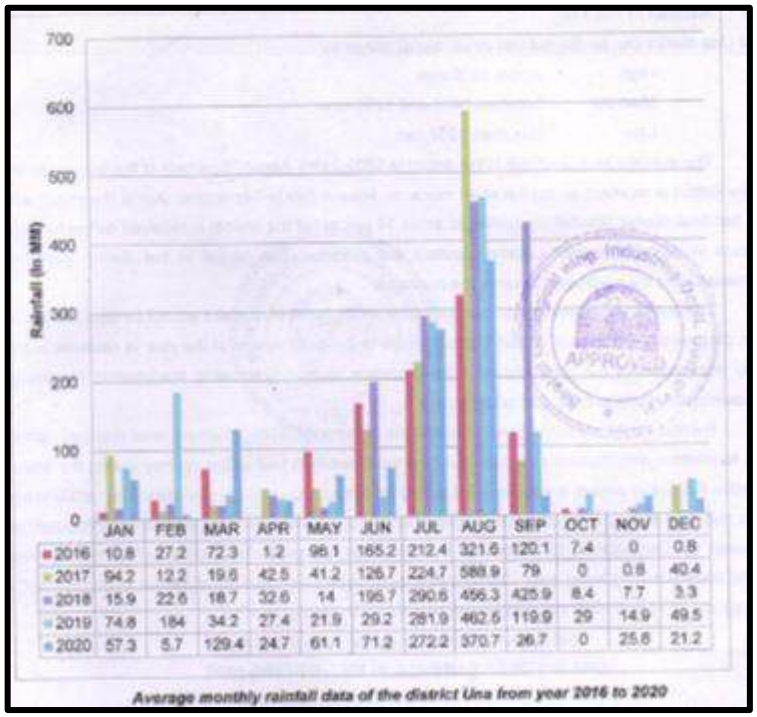
Average monthly temperature of the district Una from year 2014 to 2018

Rainfall

The una district can be divided into three rainfall zones as :

- High Above 1400 mm
- Medium between 1400 to 1200 mm
- Low less than 1200 m

The average annual rainfall in the district is 1209.00 mm. about 70% of the annual rainfall in the district is received during the short monsoon season July to September. July is the month with the heaviest rainfall. Rainfall amounting to about 14% of the normal is received during the cold season in association with passing western distribution. The rainfall in the district generally increases from the southwest towards the north east.



Source* Mining plan

Micro-Meteorological Data

UNA DISTRICT RAINFALL IN MILLIMETERS (R/F)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	RAIN FALL (IN mm)											
2016	10.8	27.2	72.3	1.2	96.1	165.2	212.4	321.6	120.1	7.4	0	0.8
2017	94.2	12.2	19.6	42.5	41.2	126.7	224.7	588.9	79	0	0.8	40.4
2018	15.9	22.6	18.7	32.6	14	195.7	290.6	456.3	425.9	8.4	7.7	3.3
2019	74.8	184	34.2	27.4	21.9	29.2	281.9	462.5	119.9	29	14.9	49.5
2020	57.3	5.7	129.4	24.7	61.1	71.2	272.2	370.7	26.7	0	25.8	21.2

Source: Meteorological Department, Govt. of India

Source: Mining Plan

Wind Rose

Wind speed of a site plays a vital role in predicting the extent of air pollution. It gives a clear view about the extent to which air pollutants are carried before they touch the ground. Wind rose is a diagrammatic of wind speed in a specified direction with its arms representing sixteen directions; each arm gives a clear percentage frequency distribution of wind speed. During the study period 2021 to 2021 for 24 hourly intervals to plot wind rose.

WIND PATTERN DURING THE STUDY PERIOD

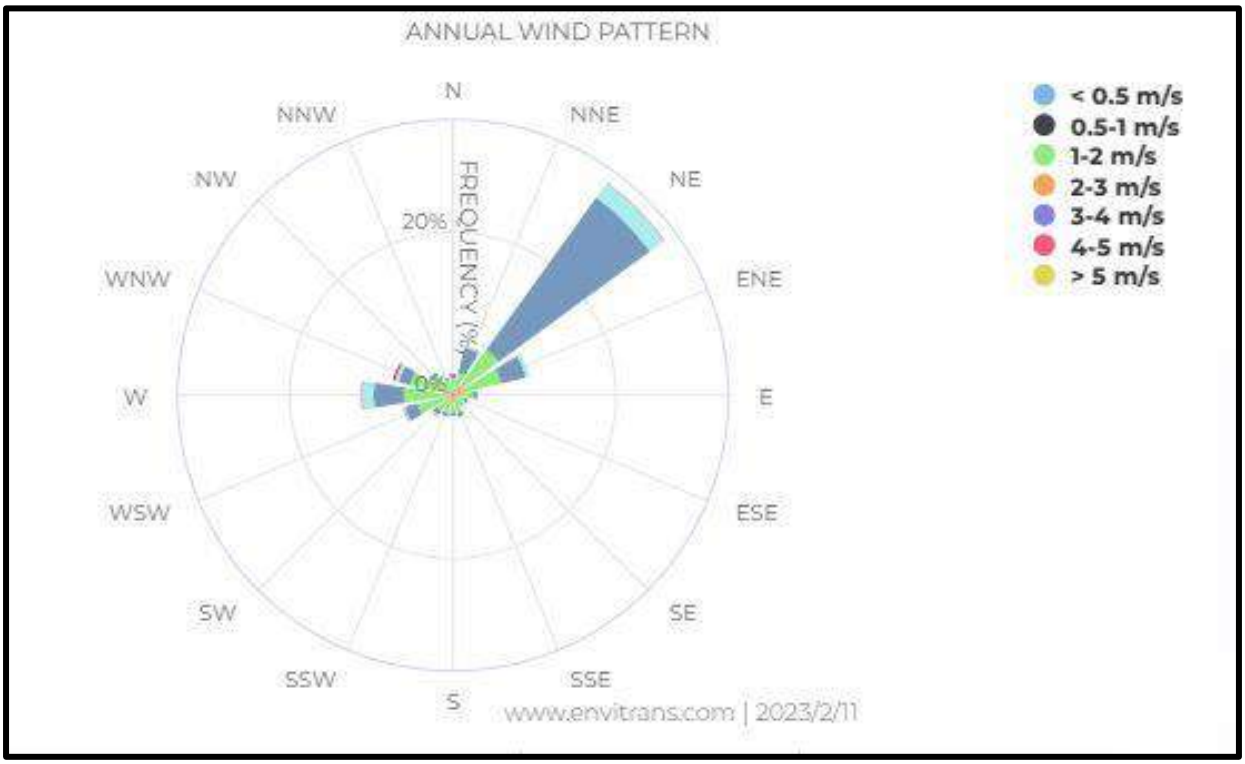


Table of Frequencies (%)

Direction	< 0.5 m/s	0.5-1 m/s	1-2 m/s	2-3 m/s	3-4 m/s	4-5 m/s	> 5 m/s	Total
N	0.23	0.18	1.80	0.64	0.00	0.00	0.00	2.85
NNE	0.09	0.73	2.01	3.20	0.23	0.00	0.00	6.26
NE	0.27	1.23	5.42	23.01	2.31	0.05	0.00	32.31
ENE	0.46	1.19	4.43	3.15	0.46	0.00	0.00	9.69
E	0.14	0.82	1.42	0.69	0.09	0.05	0.00	3.11
ESE	0.37	0.27	0.91	0.37	0.18	0.00	0.00	2.10
SE	0.09	0.41	0.82	0.23	0.05	0.05	0.09	1.74
SSE	0.32	0.64	1.28	0.46	0.00	0.05	0.05	2.80
S	0.32	0.73	1.14	0.37	0.00	0.00	0.00	2.56
SSW	0.18	0.68	1.42	0.46	0.05	0.00	0.00	2.79
SW	0.23	0.50	1.69	0.64	0.14	0.05	0.00	3.25
WSW	0.18	0.73	3.56	1.60	0.18	0.05	0.00	6.30
W	0.27	0.68	5.07	3.74	1.42	0.09	0.00	11.27
WNW	0.37	0.78	4.29	1.42	0.50	0.23	0.00	7.59
NW	0.23	0.78	2.05	0.41	0.09	0.00	0.00	3.56
NNW	0.18	0.37	1.46	0.18	0.00	0.00	0.00	2.19
Total	3.93	10.73	39.58	40.47	5.98	0.63	0.16	100

FIGURE 3-7 WIND ROSE OF MONITORING SEASON IN STUDY AREA

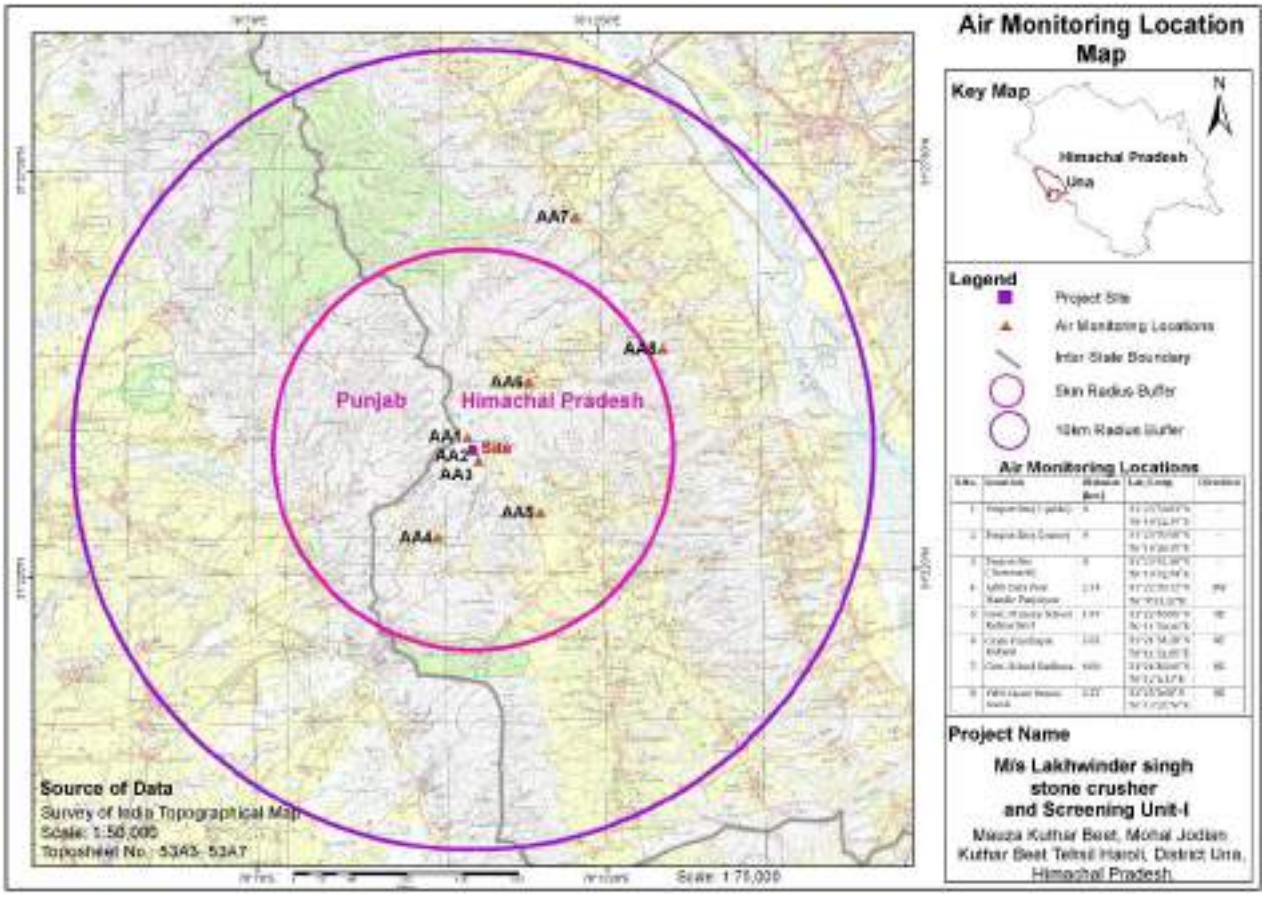


FIGURE 3-8: AMBIENT AIR MONITORING LOCATIONS

METHOD OF MONITORING: -

The Central Pollution Control Board (CPCB) has published comprehensive document on emission - Those procedures relevant to the particulate monitoring are summarized below.

a. Location of Ambient Air sampling Stations

Four sampling stations were established around the core zone within 10 km radius to study the present air quality. The locations are given below table.

TABLE 3-6 LOCATION OF AMBIENT AIR SAMPLING STATIONS

S.NO.	STATION NAME	DISTANCE (Km)	LATITUDE & LONGITUDE	DIRECTION
AA1	Project Site (Upside)	0	31°23'50.83"N 76°10'22.39"E	-
AA2	Project Site (Center)	0	31°23'39.58"N 76°10'28.35"E	-
AA3	Project Site (Downside)	0	31°23'31.40"N 76°10'32.74"E	-

AA4	Lakh Data Peer Mandir Panjoiyan	2.14	31°22'29.12"N 76° 9'53.32"E	NNE
AA5	Govt. Primary School Kuthar	1.97	31°22'48.85"N 76°11'30.26"E	NW
AA6	Gram Panchayat Baliwal	2.02	31°24'34.28"N 76°11'21.05"E	SW
AA7	Govt. School Badhera	6.86	31°26'48.66"N 76°12'6.32"E	NNE
AA8	PWD Guest House Haroli	5.27	31°25'0.68"N 76°13'27.76"E	WSW

b. Sampling Schedule

The baseline data monitoring period was (Oct. to Dec 2022) of . Eight hourly samples were collected from each station round the clock, twice a week for continuous (three months) one season (Oct. to Dec. 2022).

c. Air Quality parameter

The following parameters were analyzed for each sample

-Particulate matter (PM_{10})
- Particulate matter ($PM_{2.5}$)
- Sulphur dioxide (SO_2)
- Nitrogen dioxide (NO_2)
- Free Silica in PM_{10}
- Carbon mono-oxide
- NH_3(Ammonia)
- O_3 (Ozone)

The sampling and testing of ambient air quality parameters were carried out as per relevant parts of IS: 5182. The brief details of testing procedure adopted are given below:-

TABLE 3-7 PROCEDURE FOR DETERMINING VARIOUS AIR QUALITY PARAMETERS

S.No.	Parameters	Testing Procedure	NAAQS 2009 Standard (µg/m3)
1	**PM10**	RDS) IS: 5182(P-23) 2004	100(µg/m3)
2	**PM2.5**	Gravimetric method using fine particulate Sampler (FPS) IS: 5182(P-23) 2004	60(µg/m3)
3	**NO2**	Absorption in dil. Sodium Arsenic and then estimated calorimetrically with Sulphanilamide and N(I-Nepthayle) Ethylene diamine, Dihydrochloride and Hydrogen Peroxide IS: 5182(P-6)2006	80(µg/m3)

4	**SO2**	Absorption in Sodium Tetra Cloro Mercurate followed by Colorimetric estimation using P- Rosaniline hydrochloride and Formaldehyde IS: 51182(p-2)2001	80 (µg/m3)
5	**Free Silica in PM10**	FTIR Method	
6	**Carbon mono-oxide**	Detection by hand held CO indicator with least count 0.1 ppm (125 µg/m3)	2 mg/m3
7	**NH3(Ammonia)**	O3 Liberation of iodine when ozone absorbed in a 1% solution of potassium iodine buffered at pH 6.8 + 0.2. Iodine is determined spectrophotometrically by measuring the absorption of tri-iodide ion at 352 nm. (Guidelines for measurement of ambient air pollutants by CPCB)	400(µg/m3)
8	**O3 (Ozone)**	NH3 Indophenol Blue Method (Guidelines for measurement of ambient air pollutants by CPCB)	100 (µg/m3)

TABLE 3-8 AMBIENT AIR QUALITY RESULTS

AIR QUALITY PARAMETERS	LOCATION	MIN. (ug/m^3)	MAX. (ug/m^3)	AVG. (ug/m^3)	98% PERCE-NTILE	NAAQS LIMIT
PM_{10} ($\mu g/m^3$)	Project Site (Upside)	40.92	53.4	44.97	51.48	100($\mu g/m^3$)
	Project Site (Center)	41.26	52.88	42.62	52.32	
	Project Site (Downside)	42.76	54.98	46.15	54.25	
	Lakh Data Peer Mandir Panjoiyan	35.41	42.02	40.98	44.61	
	Govt. Primary School Kuthar Beet	36.67	47.21	42.46	46.54	

AIR QUALITY PARAMETERS	LOCATION	MIN. (ug/m^3)	MAX. (ug/m^3)	AVG. (ug/m^3)	98% PERCE-NTILE	NAAQS LIMIT
	Gram Panchayat Baliwal	40.02	52.97	48.08	52.94	
	Govt. School Badhera	39.86	50.63	42.80	48.77	
	PWD Guest House Haroli	38.71	52.81	43.90	50.78	
PM2.5 (µg/m3)	Project Site (Upside)	16.72	23.84	18.79	23.38	60(µg/m3)
	Project Site (Center)	14.69	22.75	17.93	22.17	
	Project Site (Downside)	15.94	24.90	18.11	23.91	
	Lakh Data Peer Mandir Panjoiyan	14.32	21.38	16.62	21.22	
	Govt. Primary School Kuthar Beet	9.57	15.93	13.79	15.13	
	Gram Panchayat Baliwal	20.96	32.97	27.97	32.09	
	Govt. School Badhera	13.19	23.47	16.30	22.16	
	PWD Guest House Haroli	14.48	24.32	18.63	23.46	
SO_2(µg/m3)	Project Site (Upside)	5.03	7.54	6.18	7.51	80(µg/m3)
	Project Site (Center)	5.37	7.65	6.64	7.54	
	Project Site (Downside)	5.93	7.53	6.72	7.51	

AIR QUALITY PARAMETERS	LOCATION	MIN. (ug/m^3)	MAX. (ug/m^3)	AVG. (ug/m^3)	98% PERCE-NTILE	NAAQS LIMIT
	Lakh Data Peer Mandir Panjoiyan	5.35	7.89	6.89	7.89	
	Govt. Primary School Kuthar Beet	3.84	6.25	4.92	5.72	
	Gram Panchayat Baliwal	5.78	8.2	6.88	8.19	
	Govt. School Badhera	4.92	6.51	5.64	6.41	
	PWD Guest House Haroli	5.84	9.83	7.91	9.82	
NOx (µg/m3)	Project Site (Upside)	8.84	10.9	9.80	10.89	80(µg/m3)
	Project Site (Center)	6.5	10.68	7.91	10.64	
	Project Site (Downside)	8.8	10.64	9.47	10.63	
	Lakh Data Peer Mandir Panjoiyan	8.54	10.98	9.95	10.98	
	Govt. Primary School Kuthar Beet	5.81	7.31	6.38	7.00	
	Gram Panchayat Baliwal	8.6	13.2	10.41	12.89	
	Govt. School Badhera	7.09	9.93	8.28	9.92	
	PWD Guest House Haroli	9.9	14.94	11.73	14.48	

AIR QUALITY PARAMETERS	LOCATION	MIN. (ug/m^3)	MAX. (ug/m^3)	AVG. (ug/m^3)	98% PERCE-NTILE	NAAQS LIMIT
CO	Project Site (Upside)	0.32	0.92	0.57	0.90	2 mg/m3
	Project Site (Center)	0.26	0.74	0.47	0.70	
	Project Site (Downside)	0.29	0.80	0.50	0.74	
	Lakh Data Peer Mandir Panjoiyan	0.45	0.55	0.51	0.55	
	Govt. Primary School Kuthar Beet	0.19	0.63	0.44	0.63	
	Gram Panchayat Baliwal	0.47	0.59	0.53	0.59	
	Govt. School Badhera	0.20	0.62	0.38	0.61	
	PWD Guest House Haroli	0.21	0.68	0.40	0.66	
NH_3	Project Site (Upside)	<20.0	<20.0	<20.0	<20.0	**400 µg/m³**
	Project Site (Center)	<20.0	<20.0	<20.0	<20.0	
	Project Site (Downside)	<20.0	<20.0	<20.0	<20.0	
	Lakh Data Peer Mandir Panjoiyan	<20.0	<20.0	<20.0	<20.0	
	Govt. Primary School Kuthar Beet	<20.0	<20.0	<20.0	<20.0	

AIR QUALITY PARAMETERS	LOCATION	MIN. (ug/m^3)	MAX. (ug/m^3)	AVG. (ug/m^3)	98% PERCE-NTILE	NAAQS LIMIT
	Gram Panchayat Baliwal	<20.0	<20.0	<20.0	<20.0	
	Govt. School Badhera	<20.0	<20.0	<20.0	<20.0	
	PWD Guest House Haroli	<20.0	<20.0	<20.0	<20.0	
O_3	Project Site (Upside)	<10.0	<10.0	<10.0	<10.0	**180 µg/m³**
	Project Site (Center)	<10.0	<10.0	<10.0	<10.0	
	Project Site (Downside)	<10.0	<10.0	<10.0	<10.0	
	Lakh Data Peer Mandir Panjoiyan	<10.0	<10.0	<10.0	<10.0	
	Govt. Primary School Kuthar Beet	<10.0	<10.0	<10.0	<10.0	
	Gram Panchayat Baliwal	<10.0	<10.0	<10.0	<10.0	
	Govt. School Badhera	<10.0	<10.0	<10.0	<10.0	
	PWD Guest House Haroli	<10.0	<10.0	<10.0	<10.0	

The National Ambient Air Quality Standards as notified on dated 18th November 2009, for Industrial as well as Residential, Rural and Other Area and results of monitoring are compared with the standards in Table 3-9.

TABLE 3-9 COMPARISON WITH AMBIENT AIR QUALITY STANDARDS (µG/M³).

Pollutants	Standard Laid Down by CPCB (18/11/2009) Industrial, Residential, Rural And Other Area	Max. Value Monitored in Study Area
PM10 µg/m3	100 (24-hours)	54.98
PM2.5 µg/m3	60 (24-hours)	32.97
SO2 µg/m3	80 (24-hours)	9.83
NOX µg/m3	80 (24-hours)	14.94
CO mg/m³	2 (08- hours)	0.92
NH_3 µg/m3	400(24-hours)	<0.20
O_3 µg/m3	180(24-hours)	<0.10

From the above table, it can be concluded that the maximum value of ambient air quality monitored during monitoring season in the study area does not exceed the limit laid down by CPCB for all the parameters.

3.7.1 Air Quality Index (AQI)

The table given below shows the Air Quality Index (AQI) range & category:

TABLE 3-10: AQI (IN µg/m3) OF THE SAMPLING LOCATIONS

Good (0–50)	**Minimal Impact**	**Poor (201–300)**	**Breathing discomfort to people on prolonged exposure**
Satisfactory (51–100)	**Minor breathing discomfort to sensitive people**	**Very Poor (301–400)**	**Respiratory illness to the people on prolonged exposure**
Moderate (101–200)	**Breathing discomfort to the people with lung, heart disease, children and older adults**	**Severe (>401)**	**Respiratory effects even on healthy people**

Source: CPCB AQI calculator

3.7.2 Observations of Results

PM_{10} : The maximum and minimum concentrations for PM_{10} were recorded as 54.98 µg/m^3 and 35.41 µg/m^3 respectively. The maximum concentration was recorded at Project Site and minimum concentration was recorded at Lakh Data Peer Mandir Panjoiyan.

$PM_{2.5}$: The maximum and minimum concentrations for $PM_{2.5}$ were recorded as 32.97 µg/m^3 and 9.57 µg/m^3 respectively. The maximum concentration was recorded at the Gram Panchayat Baliwal, and minimum concentration was recorded at Kuthar Beet.

SO_2: The maximum and minimum SO_2 concentrations were recorded as 9.83 µg/m^3 and 3.84 µg/m^3 respectively. The maximum & minimum concentrations were recorded at P.WD Guest House Haroli and minimum concentration was recorded at Kuthar Beet.

NOx : The maximum and minimum NOx concentrations were recorded as 13.2 µg/m^3 and 5.81 µg/m^3. The maximum concentration was recorded at Kuthar Beet, and minimum concentration was recorded at Gram Panchayat Baliwal.

TABLE 3-11 : AMBIENT AIR MONITORING STATIONS

S.No.	Monitoring stations	PM10	PM2.5	SO2	NOx	AQI value	AQI range
1	Project Site (Upside)	53.4	23.84	7.54	10.9	53	Good
2	Project Site (Center)	52.85	22.75	7.65	10.68	52	Satisfactory
3	Project Site(Down)	54.98	24.9	7.53	10.64	54	Satisfactory
4	Lakh Data Peer Mandir Panjoiyan	45.02	21.38	7.89	10.98	45	Good
5	Govt. Primary School Kuthar Beet	47.21	15.93	6.25	7.31	47	Good
6	Gram Panchayat Baliwal	52.97	32.97	8.2	13.2	52	Satisfactory
7	Govt. School Badhera	50.63	23.47	6.51	9.93	50	Satisfactory
8	PWD Guest House Haroli	52.81	24.32	9.83	14.94	52	Satisfactory

3.8 AMBIENT NOISE

As part of EIA study for the proposed project, Noise study was conducted by measurement the existing noise levels at various places around the site. The noise assessment was carried out with respect to the existing as well as the predicted noise that may come from the proposed project.

Noise level Monitoring Data

Noise level readings were recorded in 8 locations spread over, in the 10-km radius centering the proposed unit. Noise levels were recorded using a digital noise level meter; the instrument was calibrated before and after each set of readings. The monitoring was carried out on 24-hourly basis and the hourly Leq. Values were derived and reported

TABLE 3-12 : AMBIENT NOISE MONITORING LOCATION

S.NO.	STATION NAME	DISTANCE(Km)	DIRECTION	Latitude & Longitude
N1	Project Site	Project Site	---	31°23'39.58"N 76°10'28.35"E
N2	Pubowal	2.01	ESE	31°23'6.57"N 76°11'38.90"E
N3	Gram Panchayat Baliwal	2.02	SW	31°24'34.28"N 76°11'21.05"E
N4	Haroli	5.27	WSW	31°25'0.68"N 76°13'27.76"E
N5	Govt. Primary School Kuthar Beet	1.97	NW	31°22'48.85"N 76°11'30.26"E
N6	Polian Beet	3.99	South	31°21'30.40"N 76°11'7.18"E
N7	Govt School Badhera	6.86	NNE	31°26'48.66"N 76°12'6.32"E
N8	PWD Guest House Haroli	5.27	WSW	31°25'0.68"N 76°13'27.76"E

TABLE 3-13 : AMBIENT NOISE LEVEL OF STUDIED AREA

Sr.No.	Location Name	Results		Method
		Day Time Leq. dB (A)	NightTimeLeq.in dB(A)	
1.	Project Site	58.2	46.2	IS: 9989: 1981R-2002
2.	Pubowal	52.6	40.8	
3.	Gram Panchayat Baliwal	50.4	38.6	
4.	Haroli	54.1	42.0	
5.	Govt. Primary School Kuthar Beet	47.2	34.6	
6.	Polian Beet	48.4	36.2	
7.	Govt School Badhera	45.6	32.1	
8.	PWD Guest House Haroli	46.7	38.0	

TABLE 3-14 : AMBIENT NOISE QUALITY STANDARD (CPCB, 2009)

Area Code	Location Name	Day Time (6AM to 10PM db (A) Leg.	Night time (10PM to 6 AM db (A) Leg.
A	Industrial	75	70
B	Commercial	65	55
C	Residential	55	45

D	Silence Zone	50	40

RESULT & INTERPRETATION

Ambient noise levels were measured at 8 locations around the mining site. Noise level varies from 58.2 to 45.6 dB (A) during daytime and during nighttime levels ranges from 46.2 to 32.1 dB (A). Thus, ambient noise levels at all locations were observed to be within the prescribed limits and well.

3.9 WATER ENVIRONMENT

3.9.1 Hydrogeology of the Area

Hydro-geologically, the unconsolidated valley fill or alluvial formations, occurring in the valley area and semi-consolidated sediments belonging to Siwalik Group form aquifer system in the district. Porous alluvial formation forms the most prolific aquifer system in the valley area, where as the sedimentary semi-consolidated formation form aquifer of low yield prospect. The ground water in the Siwalik group of rocks occur under the unconfined to semi confined conditions, mainly in the arenaceous rocks viz., sandstone, siltstone, gravel boulder beds etc. The occurrence and movement of ground water is controlled by inter granular pore spaces and also the fracture porosity. Siwalik sediments underlie Hilly/undulating areas, where springs (mostly gravity/contact type) and bowties are the main ground water structures apart from hand pumps. The discharges of the springs, varies from seepages to 0.50 lps. Bowries are dug well type constructions on the hill slopes/ nalas for tapping the seepages. In the low-lying areas underlain by Siwalik rocks, dug wells and hand pumps are the main ground water structures, that range in depth from 3.00 to 25.00 m bgl, where in depth to water level ranges from 2.50 to 15.00 m bgl. In upland/plateau areas, the water level is generally deep. In Beet area water level is more than 60 m below land surface has been observed.

Source: https://cgwb.gov.in/District_Profile/HP/UNA.pdf

FIGURE 3-9 : HYDROGEOLOGICAL MAP OF UNA DISTRICT

Depth to Ground Water

As on March 2011, the stage of groundwater development in Una and Hum valleys of the district is 108% & 99% and falls under Critical category of development. There is thus no scope for further ground water development by constructing additional wells and tube wells in the valley area. However, tube wells can be constructed by tapping deeper aquifers of depth range of 300m.

Water quality in the study area

Chemical quality data of ground water from shallow as well as deep aquifers in the district, indicates that ground water is generally alkaline in nature and suitable both for domestic and irrigation use. All the parameters analysed are well within the permissible limit of safe drinking water, set by Bureau of Indian Standard (BIS). Proper monitoring is very much required.

Source: http://cgwb.gov.in/District_Profile/HP/Una.pdf

Methodology for Ground Water Monitoring

Ground water samples were examined for physico-chemical & bacteriological parameters in order to assess effect of mining activities on surface and groundwater. The samples were collected and analyzed as per procedures specified in 'Standard Method for the Examination of Water and Wastewater' published by American Public Health Association (APHA). Samples for chemical analysis were collected in polyethylene carbons. Samples for bacteriological analysis were collected in sterilized glass bottles. Selected physico-chemical and bacteriological parameters have been analyzed for projecting the existing water quality status in the study area. Parameters like temperature, dissolved oxygen (DO) and pH were analyzed at the time of sample collection. To evaluate the physico-chemical characteristics of the water resources existing in the study area, water samples from surface and ground water sources were collected during the post-monsoon season and analyzed for physico-chemical parameters. Ten samples of water drawn from different sources (Two surface and Six ground water have been analyzed as per prescribed testing standards. Surface water and Ground water monitoring locations are shown in **figure 3-11**.

Location of Sampling Stations

Six sampling stations covering ground and Six surface water were selected in the buffer zone of the study area is given in **Table 3-14**. The locations of water sampling stations have been shown in **Figure 3-11.**

TABLE 3-15: GROUND WATER & SURFACE WATER MONITORING LOCATIONS

GROUND WATER LOCATIONS				
S.NO.	**STATION NAME**	**DISTANCE(Km)**	**DIRECTION**	**Latitude & Longitude**
GW1	Pubowal Village	2.2	ESE	31°23'9.68"N 76°11'42.91"E
GW2	Baliwal Village	2.17	SW	31°24'38.76"N 76°11'23.39"E
GW3	Haroli Village	6.24	ENE	31°25'17.13"N 76°13'55.61"E

GW4	Kuthar Beet	2.65	SE	31°22'54.34"N 76°11'50.78"E
GW5	Polian	4.25	SSE	31°21'29.05"N 76°11'2.13"E
GW6	Dulehar	7.06	SSE	31°20'19.21"N 76°12'32.14"E
SURFACE WATER LOCATIONS				
S.NO.	**STATION NAME**	**DISTANCE(Km)**	**DIRECTION**	**Latitude & Longitude**
SW1	Panjoianwala Khad Upstream	0.02	WSW	31°23'37.27"N 76°10'26.70"E
SW2	Panjoianwala Khad Center	0.05	SSW	31°23'35.72"N 76°10'26.42"E
SW3	Panjoianwala Khad Downstream	0.08	SW	31°23'33.07"N 76°10'28.46"E
SW4	Jainini Khad downstream	0.25	SW	31°23'30.11"N 76°10'22.75"E
SW5	Tibbi	4.92	SSW	31°21'18.84"N 76° 9'2.04"E
SW6	Jaijon	5.40	SSW	31°21'1.30"N 76° 8'58.71"E

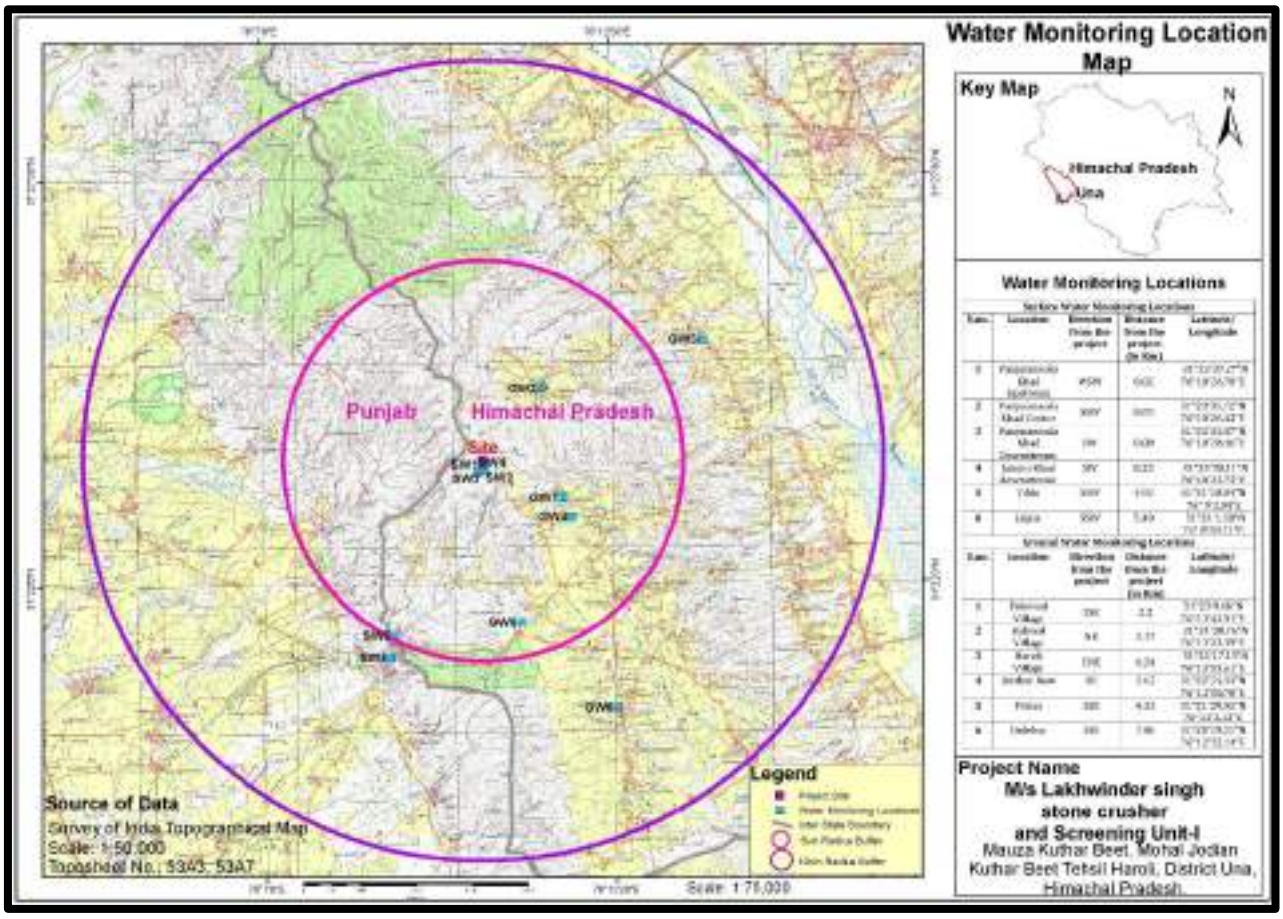


FIGURE 3-10:GROUND WATER & SURFACE WATER MONITORING LOCATIONS

TABLE 3-16: GROUND WATER TEST RESULTS

MICROBIOLOGICAL REQUIREMENT

RESULTS									
S.No.	Parameter	Test Method	(GW1)	(GW2)	(GW3)	(GW4)	(GW5)	(GW6)	Required as per IS-10500:2012
1.	Escherichia coli	IS-1622	Absent	Absent	Absent	Absent	Absent	Absent	Absent/100ml
2.	Coliform Bacteria	IS-1622	Absent	Absent	Absent	Absent	Absent	Absent	Absent/100ml

ORGANOLEPTIC & PHYSICAL PARAMETERS

S.No	Parameter	GW1	GW2	GW3	GW4	GW5	GW6	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Colour	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	Hazen Unit	5	15
2.	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	-	Agreeable	Agreeable
3.	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	-
4.	Turbidity	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NTU	1	5
5.	pH value	7.23	7.46	7.30	7.25	7.41	7.34	-	6.5-8.5	-
6.	Total Dissolve Solid (TDS)	312	389	296	410	372	400	mg/l	500	2000
7.	Electrical Conductivity	486	606	462	640	580	624	µmhos/cm	-	-

GENERAL PARAMETERS CONCERNING SUBSTANCES UNDESIRABLE IN EXCESSIVE AMOUNTS

S.No	Parameter	GW1	GW2	GW3	GW4	GW5	GW6	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Boron (as B)	BDL (<0.10)	BDL (<0.10)	BDL (<0.10)	BDL (<0.10)	BDL (<0.10)	BDL (<0.10)	mg/l	0.5	1.0
2.	Calcium (as Ca)	64.50	62.18	65.80	61.60	60.12	64.80	mg/l	75	200
3.	Chloride (as Cl)	18.60	15.40	14.21	16.20	14.56	18.02	mg/l	250	1000
4.	Copper (as Cu)	BDL (<0.05)	BDL (<0.05)	BDL (<0.05)	BDL (<0.05)	BDL (<0.05)	BDL (<0.05)	mg/l	0.05	1.5
5.	Fluoride (as F)	0.42	0.38	0.32	0.36	0.26	0.38	mg/l	1.0	1.5
6.	Iron (as Fe)	0.121	0.118	0.112	0.126	0.123	0.116	mg/l	0.3	No Relaxation
7.	Magnesium (as Mg)	12.40	5.19	15.12	2.91	5.39	2.91	mg/l	30	100

8.	Manganese (as Mn)	BDL (<0.10)	BDL (<0.10)	BDL (<0.10)	BDL (<0.10)	BDL (<0.10)	BDL (<0.10)	mg/l	0.1	0.3
9.	Nitrate (as NO3)	3.97	3.60	2.98	3.45	2.50	3.18	mg/l	45	No Relaxation
10	Sulphate (as SO4)	23.54	21.80	24.05	26.48	27.16	24.85	mg/l	200	400
11.	Alkalinity (as Ca CO3)	154	162	135	178	147	172	mg/l	200	600
12.	Total Hardness (as CaCO3)	110	134	102	166	128	150	mg/l	200	600
13.	Zinc (as Zn)	0.134	0.118	0.110	0.124	0.127	0.124	mg/l	5.0	15

Parameters Concerning Toxic Substances:

S.No.	Parameter	(GW1)	(GW2)	(GW3)	(GW4)	(GW5)	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Cadmium (as Cd)	BDL (<0.001)	BDL (<0.001)	BDL (<0.001)	BDL (<0.001)	BDL (<0.001)	mg/l	0.003	No Relaxation
2.	Cyanide (as CN)	BDL (<0.01)	BDL (<0.01)	BDL (<0.01)	BDL (<0.01)	BDL (<0.01)	mg/l	0.05	No Relaxation
3.	Lead (as Pb)	BDL (<0.01)	BDL (<0.01)	BDL (<0.01)	BDL (<0.01)	BDL (<0.01)	mg/l	0.01	No Relaxation
4.	Mercury (as Hg)	BDL (<0.001)	BDL (<0.001)	BDL (<0.001)	BDL (<0.001)	BDL (<0.001)	mg/l	0.001	No Relaxation
5.	Nickel (as Ni)	BDL (<0.01)	BDL (<0.01)	BDL (<0.01)	BDL (<0.01)	BDL (<0.01)	mg/l	0.02	No Relaxation
6.	Arsenic (as As)	BDL (<0.01)	BDL (<0.01)	BDL (<0.01)	BDL (<0.01)	BDL (<0.01)	mg/l	0.01	0.05
7.	Total Chromium (as Cr)	BDL (<0.05)	BDL (<0.05)	BDL (<0.05)	BDL (<0.05)	BDL (<0.05)	mg/l	0.05	No Relaxation

3.9.2 Observations of the Results

All the parameters are well within the permissible limits as per the IS: 10500:2012 of drinking water standard. pH was found in the range of 7.23-7.46. Total dissolved solid was found in the permissible range as 410 mg/l at Kuthar beet. The presence of all heavy metal is well within the permissible limit indicating there is no contamination in ground water due to natural formation or industrial activity in the area. Also, no toxicity was found in terms of presence of Cyanide or Mercury.

TABLE 3-17: SURFACE WATER TEST RESULTS

S.No.	Parameter	Units	Test Method	(SW1)	(SW2)	(SW3)	(SW4)	(SW5)	(SW6)
1	pH	--	IS:3025 (Part-11)	7.56	7.12	7.56	7.80	7.41	7.35
2	Turbidity	NTU	IS:3025 (Part-10)	10	3.8	4.5	5.2	4.0	3.2
3	Conductivity @250C	µS/cm	IS:3025 (Part-14)	389	320	360	380	412	354
4	Sulphate (SO4)	mg/l	IS:3025 (Part-24)	32	28	35	34	26	30

5	Nitrate (NO3)	mg/l	IS:3025 (Part-34)	3.2	2.8	3.4	3.8	4.1	3.6
6	Total Hardness (as CaCO3)	mg/l	IS:3025(Part -21)	110	98	112	123	108	125
7	Chloride (as Cl)	mg/l	IS:3025 (Part-32)	21	16	20	18	21	19
8	Fluoride (as F)	mg/l	APHA 4500F	0.56	0.41	0.48	0.50	0.34	0.42
9	COD (as O2)	mg/l	APHA-5220 B	16	14	18	20	21	28
10	Iron (as Fe)	mg/l	IS:3025 (Part-53)	0.24	0.16	0.20	0.24	0.12	0.10
11	Dissolve Oxygen	mg/l	IS-3025 (Part-38)	6.2	6.5	6.0	5.8	6.6	6.4
12	Total Dissolved Solid	mg/l	IS:3025 (Part-16)	2962	205	230	245	264	228
13	BOD (3 days at 270C)	mg/l	IS:3025 (P-44)	2.5	2.2	2.8	3.2	4.0	4.5
4	Calcium (as Ca)	mg/l	IS:3025 (Part-40)	78.5	76.8	89.2	82.5	110	102
15	Magnesium (as Mg)	mg/l	IS:3025 (Part-46)	20.8	22.7	26.80	20.1	40.4	31.4
16	Arsenic (as As)	mg/l	IS:3025 (Part-37)	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
17	Lead (as Pb)	mg/l	IS:3025 (Part-47)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
18	Copper (as Cu)	mg/l	IS:3025 (Part-42)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
19	Zinc (as Zn)	mg/l	IS:3025 (Part-49)	0.35	0.21	0.26	0.32	0.19	0.14
20	Manganese (as Mn)	mg/l	IS:3025 (Part-59)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
21	Total Chromium (as Cr)	mg/l	IS:3025 (Part-52)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
22	Aluminum (as AI)	mg/l	IS:3025	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
23	Total Alkalinity (as CaCO3)	mg/l	IS:3025(Part -23)	114	105	120	126	115	128
24	Oil and Grease	mg/l	IS:3025)	<2	<2	<2	<2	<2	<2
25	Total Suspended Solid	mg/l	IS:3025 (Part-17)	8.5	7.2	8.1	8.4	10.0	12.4
26	Cyanide as CN	mg/l	IS:3025	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
27	Mercury (as Hg)	mg/l	IS:3025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

28	Phenolic Compounds (as C6H5OH)	mg/l	IS:3025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
29	Total Coliform	MPN/ 100ML	IS-1622	3.5 x 104	2.8x 103	4.6 x 103	4.8 x 103	3.2 x 103	2.8 x 103

RESULT & INTERPRETATION

The results for surface water samples collected within the study area were compared with standard limits. The pH was found to be in the range of 7.12-7.80, TDS was in the range of 296-205 mg/I, enclosed as **ANNEXURE-X.** Remaining all the parameters including trace elements were within the limits or below detectable limits as per standard prescribed under Environment Protection Rule 1986.

The analysis report of the water sample collected from the different surface water sources (River) in study area show that the water is used for the domestic purposes but only after

***Test reports are attached as* ANNEXURE-X**

The surface water quality comparison with CPCB water quality criteria is given below:

TABLE 3-18: CPCB WATER QUALITY CRITERIA

Designated-Best-Use	**Class of water**	**Criteria**
Drinking water source without conventional treatment but after disinfection	A	Total Coliforms Organism MPN/100ml shall be 50 or less; PH between 6.5 and 8.5; Dissolved Oxygen 6mg/I or more
Outside bathing (organized)	B	Total Coliforms Organism MPN/100ml shall be 500 or less; PH between 6.5 and 8.5; Dissolved Oxygen 6mg/I or more
Drinking water source after conventional treatment and disinfection	C	Total coliform organism MNP/100ml shall be 5000 or less; PH between 6 to 9 Dissolved Oxygen 4mg/I or more
Propagation of Wildlife and fisheries	D	PH between 6.5 and 8.5; Dissolved Oxygen 4mg/I or more Free Ammonia (as N)1.2 mg/I or less
Irrigation, Industrial Cooling, Controlled waste disposal	E	PH between 6.0 and 8.5; Electrical conductivity at 25oC micro mhos/cm Max.2250; Sodium absorption ratio26 Boron Max. 2kg/cm
	Below-E	Not meeting A, B, C, D and E criteria

3.10 TRAFFIC DENSITY

Traffic density measurements were performed at two locations for MDR-39 & NH 503 about 4.3 km in South Direction and NH about 16 km in East Direction. The Monitoring was performed during study period. The results of measurements are given in **Table 3-18**.

Methodology: Traffic density measurement were made 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. 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 three categories were determined.

TABLE 3-19: EXISTING TRAFFIC SCENARIO & LOS

Road	V	C	Existing V/C Ratio	LOS
MDR 39	480	1900	0.25	B
NH 503	1400	5800	0.24	B

Source: Capacity as per IRC: 64-1990

V= Volume of Vehicles in PCU's/day & C= Capacity of Road in PCU's/day

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

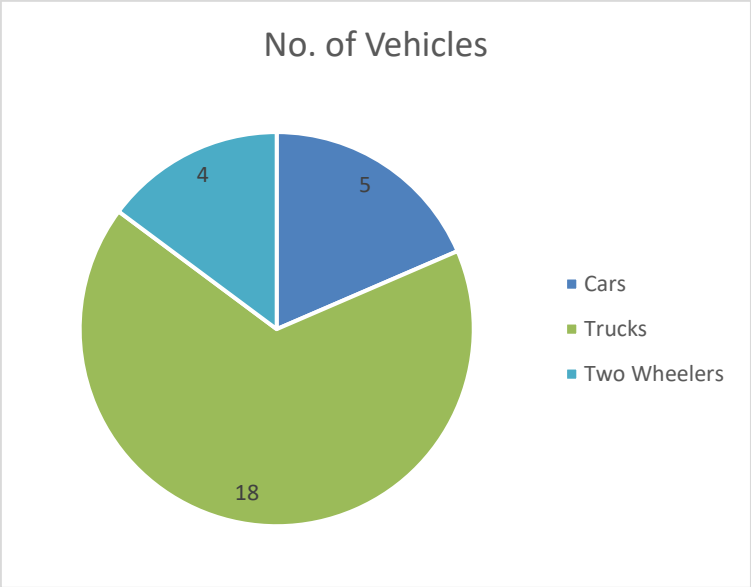
Reference: ENVIS Technical Report, IISc, Bangalore.

During mine operation traffic intensity
Total Production : 3,54,258 MTPA
No. of working days : 270 Days
Per day capacity of mine : 1296 tonnes/day
Trolley/Truck capacity : 9 tonnes
No. of trip deployed : 144 trips/day
Working hours per days : 8 hours
No. of trucks deployed/h : Approx. 18 trucks
Increase in PCU/day will be 75 PCUs

TABLE 3-20: TRAFFIC INCREASE DUE TO PROJECT ACTIVITY

S.No.	Type of Vehicle	Vehicle Distribution/ day	PCU	No. of Vehicles in PCU/day
1	Cars	5	1	5
2	Trucks	18	3.7	66.6
3	Two Wheelers	4	0.75	3

	27		**74.6**



Road	**V**	**C**	**Modified V/C Ratio**	**LOS**
MDR 39	480+75=555	1900	0.29	B
NH 503	1400+75=1475	5800	0.25	B

Result of traffic assessment

From the traffic study it is observed that there is minimal increase of vehicles on the existing highways. Therefore, the additional load on the carrying capacity of the concerned roads is not likely to have any adverse effect on the LOS. The value of LOS

3.11 BIOLOGICAL ENVRONMENT

Biological diversity comprises the variability of genes, species and ecosystems and is very crucial for maintaining the basic processes on which the life depends. Broadly it can be divided into two types i.e. the floral diversity and faunal diversity. Conservation of the biodiversity is essential for the sustainable development as it not only provides the food, fodder and medicine but also contribute in improvement of essential environmental attributes like air, water, soil, etc.

Before starting any Environmental Impact Assessment study, it is necessary to identify the baseline of relevant environmental parameters which are likely to be affected as a result of operation of the proposed project. A similar approach has been adopted for conducting the study on Biological Environment for this Project. Both terrestrial and aquatic ecosystems have been studied to understand the biological environment.

3.11.1 Biological Aspects of the Study Area

Plant In general the area is a part of Siwalik range. Their present-day morphology is comprised of hogback ridges, consequent, subsequent, ob-sequent, and re-sequent valleys of various orders, gullies, choes (seasonal streams), and earth-pillars, semi-circular Choe-divides, talus cones,

colluvial cones, water-gaps, and Choe terraces. Associated badlands features include the lack of vegetation, steep slopes, high discharge density, and rapid erosion rates. To the south of the Siwalik are the Indo-Gangetic plains and in the north, they are bordered by the lesser Himalayas.

The Una district is bounded by plains of Punjab in the west and Sola Singhi Dhar (Siwalik Range) in the East. The ranges trend in general NW-SE direction and in between there is a longitudinal valley of the Soan Nadi (Swan River). The altitude varies from 300 meters to over 1200 meters above MSL on Sola Singhi Dhar. The width of the Jaswan Dun Valley ranges from 7 km to 14 km and the district town of Una, which is almost in the middle of the Dun valley (Jaswan Valley), is on the elevation of 427 Meters above MSL. In general, most of the district lies between 600-900 meters elevation and slope angle is less than 10°.

Description of the Area in which the lease is situated

The mining lease area falls in the Garni Khad which is a tributary of the Soan River. The total area of the Soan river catchment is 1215 Sq Km and that of Garni Khad is 71.1 Sq Km The highest point of the leased-out area is 436 m above MSL and lowest point of the leased out area is 433 m above MSL. The width of the Garni Khad at the place of mining varies from 200 meters to 370 meters. During monsoon floods, the water level rises by about one meter at times for short spells . (Source)

Geology of the area

The Siwalik group is divisible into three subgroups respectively the Lower, Middle and Upper based on the lithostratigraphy. Lower Siwalik: The lower Siwalik consists essentially of a sandstone-clay alternation. In district Una, the lower sequence of the lower Siwalik consists of medium-grained subgraywacke (dark-coloured sedimentary rock that contains from 65 to 95 percent free quartz, in grains 0.06 to 2 mm in diameter, held together by a matrix with a low mud content and often a high carbonate content) interbedded with thick red clay, but higher up in sequence, sandstones are coarser and clasts become more frequent while the clays are less developed. The uppermost horizon of conglomerate with well-rounded clasts of grey quartzite possibly derived from the Shali formations. The total thickness is 1600 meters. Middle Siwalik: The Middle Siwalik Sub group comprises of large thickness of coarse micaceous sandstone along with some interbeds of earthy clay and conglomerate. It normally succeeds the lower Siwalik along a gradational contact. The sandstone is less sorted than those in lower Siwalik are. Clay bends are dull colored and silty. The general thickness is 1400 to 2000 meters. Upper Siwalik: The upper Siwalik is mainly represented by sandstone inter-bedded with silt and conglomerate beds. The lower portion of the Upper Siwalik mainly consists of soft, massive, pebbly sandstone with intercalation is replaced by the clays intercalations. The general thickness in the district is 2300 meters. Older Alluvium: The older Alluvium in Dun valley is designated as Dun Gravels while it is a multi-cyclic sequence of brown to grey silt, clay with kankar and reddish brown to grey micaceous sand with pebbles & cobbles. Newer Alluvium: Newer Alluvium has been subdivided into Fan Alluvium composing brownish grey clay, sand and gravel, white to grey colored cobble and pebble sequence, and lies dis-conformably over older Alluvium within a narrow zone immediately to the south of Siwalik hill. Trace alluvium exposed as depositional terraces of Soan nadi, is composed of cyclic sequence of grey, micaceous, fine to coarse grained sand, silt, clays and cobble and pebbles. Channel alluvium exposed as point bar/channel bars within the active channels is composed of grey, fine to coarse micaceous sand and silts along with cobbles and pebbles of the fan and terrace alluvium. (Mining Department, Una. HP)

Forests cover in Una district:

The Una district has 521 km2 forest cover out of which 18 km2 is very dense, 298 km2 is moderately dense and 205 km2 is open forest (India State of Forests Report 2009), now the total forest cover is increased to 523 km2 in which moderately dense forest is increased to 302 km2 due to enhanced plantation activities undertaken in recent past by the State Forest Department and spurt in agro-forestry practices in the state and open forest area cover is decreased to 203 km2 (India State of Forest Report 2011). The area comprises of agricultural land and riverine vegetation. Due to high temperature and humidity the area comprises of Tropical Dry Deciduous vegetation. No

-

10 km radius of the proposed mining area. However RF namely Dharoi RF & Akoi ki Dhar PF is located in North within the study area.

Methodology, Study period, survey sites etc.:

Detailed survey was conducted to evaluate floral and faunal composition of the study area. Primary data on floral and faunal composition was recorded during site visit and secondary data was collected from the Forest department and published relevant literature. 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 in **Table 3.20.**

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

Pre-monsoon : May-2011
Core zone : At the project site along Garni Khad river,
Buffer zone : Around the project site in 10 km radius.

3.21 MODE OF DATA COLLECTION & PARAMETERS CONSIDERED DURING THE SURVEY

Aspect	Data	Mode of data collection	Parameters monitored
Terrestrial Ecology	**Primary data collection**	**By field survey**	**Floral and Faunal diversity**
	Secondary data collection	From authentic sources like Forests department of Una, ***Himachal and available Taxonomic publication like*** • [Himachal Pradesh Development Report By Planning Commission of India New Delhi (2006)] • Flora Simlensis, by Sir Henry Collett Thacker & Spink, Calcutta Public Domain under Indian Copyright Act-1957. • Book if Indian Birds by Salim Ali published by **BNHS.]**	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 department of Una and available field	Floral and Faunal diversity and study

		guide book like - Book of Indian Reptiles and Amphibians published by BNHS	of vegetation, forest type, importance etc.

3.11.2 General Vegetation Study of the area:

The study area comprise of Sub-Tropical Dry Deciduous vegetation. Several tropical elements can be seen scattered in the area. Species of *Saccharum, Calotropis, Vitex, Zizyphus, etc. are of common occurrence. Tree species viz. Acacia catechu, Albizia lebbeck, Dalbergia sissoo, Morus alba, etc*. are found planted along the boundary of the agricultural lands and along the road sides.

Ground vegetation mainly consists of grasses and small shrubs. Among the grasses, *Vetiveria zizanioides, Cenchrus ciliaris* are very common in the area. Useful fodder grasses, *Cynodon dactylon, Eleusine indica, Trifolium alexandrinum,* etc. are present in the proposed project area.

The large weeds which infest uncultivated tracts are *aak (Calotropis procera), arind (Ricinus communis), dhatura (Datura metel) and thor (Opuntia stricta).* Other noxious weeds and those which appear in crops are *pohli or thistle (Carthamus oxyacantha), shial kanta (Argemone mexicana), kandyari (Solanum virginianum) and bhang (Cannabis sativa).*

Flora of the Core zone : The core zone comprises of Garni Khad river bed, where mining operation is proposed. This area consists of riparian vegetation in which aquatic and marshland plants are the main component. Most among them are weeds. No ecologically sensitive plant species has been reported from this area.

Riparian vegetation: Riparian vegetation is found along the river side. In stagnant water growth of hydrophytes likes *Hydrolea zeylanica, Ipomoea carnea, Ludwigia adscendens, Marsilea minuta, Sagittaria sagittifolia, Spilanthes paniculata, Typha latifolia, etc*. can be commonly observed.

Flora of the Buffer zone (Terrestrial vegetation)

Buffer zone of the proposed project is mainly agricultural land. The flora of buffer zone comprises of plants growing on the edges of agricultural land, village woodlots and trees planted along the roads. Many tree species are planted in the area because of their usefulness, economic and aesthetic values. The tree species observed in the area are, Aam *(Mangifera indica), Khair (Acacia catechu), Siris (Albizia lebbeck), Semal (Bombax ceiba), Behul (Celtis australis), Shisham (Dalbergia sissoo), Ritha (Sapindus mukorossi), Tut (Morus alba) etc.*

In agricultural waste land and along the road side, growth of weeds and grasses like Argemone *mexicana, Cannabis sativa, Cenchrus ciliaris, Heteropogon contortus, Lantana camara, Parthenium hysterophorus, etc.* are very common. These weeds are affecting the agricultural productivity of the region due to fast growth, short life cycle and enormous production of seeds.

Agricultural land: Himachal Pradesh is mainly known for agriculture. More than 80% land is under cultivation. The surrounding area of the proposed project site is well drained by rivers hence are much fertile. Most of the land in study area is under agriculture, based on the satellite imaginary data. The Una district has different types of soils and agro-climatic conditions which are quite suitable for growing various types of cereals, vegetables, temperate and stone fruits. Crops which are grown are *Wheat (Triticum aestivum), Maize (Zea mays), Rice (Oryza sativa), Sugarcane (Saccharum officinarum), etc*. Seasonal vegetables are also grown by village people as cash crops.

Waste land:

Most of the areas nearby Core zone are waste land. Commonly seen plant species in such areas are *Cannabis sativa, Lantana camara, Ipomea carnea, Calotropis procera, Cassia tora, Parthenium hysterophorus, Ziziphus mauritiana, Heteropogon contortus, Argemone Mexicana, etc.* These weeds are affecting the agricultural productivity of the region due to fast growth, short life cycle and enormous production of seeds.

Vegetation in and around human settlement:

Vegetation pattern in villages and surrounding areas are slightly different from the rest of the areas. The common species grown near villages are mostly edible or useful plants such as *Mangifera indica, Syzigium cumini, Azadirachta indica, Albizia lebbeck, Delonix regia, Tamarindus indica, Eucalyptus sp., Ficus religiosa, etc.*

A list of flora of the study area is enclosed as Table 3.21 & 3.22.

TABLE 3-22: FLORA IN THE STUDY AREA (CORE ZONE)

S.No.	Species	Family	Habit
1	*Albizia lebbeck*	Fabaceae	Tree
2	*Bauhinia variegata*	Fabaceae	Tree
3	*Celtis australis*	Cannabaceae	Tree
4	*Dodonaea viscosa*	Sapindaceae	Shrub
5	*Ipomea aquatica*	Convolvulaceae	Shrub
6	*Morus alba*	Moraceae	Tree
7	*Saccharum munja*	Poaceae	Grass
8	*Sapindus mukorossi*	Sapindaceae	Tree
9	*Cenchrus ciliaris*	Poaceae	Grass
10	*Vetiver zizanioides*	Poaceae	Grass
11	*Vitex negundo*	Lamiaceae	Shrub
12	*Zizyphus* sp.	Rhamnaceae	Shrub

TABLE 3-23: FLORA IN THE STUDY AREA (BUFFER ZONE)

S.No.	Species	Family	Habit
1.	*Abutilon indicum*	Malvaceae	Herb
2.	*Acacia catechu*	Fabaceae	Tree

3.	*Acacia nilotica*	Fabaceae	Tree
4.	*Achyranthes aspera*	Amaranthaceae	Herb
5.	*Adhatoda vasica*	Acanthaceae	Shrub
6.	*Ageratum conyzoides*	Asteraceae	Herb
7.	*Albizia procera*	Mimosaceae	Tree
8.	*Barleria cariatata*	Acanthaceae	Herb
9.	*Bauhinia variegata*	Fabaceae	Tree
10.	*Boerhavia diffusa*	Nyctaginaceae	Herb
11.	*Bombax ceiba*	Bombacaceae	Tree
12.	*Carissa carandas*	Apocynaceae	Shrub
13.	*Cassia fistula*	Fabaceae	Tree
14.	*Celtis australis*	Ulmaceae	Tree
15.	*Cissampelos pareira*	Menispermaceae	Climber
16.	*Cordia dichotoma*	Boraginaceae	Tree
17.	*Cryptolepis buchanani*	Asclepiadaceae	Climber
18.	*Dalbergia sissoo*	Fabaceae	Tree
19.	*Datura stramonium*	Solanaceae	Shrub
20.	*Dicliptera bupleuroides*	Acanthaceae	Herb
21.	*Dodonaea viscosa*	Sapindaceae	Shrub
22.	*Eucalyptus sp.*	Myrtaceae	Tree
23.	*Eupatorium species*	Asteraceae	Herb
24.	*Euphorbia royleana*	Euphorbiaceae	Shrub
25.	*Ficus benghalensis*	Moraceae	Tree
26.	*Ficus palmata*	Moraceae	Tree
27.	*Ficus religiosa*	Moraceae	Tree
28.	*Ficus rumphii*	Moraceae	Tree
29.	*Jasminum dispermum*	Oleaceae	Shrub
30.	*Lantana camara*	Verbenaceae	Shrub
31.	*Mallotus philippensis*	Euphorbiaceae	Tree
32.	*Mangifera indica*	Anacardiaceae	Tree
33.	*Malva parviflora*	Malvaceae	Shrub
34.	*Morus alba*	Moraceae	Tree
35.	*Murraya koenigii*	Anacardiaceae	Shrub
36.	*Phoenix sylvestris*	Arecaceae	Tree
37.	*Populus deltoides*	Salicaceae	Tree
38.	*Sida acuta*	Malvaceae	Herb
39.	*Solanum nigrum*	Solanaceae	Herb
40.	*Terminalia arjuna*	Combretaceae	Tree
41.	*Terminalia bellirica*	Combretaceae	Tree
42.	*Terminalia chebula*	Combretaceae	Tree
43.	*Tinospora cordifolia*	Menispermaceae	Climber
44.	*Urena lobata*	Malvaceae	Shrub
45.	*Xanthium strumarium*	Asteraceae	Shrub
46.	*Ziziphus mauritiana*	Rhamnaceae	Shrub

3.11.3 Wild life and Avifauna of the study area:

The major part of the study area lies under agriculture field and human settlements which restrict the wildlife habitat significantly. Most of the mammalian species reported in the study area are domesticated animals. There is neither any wildlife sensitive area nor any corridor for the movement of wildlife is present in the study areas.

There are many rivulets present in the buffer zone of study area which are the major attraction sites for avifauna. Common Myna, Kingfisher, Spotted dove, Pintail and Pond Heron are some dominant bird species present in the study area. Migratory movement of birds in the study area has not been reported. As far as the reptile community was concerned, rat snake, python and house lizard are reported from the study area.

A list of animals of the study area has been prepared on the basis of local inquiry from the village people and from the available published literatures. The animals thus recorded were cross checked with *Wildlife (Protection) Act*, 1972 for their schedule. No established habitats of any mammals or birds are noticed in river bed and along the banks.

The fauna of study area can be grouped in to aquatic and terrestrial as the core area mostly comprises of aquatic fauna and the buffer area provides shelter to the terrestrial animals.

Aquatic fauna: Aquatic fauna mostly comprises of Amphibians, Molluscs & Fish which cannot survive without water. The aquatic fauna of the project site is given as below:

Avian fauna rns are noticed in the core zone. Local birds are noticed crossing over the banks in search of food. No fixed pattern in migratory behavior is noticed.

Amphibian: Amphibians are commonly found at the places along the margin of aquatic and terrestrial systems. Due to presence of water bodies like river, nalas, etc. the study area is providing shelter to many amphibian species. Some of the commonly reported species are *Bufo melanostictus* (common Indian toad), *Euphlyctis cyanophlyctis* (Indian skipper frog), *Hoplobatrachus tigerinus* (Indian bull frog) etc.

Fish: The fish species which are commonly found in the Garni Khad River of the proposed site are Labio bata (Bhangan or Bata), Gudusia chapara (Chappera or Palla), Labio rohita (Dumra or Dhambra), Notopterus notopterus (Pari or Battu), Catla catla (Theila), etc

Molluscs: Fresh water molluscs play very important role in aquatic ecosystems. Many species serve as food for many aquatic animals as well as for human. Species like Bellamya benghalensis, Pila globosa, Brotia costula, Angulyara oxytropis and Lemellidens marginalis play an important role in human food.

Terrestrial fauna:

Mammals: Many domesticated mammal species are reported from buffer zone during the field survey. Common grazing animals like Buffalo, cow, goat etc. can be noticed in open grass fields. Small mammals like Indian palm squirrel (*Funambulus palmarum*) and field mouse (*Apodemus sylvaticus*) are noticed in vicinity of village. Inquiry from village people regarding wild animals reveals that Rhesus macaque *(Macaca mulatta)*, Indian hare (*Lepus nigricollis*), fruits bat (*Pteropus conspicillatus*), Nilgai (*Boselaphus tragocamelus*), mongoose (*Herpestes edwardsii*), jackal (*Canis aureus*), etc. are often seen in the area.

Avifauna: Water birds like Gadwall (Anas strepera), Common teal (Anas crecca), White throated kingfisher (Halcyon smyrnensis), Pied kingfisher (Ceryle rudis), Red wattled lapwing etc are noticed. House crow (Corvus splendens), House sparrow (Passer domesticus), Common hill Myna (Gracula religiosa), Red-rumped Swallow (Cecropis daurica), Hoopoe (Upupa epops ceylonensis) are of common occurrence.

Reptiles: The reptilians species commonly reported are Agama (*Laudakia tuberculata*) in settlement area, Garden lizard (*Calotes versicolor*) and *Eutropis macularia* along shady places in agricultural field or where growth of bushes is noticed. Among non-poisonous snakes rat snakes (*Ptyas mucosus*) are commonly noticed in field, followed by poisonous snakes like Cobra (*Naja naja*) and Banded krait (*Bungarus multicinctus*) are reported to be seen by farmers.

A list of Fauna of the study area is presented in Table 3.23 & 3.24

TABLE 3-24 LIST OF FAUNA IN THE CORE ZONE

Sr. No.	Common Name	Scientific Name	Wildlife schedule	IUCN Red List Status
Avian fauna (Bird)				
1	Common Myna	*Acridotheres tristis*	IV	LC
2	Indian roller	*Coracias benghalensis*	IV	LC
3	House Crow	*Corvus splendens*	-	LC
4	Indian Cuckoo	*Cuculus micropterus*	IV	LC
5	Fork-tailed Drongo	*Dicrurus adsimilis*	IV	LC
6	Koel	*Eudynamys scolopacea*	IV	NA
7	Little Green Bee-	*Merops orientalis*	-	LC
8	Sparrow	*Passer domesticus*	IV	LC
9	Rose-ringed	*Psittacula krameri*	IV	LC
10	Pied Myna	*Sturnus contra*	IV	LC
11	Hoopoe	*Upupa epops ceylonensis*	-	DD
Fishes				
1	Reba carp	*Cirrhinus reba*	LC	Reba carp
2	Chappera or Palla	*Gudusia chapra*	DD	Chappera or
3	Boga Labeo	*Labeo boga*	LC	Boga Labeo
Amphibians				
1	Common Indian	*Bufo melanostictus*	LC	Common

2	Indian skipper frog	*Euphlyctis cyanophlyctis*	LC	Indian skipper
3	Indian bull frog	*Hoplobatrachus tigerinus*	LC	Indian bull

LC: Least Concern, VU: Vulnerable, NA: Not Assessed, DD: Data deficient.

TABLE 3-25: FAUNA OF THE BUFFER ZONE

S.No.	Common Name	Scientific name	Wildlife Schedule	IUCN Red Category
Wild Animals (Mammals)				
1	Field mouse	*Apodemus sylvaticus*	-	LC
2	Nilgai	*Boselaphus tragocamelus*	III	LC
3	Golden Jackal	*Canis aureus*	II	LC
4	Wild dog	*Cuon alpinus*	II	DD
5	Indian Palm Squirrel	*Funambulus palmarum*	IV	LC
6	Indian Grey Mongoose	*Herpestes edwardsii*	II	LC
7	Indian hare	*Lepus nigricollis*	-	LC
8	Rhesus macaque	*Macaca mulatta*		LC
9	Fruits bat	*Pteropus conspicillatus*	-	LC
10	Rat	*Rattus rattus*	V	DD
11	Wild pig	*Sus scrofa*	III	LC
Domestic Animals:				
1	Cow	*Bos indicus*		NA
2	Buffalo	*Bos bubalis*		DD
3	Goat	*Capra aegagrus hircus*		DD
Avian flora (Birds):				
1	Jungle Myna	*Acridotheres fuscus*	IV	LC
2	Common Myna	*Acridotheres tristis*	IV	LC
3	Pintail (Duck)	*Anas acuta*	IV	LC
4	Common Teal	*Anas crecca*	IV	LC
5	Mallard (wild duck)	*Anas platyrhynchos*	IV	LC
6	Gadwall	*Anas strepera*	IV	LC
7	Pond Heron	*Ardeola grayii*	IV	DD
8	Spotted Owlet	*Athene brama*	IV	LC
9	Common pochard	*Aythya ferina*	IV	LC
10	Cattle Egret	*Bubulcus ibis*	IV	LC
11	Red-rumped Swallow	*Cecropis daurica*	-	DD
12	Pied kingfisher	*Ceryle rudis*	IV	DD
13	Blue Rock Pigeon	*Columba livia*	-	LC
14	Oriental Magpie Robin	*Copsychus saularis*	IV	LC
15	Indian roller	*Coracias benghalensis*	IV	LC
16	House Crow	*Corvus splendens*	V	LC
17	Common Cuckoo	*Cuculus canorus*	IV	LC
18	Fork-tailed Drongo	*Dicrurus adsimilis*	IV	LC
19	Asian Koel	*Eudynamys scolopacea*	IV	NA
20	Common hill Myna	*Gracula religiosa*	IV	LC
21	White-breasted King	*Halcyon smyrnensis*	IV	LC
22	Small Green Bee Eater	*Merops orientalis*	-	LC
23	House Sparrow	*Passer domesticus*	IV	LC

24	Rose ringed Parakeet	*Psittacula krameri*	IV	LC
25	Red vented Bulbul	*Pycnonotus cafer*	IV	LC
26	Spotted Dove	*Streptopelia chinensis*	IV	NA
27	Pied Myna	*Sturnus contra*	IV	LC
28	Marsh Sandpiper	*Tringa stagnatilis*	IV	LC
29	Common Babbler	*Turdoides caudatus*	IV	NA
30	Hoopoe	*Upupa epops ceylonensis*	IV	NA

Reptiles & Amphibians

S.No.	Common Name	Scientific name	WPA	IUCN
1	Common Toad	*Bufo melanostictus*	IV	LC
2	Skipping frog	*Bufo stomaticus*	IV	LC
3	Krait	*Bungarus caeruleus*	IV	NA
4	Banded krait	*Bungarus multicinctus*	-	NA
5	Kashmir Rock Agama	*Laudakia tuberculata*	-	NA
6	Bronze Grass Skink	*Eutropis macularia*		NA
7	Garden lizard	*Calotes versicolor*	-	NA
8	House lizard	*Hemidactylus frenatus*	-	LC
9	India bull frog	*Hoplobatrachus tigerinus*	-	DD
10	Cobra	*Naja naja*	II	LC
11	Rat snakes	*Ptyas mucosus*	-	NA

LC: Least Concern, NA: Not Assessed, DD: Data deficient, NT: Near Threatened.

3.12 SOCIO-ECONOMIC REPORT

3.12.1 INTRODUCTION:

Social Impact Assessment is a major prerequisite to begin any new project. Social impact assessment is mandatory for expansion of any project too. Opencast mining involves extraction of Sand, Stone & Bajri with dumping of waste along with other operations as carrying out extracted sand and bajri. All these operations can disturb environment of the area in various ways, such as removal of mass, change of landscape, flora and fauna of the area, surface drainage, and change in Air, Water and Soil quality. While for purpose of development and economic upliftment of people, there is need for establishment of industries and mining, but these must be sustainable and environmental friendly. Therefore, it is essential to assess the impacts of mining on different environmental parameters, before starting the mining operations, so that abatement measures could be planned in advance for eco-friendly mining in the area. The likely impacts on socio economic aspects due to this mining project taking into consideration the kind of activities involved and mitigation are discussed.

General information about the project site: - Mining of Sand, Stone & Bajri from Giri River proposed by Sh. Lakhwinder Singh Prop. M/s Lakhwinder Singh Stone Crusher and Screening Unit-I, having lease area of 7.2135 hectare located at Khasra No. 1165, 1166, 1169, 1173, 1174,

1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227, Mauza Kutharbeet Mohal Jorrian in Tehsil Haroli, District Una, Himachal Pradesh. The Una is the nearest town on the NE direction from the project site about 12.20 Km away. This Place is on the border of the Himachal Pradesh and Punjab State. Inter-State boundary of Himachal and Punjab is about 0.27 Km (Arial Distance) West direction. Una is a district in the Indian state of Himachal Pradesh. Una shares its border with the Hoshiarpur districts of Punjab.

Una has facilities for many Schools, Colleges, Petrol pumps, Hospitals, Temples, Hotels, ATMs, Bus stops etc.

Nangal , Nawanshahr , Hoshiarpur , Phagwara are the nearby Cities to Haroli.

3.12.2 Study Area:

The study area consists of the core area and the buffer zone. The core area is where the project is expected to come up and a buffer area encircling the project area with a radius of 10 kilometers from the periphery of the project site. The study area consists of mining areas and rural villages. There are a total 55 villages, which fall within 10 Km radius from the project site. Longitude and Latitude of the site are given below: -

Sr. No.	Latitude	Longitude
1	31° 23' 53.47" N	76° 10' 22.51" E
2	31° 23' 29.23" N	76° 10' 32.01"E

The site is located at about 31° 23' 53.47"North Latitude and 76° 10' 22.51"East Longitude.

As a language Hindi is used by the majority of locals followed by Pahari and Punjabi.

3.12.3 Methodology:

For Socio-Economic Impact Assessment of the project at Mauza Kuthar Beet, Mohal Jodian Kuthar Beet Tehsil Haroli, District Una, Himachal Pradesh. Collection of primary and secondary data has been done. Accordingly, both qualitative and quantitative data was analyzed from secondary sources. Census 2011 was the main source for collection of secondary data. Collection and evaluation of baseline data for various socio-economic parameters in and around the proposed sites has been done (within 10 km radius of the study area from the lease boundary). Villages within the study area are being identified from a survey of India toposheet. **Figure-3-1**

radius of boundary.

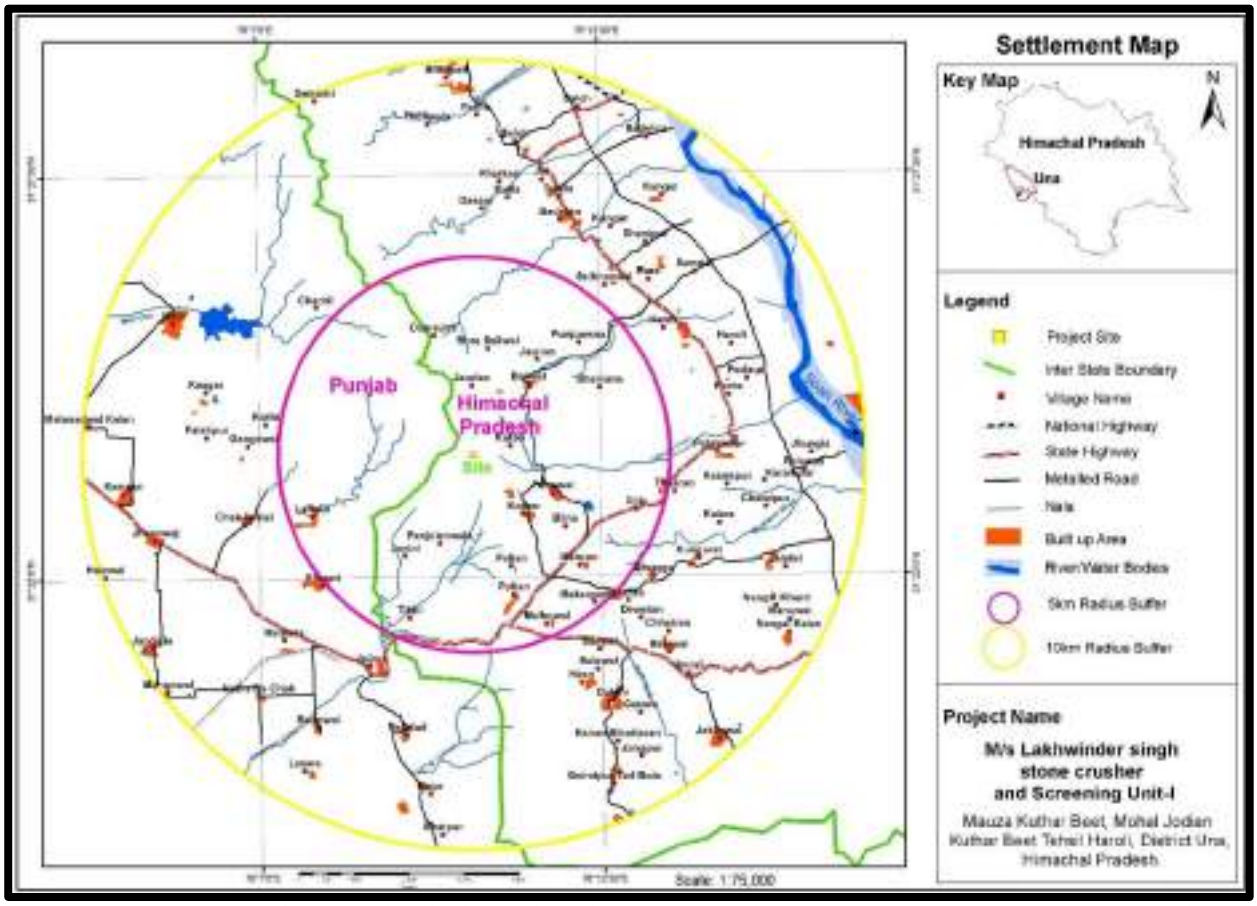


FIGURE 3-11: SHOWING LOCATION OF VILLAGES' WITHIN10 KM RADIUS OF BOUNDARY.

3.12.4 BASELINE DATA

For impact assessment both primary and secondary data was collected. While primary data was collected through census-cum sample survey in the core area and sample survey in the buffer area, the secondary data was collected from administrative records, published reports and websites.

Una District is having total population of about 5.21 lakh where the majority i.e., 91.38% of the population lives in rural areas as compared to 8.61% in urban areas. In this district cultivators constitute the majority of the population. The sex ratio of the district over all Rural as well as Urban is 976.

Total 55 villages are found in the radius of 10 km from project site as per toposheet. According to the 2011 census data populations of district Una (Himachal Pradesh). Among 55 villages 33 villages found in Himachal region & rest 22 villages falling in Punjab region.

The majority of the people depend on Agriculture with the proposed project the occupational pattern of the people in the area will change with making more people engaged in industrial and business activities.

The study area is falling under the 10 Km buffer zone of Una Tehsil Haroli and as well as of Hoshiarpur District Tehsil Garhshanker. So, the details of both districts are presented below.

TABLE 3-26: Demographic and occupational profile of the Study area within 10 km radius from the project site in Himachal Pradesh

	Total HH	TotaPopulation	Male	Female	Population below 6 yrs.	SC Population	ST Population	No of literate	Total worker	Main Worker	Marginal Worker	Non-worker
Haroli Tehsil in District Una, HP	14107	71416	36308	35108	8410	13335	2804	52644	27160	17339	9821	44256
Garhshanker Tehsil in District Hoshiarpur, Punjab	70245	330711	168229	162482	34624	136136	0 0	243065	106181	85572	20609	224530

Source: Census 2011

Baseline data refers to basic information collected before a project/scheme is implemented. It is used later to provide a comparison for assessing actual impact of the project. The present report is provided with the following base line data for the study area as a whole. **Table no. 3.2** presents the demographic profile of the villages falling under the state boundary of Himachal Pradesh, District Una in Haroli Tehsil.

TABLE 3-27: Demographic and occupational profile of the Study area within 10 km radius from the project site in Himachal Pradesh

Sr. No.	Name of the Villages	No_HH	TOT_P	TOT_M	TOT_F	P_06	P_SC	P_ST	P_LIT	TOT_WORK_P	MAIN WORK_P	MARG WORK_P	NON_WORK_P
1	Badehra (199)	967	5000	2470	2530	615	935	10	3764	2275	1512	763	2725
2	Kangar (462)	463	2282	1157	1125	241	335	0	1754	953	506	447	1329

3	Dharampur (463)	464	2311	1150	1161	300	431	0	1666	916	681	235	1395
4	Saihnsowal (464)	273	1425	724	701	199	453	0	1084	656	409	247	769
5	Samnal (466)	217	1098	525	573	123	435	1	784	505	194	311	593
6	Rora Baliwal (465)	310	1502	783	719	164	326	0	1069	777	416	361	725
7	Rora	227	1254	639	615	149	57	0	943	576	310	266	678
8	Panjuana	112	600	318	282	59	0	0	442	338	57	281	262
9	Haroli (467)	307	1537	773	764	174	433	15	1206	778	515	263	759
10	Haroli - Ist	171	856	430	426	97	110	0	600	478	313	165	378
11	Haroli - IInd	227	1267	649	618	139	77	0	980	545	474	71	722
12	Palakwah (469)	401	1854	914	940	235	483	2	1408	545	471	74	1309
13	Kante	156	740	354	386	75	21	0	551	312	291	21	428
14	Thakaran	78	353	179	174	31	1	0	243	182	170	12	171
15	Karampur	189	1011	524	487	103	55	0	770	426	165	261	585
16	Palakwah	212	1121	574	547	138	3	0	790	651	427	224	470

	Nichala												
17	Ojale	32	165	95	70	17	8	0	112	98	66	32	67
18	Haleran	162	732	356	376	76	41	0	492	494	353	141	238
19	Jorian	46	243	134	109	26	243	0	172	143	106	37	100
20	Kutharbeet (524)	294	1420	708	712	168	474	0	1068	676	333	343	744
21	Jorian	33	183	102	81	25	170	0	128	58	26	32	125
22	Makor Ghar	79	392	196	196	44	0	0	291	137	38	99	255
23	Janani	45	274	135	139	42	212	28	175	72	65	7	202
24	Dulehar (526)	359	1780	906	874	204	80	83	1386	583	410	173	1197
25	Goindpur Tarf Bula (529)	248	1273	652	621	131	216	0	992	492	324	168	781
26	Kungrat (527)	182	808	401	407	90	508	0	639	218	147	71	590
27	Chhetaran	336	1837	913	924	217	249	0	1365	545	454	91	1292
28	Hiran	143	803	415	388	107	17	0	573	234	135	99	569
29	Chandpur	195	966	495	471	103	10	0	784	303	139	164	663
30	Lalehri (470)	816	4242	2158	2084	485	545	12	3240	1668	708	960	2574
31	Nangal Khur	270	1498	760	738	188	304	0	1131	467	276	191	1031

	d (471)												
32	Manuwal	170	901	458	443	87	106	0	746	292	266	26	609
33	Nangal Kalan (472)	217	1169	608	561	139	106	0	877	363	352	11	806
Total Villages = 33		**8401**	**42897**	**21655**	**21242**	**4991**	**7444**	**151**	**32225**	**17756**	**11109**	**6647**	**25141**

Source: Census 2011

The total household in these 33 villages is 8401 and the total population is 42897. The male population is 50.48% and female population is 49.51%. Population of children below six years is 11.63%. Literacy rate is around 75.12% which is considerably lower than the overall state figure (82.80). The SC population is 17.35% and ST population is only 0.35% in these villages. Among 33 villages only 67 villages found ST community rest 26 villages did not have any ST Population. Sex ratio in 33 villages of the study area in Himachal Region is 980. So far working population is concerned 41.39% population are considered as main worker 25.89% whereas 15.49% are considered marginal worker and non-workers are concerned 58.60% within study area. These 42 villages are found in tehsils Haroli of the District Una.

Table no. 3.27 presents the demographic profile of the villages falling under the state boundary of Punjab, District Hoshiarpur, Tehsil Garhshanker.

TABLE 3-28: Demographic and occupational profile of the Study area 'within 10 km radius from the project site in Punjab

Sr. No.	**Name of the Villages**	**No_HH**	**TOT_P**	**TOT_M**	**TOT_F**	**P_06**	**P_SC**	**P_ST**	**P_LIT**	**TOT_WORK_P**	**MAINWORK_P**	**MARGWORK_P**	**NON_WORK_P**
1	Maili (333)	509	2383	1216	1167	273	460	0	1689	800	713	87	1583
2	Lalwan (339)	270	1341	708	633	148	719	0	957	453	369	84	888
3	Kothi (335)	69	350	179	171	40	260	0	260	134	103	31	216

4	Kanger (334)	76	394	198	196	38	276	0	255	150	106	44	244
5	Fatehpur (337)	153	797	429	368	97	110	0	554	288	223	65	509
6	Ganguwal (338)	28	135	72	63	18	15	0	92	49	49	0	86
7	Chak Nariall (336)	127	621	328	293	73	198	0	449	188	182	6	433
8	Jhanjowal (299)	159	719	380	339	65	386	0	572	263	248	15	456
9	Haluwal (301)	225	1152	582	570	104	672	0	935	348	314	34	804
10	Rampur (318)	312	1410	718	692	150	290	0	1032	468	374	94	942
11	Mehmadwal (320)	298	1351	710	641	135	453	0	985	491	399	92	860
12	Mugowal (297)	457	2186	1089	1097	204	915	0	1640	688	389	299	1498
13	Jandiala (298)	150	722	368	354	60	174	0	526	238	222	16	484
14	Khanni (340)	210	1013	532	481	133	214	0	692	320	299	21	693
15	Harjiana (341)	127	603	313	290	89	207	0	407	190	186	4	413
16	Jaijon (342)	242	1069	541	528	139	47	0	831	335	325	10	734
19	Chak Natha (343)	44	208	123	85	11	0	0	151	175	115	60	33
20	Badowal (345)	118	554	280	274	60	133	0	359	185	156	29	369

21	Lasara (347)	225	1024	520	504	120	111	0	782	243	76	167	781
22	Mehdud (348)	171	825	429	396	114	481	0	552	302	228	74	523
Total Villages = 22		**4213**	**20065**	**10350**	**9715**	**2218**	**6258**	**0**	**14465**	**6701**	**5391**	**1310**	**13364**

Source: Census 2011

Demographic along with Occupational pattern of the Study area in Punjab Region

There are 22 villages located within 10 Km radius of the project area within the state boundary of Punjab. All these villages are being considered as core & buffer area villages. Socio-economic data of these villages are being compiled based on 2011 census book. Total households in 22 villages Punjab Region are 4213. The total population is 20065, among which 51.58% male and 48.41% female. Population of children below 6 years is 11.05%. Sex ratio in 22 villages of Punjab region is 938%. Literacy rate is 72.09%, a slight lower than the literacy rate of District Hoshiarpur (84.6%) within 10 Km study area in Punjab. Schedule caste Population is 31.18%. It is found by the study there is not any Schedule Tribe population among 22 villages in Punjab region within the periphery of 10km Buffer from the project site. Working population is 33.39%, population are considered as main worker 26.86% whereas 6.52% are considered marginal worker and non-workers are concerned 66.60% within study area.

TABLE 3-29: Demographic as well as occupational profile of the study area within 10 km periphery from the study area in Village Kutharbeet, Tehsil Haroli, District Una, Himachal Pradesh

Number of the Villages	Total Household	Total Population	Male	Female	Population below 6 yrs.	SC Population	ST Population	No of Literate	Total Worker	Main Worker	Marginal Worke	Non-Worker
Sum Total of 33 Villages Himachal Region	8401	42897	21655	21242	4991	7444	151	32225	17756	11109	6647	25141

Sum Total of 22 Villages Punjab Region	4213	20065	10350	9715	2218	6258	0	14465	6701	5391	1310	13364
Sum Total of 55 Villages of Himachal region as well as Punjab Region within 10Km Periphery	**12614**	**62962**	**32005**	**30957**	**7209**	**13702**	**151**	**46690**	**24457**	**16500**	**7957**	**38505**

***Source: - Census 2011**

Table no. 3.28 presents the demographic profile of the 55 villages located within 10 km radius of the project area in district Una, Himachal Pradesh. All these villages are falling within two States, Himachal Pradesh where the project is situated, and another is Punjab state due to interstate boundary. Among 55 villages 33 villages is falling in the Himachal Pradesh & rest 22 villages falling in Punjab State because of interstate boundary.

The total Household in these 55 villages is 12614 and the total population is 62962. The male population is 50.83% and female population is 49.16%. Population of children below six years is 11.44%. Sex ratio of the study area within 10 km periphery that is 33 villages of Himachal Pradesh including 22 villages of Punjab state. Sex ratio in 55 villages of 10 km study area is 967. Literacy rate is around 74.15% which is considerably lower than the overall state figure that is 83.78%. The SC population is 21.76%. The ST population is 0.23% which is negligible. ST community was found only in Himachal region not in Punjab region. Total working population is concerned 38.84%. Populations considered as main worker are 26.20% and Non workers are 61.15% whereas marginal worker considered 12.63% within study area.

Social Composition

From the baseline data it is found that the population of Una district is predominantly Hindus and next come Sikhs and third being the Mohammedans. The majority of the population in these villages follows the Hindu religion with a sizable portion of Sikh. There is a sprinkling of Jains and Christians in the district.

Hindi is the most widely spoken language with Pahari and Punjabi.

Culture

The culture of Una we will find a mix of people, both from their roots in Punjab and Himachal Pradesh along with s Hindu deities (devtas), Sikh Worship Gurus and various customs and rituals are observed by the people. Hindi remains the most commonly spoken language in this region; Pahari and Punjabi also have definite prominence. The Navaratra fairs especially Shravani Navartras is very popular among the devotees of goddess. Devotees from all walks of life have been visiting to this place for centuries to seek blessings from the goddess Chhinnmastika. A number of fairs and festivals are celebrated in Una i.e., Hola Mohalla fair, Chintpurni fair, Sawan Ashtami Fair, Paanch Bhisham fair, Piplu fair, Baisakhi festival, Prakash Utsav.

Employment

The project would be promoting employment and ancillary business opportunities and improving the standard of living of locals. Most of the villagers in this region are engaged in agricultural activities as well as industrial activities. The mining operations will provide employment in the form of Skilled, Semiskilled, and unskilled workers. Peoples are engaged in extraction of Sand, Stone & Bajri, loading of material into tractors, trolleys, and tipper trucks. Stone will be transported to the stone crusher and after that it will be transported to market for sale along with Sand and Bajri. Moreover, the construction industry using the raw material from the mine will generate employment for 30 numbers of people for various activities. Thus, the production of construction aggregates, such materials have a tremendous impact on multiple generations of employment in downstream activities.

Economy

The local economy is mainly based on Agriculture, Horticulture and, mainly orchards. Maize and wheat are the major cereal crops. Most of the lands in the district are used for agricultural purposes.. Manufactures include paints and varnishes, plastic bags, resin, and turpentine.

In recent years there has been growth in various light industries including pharmaceuticals and textile manufacturing in Una. This has been mainly because of the town's location and proximity to other state borders. The state government has also provided subsidies on taxes to entrepreneurs and an industrialist to set up their operations in the town. The district has mineral resources such as sand, stone and bajri and available in plenty in various river/stream beds.

Una district is well developed in the industrial sector due to close proximity to Punjab. Mehatpur, Gagret, Tahliwal & Amb are main industrial centres of Una.

Rail & Road Connectivity

Una is the nearby town around 12.20 Km away from the mine site which is well connected with road & railway. ***The Nearest Railway Station:-*** Jaijon Doaba Railway Station: about 6.3 km in the SW direction (Aerial Distance). ***The Nearest Airport:-*** Ludhiana Airport in SSW at 63.5 km (Aerial Distance). ***The Nearest Highway:-*** National Highway NH- NH-503 (Chandigarh-Chintpurni- Dharamshala Marg)- About 15.00 km in East direction.

Basic Amenities

- **Educational**

  The Una has facilities of all levels of schools and colleges and educational institutes which is approx 12.20 km from the project site at village Kutharbeet, District Una, Himachal Pradesh. The nearest school from the project site is Govt. Primary School Una at the distance of 0.95 km (Arial distance), Govt High School Panjuana at the distance of 3.78 km (Arial distance), from the project site, Govt. College Haroli is approx. at a distance of 6.24 km (Arial distance).

- **Medical**

  The Una has facilities of Nursing Homes, Charitable Hospitals, Health Centers, and Civil Hospitals besides many private clinics which is about 12.20 km from the project site, Civil Hospital Haroli Una is situated at the 6.38 Km from the project site.

- **Electricity**

  Electricity for all purpose is available in all village of study area.

- **Housing and Drinking water**

  A major part of the houses in the study area are pucca houses. All villages in the study area have water supply for domestic purposes. The sources of water supply in most of the villages are through pipelines however people have preference for ground water. The water source in these areas is through the Himachal Pradesh Jal Shakti Vibhag Scheme connection and private bore wells.

- **Transport**

  The main mode of transportation is by road. A network of both paved (Pucca) and unpaved (Kucha) roads exist in the study area, both are suitably interconnected. Private vehicles like rented Cars, Taxis and services share the major responsibility of the transport in the study area. Numbers of buses, private and State Government are operating public transport like Himachal Road Transport Corporation (HRTC) on state highways. NH-503 (Chandigarh-Chintpurni-Dharamshala Marg) is at a distance of 15.00 Km from the mine site. The existing local transport facility appears to be sufficient.

- **Post and Telegraph**

  The Post office facility, telegraph office and telephone office and telephone, FAX, STD, ISD etc. are located in nearest villages. The study area is connected through a mobile network. The Una town with all modern facilities is at distance of 12.20 Km (approx) from the project site.

- **Place of Historical or Archaeological Interest**

  There is no place of Historical or Archaeological importance near the proposed project area. But the Una town is about 12.20 km away from the project site which contains Historical or Archaeological importance. The temple of Chintpurni is a prominent pilgrimage center and one of the Shaktipeethas of the country. The temple is situated at the height of 940 metres above the mean sea level on one of the highest peaks of the Sola Singhi range of hills. It is believed that one Pandit Mai Das, a Sarawat Brahmin, has established this shrine of Mata Chintpurni Devi in Chhaproh Village and over a period of time this place came into prominence and became known

as Chintpurni temple after the eponymous name of the deity. District Una is surrounded by the western Himalaya in the north and smaller Shivalik range bordering the state of Punjab in the east.

Impact Assessment & Conclusion:-

For continuous growth and development assessing a positive impact is required to reduce all negative impacts. In this project also there are many positive impacts as well as negative. Considering the positive impact, it has been shown that the project has provided a direct job opportunity to the local persons as both technical and non-technical workers. Literacy has further increased because of better income and awareness amongst the people. The project has provided direct employment opportunities to local people. Indirect employment is being generated in trade and other ancillary services. Employment in these sectors is both permanent and temporary or contractual and involves unskilled labour. A major part of this labour force is mainly from local villagers who are expected to engage themselves both in agriculture and project activities. This enhances their income and leads to overall economic growth of the area. The following socio-economic changes are expected due to activities:

- Approximately 30 local people shall be directly benefited by this project.
- The employment shall be in the form of skilled as well as unskilled workers.
- The project is having a positive impact on income through a multiplier effect.
- Expected Improvement of infrastructure & transportation.
- The project has brought about changes in the pattern of demand from food to non-food items as sufficient income is being generated.
- The employment shall be in the form of skilled, semi-skilled as well as unskilled workers.
- People located in the project area and in close vicinity, enjoying positive changes in lifestyle and better quality of life.
- The proposed project will be helping to produce the construction materials as per market demand to perform various activities. Because Sand, Stone & Bajri are economically important resources for construction purpose.

Rehabilitation &Resettlement (R&R) Action Plan

There shall not be any displacement of people due to project; hence no R &R Action plan is required. There is no Land Acquisition.

****

4. ANTICIPATED IDENTIFICATION OF IMPACTS AND MITIGATION MEASURES

4.1 INTRODUCTION

Identification of all potential environmental impacts due to project is an essential step of Environmental Impact Assessment. In case of mining projects, impacts on biodiversity, air pollution, water pollution, waste management and social issues are significant. Both direct and indirect environmental impacts will be created on various environmental attributes due to proposed mining activity in the surrounding environment, during the operational phase. The occurrence of stone, boulder, bajri & sand (minor mineral) deposits, being site specific, their exploitation often does not allow for any choice except adoption of eco-friendly operation. Positive impacts on socio-economic environment are expected due to creation of employment opportunities. Mining activities are normally carried out over a long period which also encourages development in the area such as roads, schools, hospitals etc. Several scientific techniques and methodologies are available to predict impacts of physical environment. Mathematical models are the best tools to quantitatively describe the cause-and-effect relationships between sources of pollution and different components of environment. In cases where it is not possible to identify and validate a model for a situation, predictions have been arrived at based on logical reasoning/consultation/extrapolation.

4.2 LAND ENVIRONMENT

The lease area is situated at Khasra No. 1165, 1166, 1169, 1173, 1174,1196,1197,1198,1200, 1206,1206/1,1226,1227 Mauza/Mohal Kuthar beet Tehsil Haroli, District Una Himachal Pradesh. Various components of land environment have been identified for study of impact of the mine operations. Details of the same are given below:

Anticipated Impacts:

- The top soil from the working benches will be removed by means of an excavator and stacked separately used for backfilling from first year onwards.
- The Interburden is low grade magnesite and shall be removed manual means and to be dumped separately and used for backfilling from first year onwards.
- The top soil and Interburden material will be dumped separately on mineralized land, but these dumps are temporary in nature and it will be used in reclamation purpose.

Mitigation measures:

- Mineral will be mined out leaving sufficient no mining zone of 1/10th of the total width of the mining lease area from both sides and also leaving a safety zone 5 meters.
- Grasses and bushes which have fibrous roots at the first instance are proposed to grown along the mining lease which enhances the binding properties of the soil. Hence protecting the soil erosion.
- In this activity, the work is proposed to be done manually as well as semi machanized which will avoid adverse effects associated with heavy machinery and their functioning.
- The mining is planned in non-monsoon seasons only.
- The backfilled area shall be leveled and it is use for agriculture purposes in future.

4.3 WATER ENVIRONMENT

Anticipated Impacts:

- Mining activity may intersect groundwater level.
- Wastewater generated from the mining activity will cause water pollution.
- Domestic wastewater generated from temporary toilets may cause contamination in water.

Mitigation measures

Restriction in excavation depth will be made compulsory to avoid reduction in the thickness of the natural filter materials. Which is 1meter as per state mining policy.

- Mining in the area will be done well above the water table.
- No wastewater will be generated from the mining activity of stone, boulder, bajri & sand (minor minerals) as the project only involves their extraction from Hill slope.
- The domestic wastewater generated from temporary toilets used by the work force will be treated in septic tank followed by soak pit.

The deposit will be worked from the top surface up to a maximum depth of 1m below ground level or above the ground water table whichever comes first. Hence mining will not affect the ground water regime as well. Further mining will be completely stopped during the monsoon seasons.

4.4 AIR ENVIRONMENT

Anticipated Impacts:

Emission of fugitive dust is envisaged due to:

i. Mining Activities includes excavation and lifting of minerals. The dust generated from mining processes involving such as drilling, blasting, mechanized loading etc.

ii. Minerals will be transported by trucks through road. Fugitive dust emission is expected from the haul road due to the transportation of trucks.

4.5 AIR MODELING

Introduction – Air Quality Modeling framework

The Gaussian Dispersion Modeling (GDM) is used for prediction of dispersion of air emission and the computation of Ground Level Concentration (GLC) up to a specified distance from source. The fundamental model is given below:

$$c(x,y,z) = \frac{Q}{2\pi\sigma_y\sigma_z u}\exp\left(\frac{-y^2}{2\sigma_y^2}\right)\left(\exp\left(\frac{-(z-h)^2}{2\sigma_z^2}\right)+\exp\left(\frac{-(z+h)^2}{2\sigma_z^2}\right)\right),$$

Q = Pollutant emission rate (g/s)
u = Average wind speed (m/s)

y = y position (m)
z = z position (m)
H = Effective stack height (m)

AERMOD dispersion model with the following options has been used to predict the cumulative ground level concentrations due to the proposed emissions. Area being rural, rural dispersion parameters is considered

- Predictions have been carried out to estimate concentration values over radial distance of 10 km around the sources
- A combination of Cartesian and Polar receptor network has been considered.
- Emission rates from the sources were considered as constant during the entire period
- The ground level concentrations computed were as is basis without any consideration of decay coefficient
- Calm winds recorded during the study period were also taken into consideration
- 24-hour mean meteorological data extracted from the meteorological data collected during the study period as per guidelines of IMD/CPCB has been used to compute the mean ground level concentrations to study the impact on study area.

4.5.1 Meteorological data - Three monthly, Hourly data wind speed, wind direction, calm, atmospheric temperature, etc. In the present study, one season (October to December 2022) meteorological data has been used for modeling purpose. The mixing height for study period and area is built-in the software.

Windrose diagram of one season meteorological data used for modeling is given below as Figure-4.1.

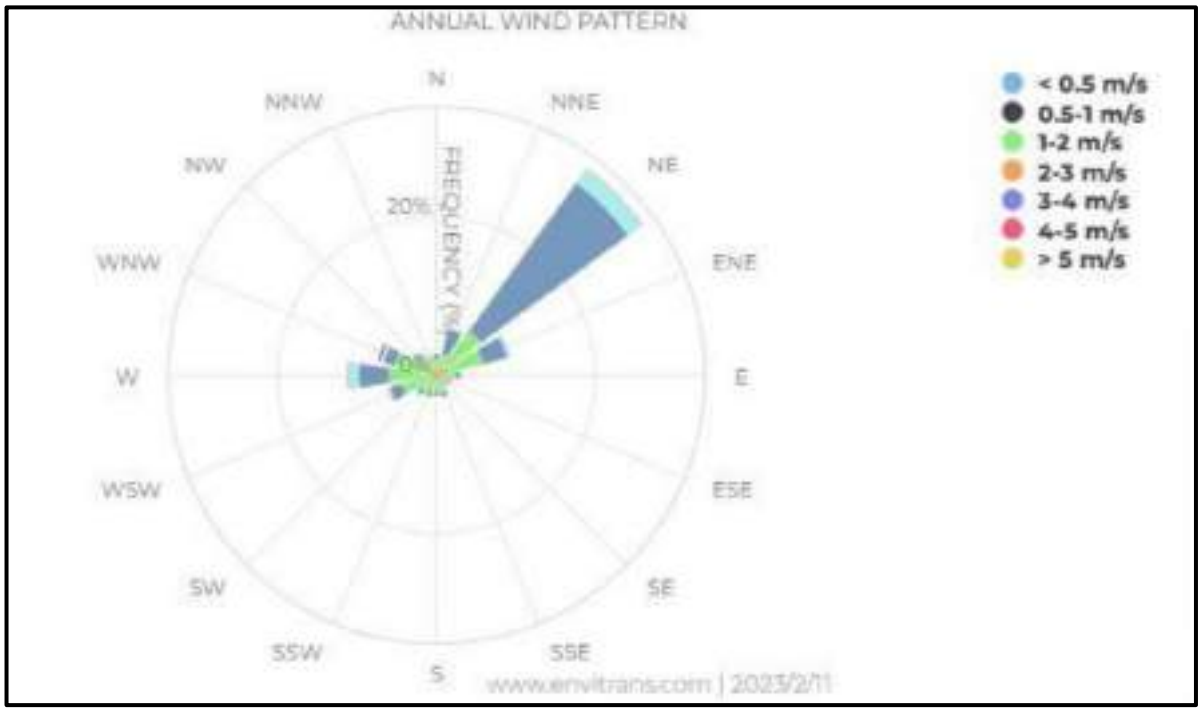


FIGURE 4.1: WIND ROSE PLOT FOR PROPOSED PROJECT AREA

4.5.2 AERMOD VIEW: AERMOD is an air dispersion-modeling package, which seamlessly incorporates the popular USEPA Models, ISCST3, ISC-PRIME and AERMOD into one interface without any modifications to the models. These models are used extensively to assess pollution concentration and deposition from a wide variety of sources.

AERMET: In order to carried out the air dispersion modeling project using the AERMOD, it is necessary to process the meteorological data of study area being modeled. The collected

meteorological data has been pre-processed using AERMET program. The AERMET Program is a meteorological pre-processor, which prepares hourly surface data and upper air data for use in the AERMOD air quality dispersion model.

Parameter	Details
Model name	AERMOD
Version	8.9.0
Model type	Gaussian plume air dispersion model
Averaging time	24 hours
Source type	area source
Boundary limits	10 km
Co-ordinate system	Uniform grid
Surface meteorological data	Site specific data processed by AERMET

Identification of Source:

The emission rates for the different sources in the mining area were calculated primarily based on emission -42 guidelines. Further the emission estimation equations given collated from

conducted in India for the estimation of emission rate of respirable suspended particulate matter from various open cast mining activities. In addition, as the proposed mine development will be undertaken in environmentally friendly manner as per the stipulated guidelines, activity specific control factors are considered in calculation the emission rates.

Emission from the source

Loading of Material

The mineral will be loaded on trucks, the loading activity shall take place during three working shift with effective loading time of 8 hours in each shift. The mineral will be then transferred to beneficiation plant via road. The PM10 emission rate due to loading activity is calculated using below equation.

$$E = k\ X\ 0.0016\ X\ \left(\frac{\left(\frac{U}{2.2}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}\right)$$ --- AP42 (Nov 2006)

Where,

E = Emission Factor, kg/ton

k = Particle size multiplier, 0.35

M = Moisture Content, %

u = Mean wind speed, m/s

Emission of PM10 due to Transportation

The hauling of mineral via haul road (unpaved road) will cause emission of particulate matters. This emission will be limited to the extent of haul road in the area and outside. The particulate matters generated due to transportation on haul road get settled in proximity of the haul road only. Three working shift of 8 hours per day will be used for transportation. The following empirical expressions is used to estimate the quantity in pounds (lb) of size-specific particulate emissions from an unpaved road in industrial sites, per vehicle mile traveled (VMT)

$$E = k\ \left(\frac{s}{12}\right)^{a}\left(\frac{W}{3}\right)^{b} + C$$ --- AP42 (Nov 2006)

Where

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

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

s = surface material silt content (%)

W = mean vehicle weight (tons)

C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear, 0.0047 lb/VMT for PM10.

The source characteristics s, W are referred to as correction parameters for adjusting the emission estimates to local conditions. The effective emission factor after considering reduction in emission potential of haul roads due to water sprinkling was calculated for use in AERMOD model.

Table- 4.1 Emissions Rates for PM_{10}

Activities	Units	Emission Rates
Loading of Material	g/s	0.007714755
Transportation on Haul Road	g/s	0.028

Table-4.2 Emissions Rates for $PM_{2.5}$

Activities	Units	Emission Rates
Loading of Material	g/s	0.000090735
Transportation on Haul Road	g/s	0.00275

4.5.3 Result

Table 4.3– Predicted GLC of PM_{10} at Ambient Air Quality Monitoring Stations

Location Code	Baseline data(µg/m^3)	Incremental GLC due to loading + Transportation(µg/m^3)	Cumulative GLC PM_{10} (µg/m^3)
Project Site (Upside) (AA1)	53.4	0.33856	53.73856
Project Site (Center) (AA2)	52.85	0.65819	53.50819
Project Site (Downside) (AA3)	54.98	0.80311	55.78311
Lakh Data Peer Mandir Panjoiyan (AA4)	45.02	0.38829	45.40829
Govt. Primary School Kuthar Beet (AA5)	47.21	0.29595	47.50595
Gram Panchayat Baliwal (AA6)	52.97	0.07015	53.04015
Govt. School Badhera (AA7)	50.63	0.10027	50.73027

PWD Guest House Haroli (AA8)	52.81	0.10376	52.91376
NAAQS Limit	**100**	**--**	**100**

Table 4.4– Predicted GLC of $PM_{2.5}$ at Ambient Air Quality Monitoring Stations

Location Code	**Baseline data(µg/m^3)**	**Incremental GLC due to loading Transportation(µg/m^3)**	**Cumulative GLC $PM_{2.5}$ (µg/m^3)**
Project Site (Upside) (AA1)	23.84	0.10469	23.94469
Project Site (Center) (AA2)	22.75	0.22928	22.97928
Project Site (Downside) (AA3)	24.9	0.25063	25.15063
Lakh Data Peer Mandir Panjoiyan (AA4)	21.38	0.12710	21.5071
Govt. Primary School Kuthar Beet (AA5)	15.93	0.08062	16.01062
Gram Panchayat Baliwal (AA6)	32.97	0.02383	32.99383
Govt. School Badhera (AA7)	23.47	0.02889	23.49889
PWD Guest House Haroli (AA8)	24.32	0.03032	24.35032
NAAQS Limit	**60**	**--**	**60**

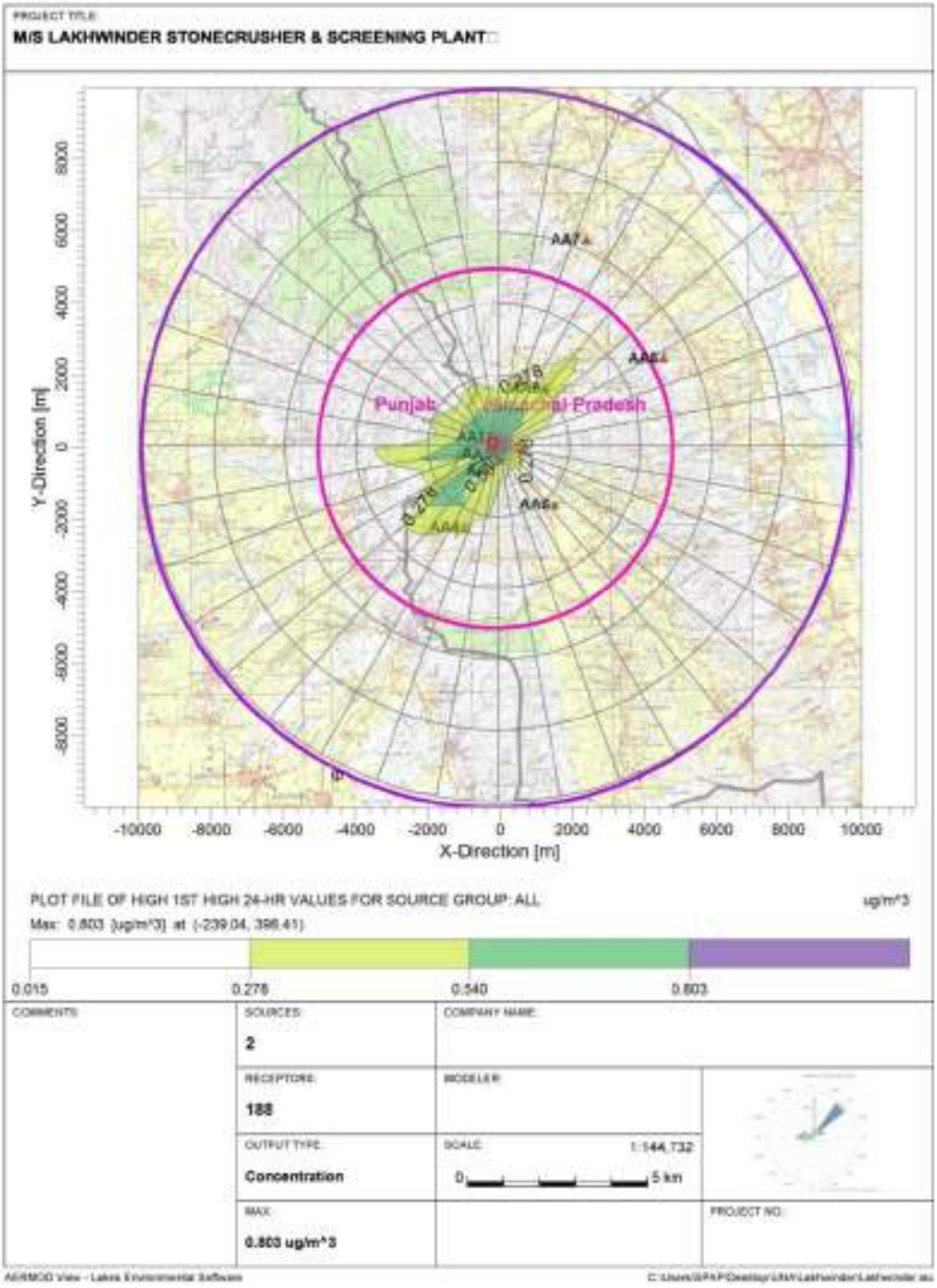


FIGURE 4.2: ISOPLETHS OF SEASONAL AVERAGE INCREMENTAL PM10CONCENTRATIONS

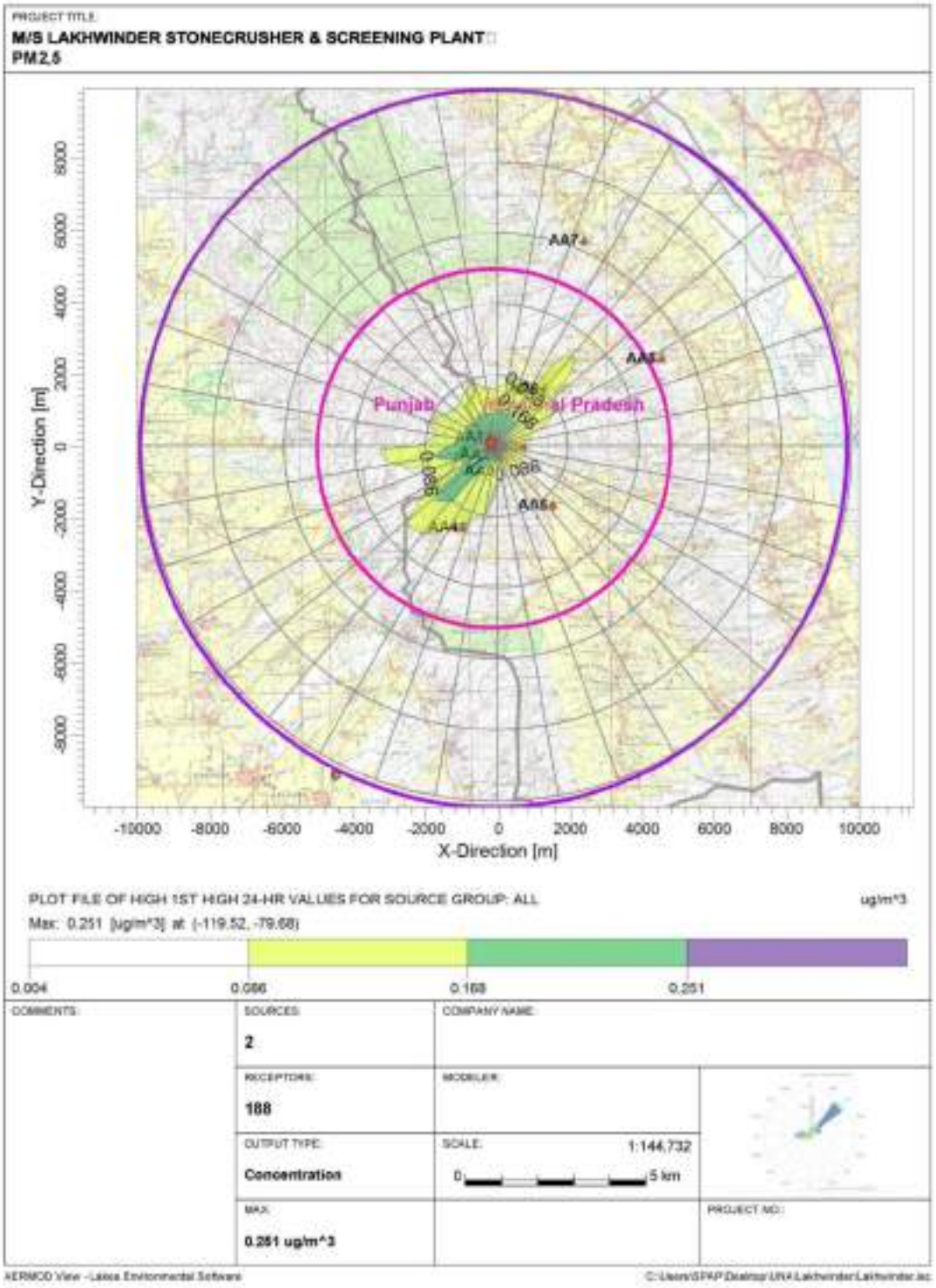


FIGURE 4:3 ISOPLETHS OF SEASONAL AVERAGE INCREMENTAL PM2.5 CONCENTRATIONS

Conclusion

- The predicted concentrations from mining activities are insignificant; whereas transportation is the major of source of dust emission.
- Predicted cumulative concentrations of PM_{10}, and $PM_{2.5}$ are meeting the prescribed NAAQ standards.

Mitigation Measures

The proposed mining operations are anticipated have low impact on the ambient air quality. The following measures are suggested to mitigate any harmful impacts of pollutants -

- Planning multiple transportation routes in different direction to minimize the dust generation.
- Planning paved roads outside mine lease area to minimize the dust generation. Alternatively, planning transportation routes so as to reach the nearest paved roads by shortest route. (minimize transportation over unpaved road);
- Frequent water sprinkling on unpaved roads.
- Plantation of trees along haul roads, especially near settlements, to help to reduce the impact of dust on the nearby villages;
- Dust mask shall be provided to the workers engaged at dust generation points like excavations and loading points;
- Transportation of material shall be carried out during day time only;
- The speed of trucks plying on the haul road should limited to avoid generation of dust;
- Covering of material during transportation on trucks to prevent spillage of sand from the trucks. The trucks shall be covered by tarpaulin. Overloading shall be avoided.

4.6 NOISE ENVIRONMENT

Noise generated at the mine is due to semi-mechanized mining operations and truck transportation activities. The noise generated by the mining activity dissipates within the mine. There is no major impact of the mining activity on the nearby villages. However, pronounced effect of above noise levels is felt only near the active working area. Noise at lower levels (sound pressure) is quite acceptable and does not have any bad effect on human beings, but when it is abnormally high- it incurs some maleficent effects. In this case the impact of noise on the nearby settlements is negligible as they are far located from the mine workings.

The exposures to excessive noise levels can lead to:

- Disturbed sleep, insomnia and fatigue.
- Decrease in speech reception, communication.
- Distraction and diminished concentration thus adversely affecting the performance efficiency.
- Irreparable cardiovascular, respiratory and neuralgic damages in certain extreme cases.

The noise level in the working environment are compared with the standards prescribed by Occupational Safety and Health Administration (OSHA-USA) which has been adopted and enforced by the Govt. of India through model rules framed under Factories Act, 1980 and CPCB 2000 norms. The summary of the permissible exposures in cases of continuous noise as per above rules is given below:

TABLE 4-5 DAMAGE RISK CRITERIA FOR HEARING LOSS OSHA REGULATIONS

Maximum allowable duration per day in hour	Sound pressure db (A)	Remarks
(1)	**(2)**	**(3)**
8.0	90	1. For any period of exposure falling in between any figure and lower figure as indicated in column (1), the permissible sound is to be determined by extrapolation or proportionate scale. 2. No exposure in excess of 115 db (A) is permissible.
6.0	92	
4.0	95	
3.0	97	
2.0	100	
1 1/2	102	
1	105	
3/4	107	
1/2	110	
1/4	115	

Noise at lower levels (sound pressure) is quite acceptable and does not have any bad effect on human beings, but when it is abnormally high- it incurs some maleficent effects.

The area in general represents calm surroundings. There is no heavy traffic, industry or noisy habitation near the proposed leased mining area. As there will be no heavy earth moving machinery there will not be any major impact on noise level due to proposed mining and other associated activities. A detailed noise survey has been carried out and results were cross referenced with standards and were found to be well within limits. Blasting technique shall not be used for lifting of sand and stone, hence no possibility of land vibration. It was found that the proposed mining activity will not have any significant impact on the noise environment of the region. The only impact will be due to transportation of sand and stone by trucks to the stone crushing unit.

The noise levels for different transport equipment in this mine are given in Table:

TABLE 4-6 NOISE GENERATED BY DIFFERENT MACHINERY

S.No.	Equipment	Noise level (dBA)
1.	Tractor trolley	65-75
2.	Trucks	65-80

The movement of trucks and tractor trolley through village road generating noise of 65-80 dBA will result into momentary rise in noise level up to 40-50 dBA at receptor location *i.e.*, habitations in village during daytime. These shall be well within the prescribed standards as shown in the table below.

With the resultant value being less than the prescribed ambient noise levels, there is no likelihood of adverse impact of noise, from the transportation activity, on the surrounding background noise level.

During mining operation *i.e.,* collection of stone and loading into transporting vehicle noise levels shall be higher but well within limit of the noise levels in the working area when compared with standards prescribed by occupational safety and health administration (OSHA-USA) and CPCB New-Delhi.

Mitigation measures

The following measures have been envisaged to reduce the impact from the transportation of minerals:

i. The vehicles will be maintained in good running condition so that noise will be reduced to minimum possible level.
ii. In addition, truck drivers will be instructed to make minimum use of horns in the village area and sensitive zones.
iii. No such machinery is used for mining which will create noise to have ill effects.
iv. Awareness will be imparted to the workers about the permissible noise levels & maximum exposure to those levels.

Biological environment

Present data have been collected through direct inventory as well as various Government Departments such as forests, agriculture, fisheries, animal husbandry and various offices to establish the pre-project biological environmental conditions. There are no endangered species, wildlife sanctuary, wildlife corridors, faunal migratory routes or eco-sensitive area near the whole study area. For this, mine owner planted a good roadside plantation along both side of the mine road.

Impacts on agriculture

The area around the mine lease area is all barren and no agriculture activity is going on atleast 5 km away from the mine site. Therefore, no significant impact on the agriculture around the project site is expected.

Impacts on aquatic ecology

Mining activities may result in affecting the riverine ecology by polluting the river water. But in this case, river lies almost 3.0 km away from mine site and also nothing is being discharged into the river.

However, indiscriminate fishing by labourers etc. may reduce fish stock availability for commercial and sport fishermen. Thus, it is recommended that adequate surveillance measures are implemented during project operation phase to ameliorate such impacts.

Mitigation Measures

There is a requirement to establish a stable ecosystem with both ecological and economic returns. Minimization of soil erosion and dust pollution enhances the aesthetic value of the core and the buffer zone. To achieve this, it is planned to increase the area of green cover of plantation and green belts activities. The basic objectives of plantations are as follows:

- Improvement of Soil quality,
- Quick vegetative cover to check soil erosion,
- Improvement in mining site stability,

- Conservation of biological diversity of plants, birds and animals,
- As dust receptor and dust filter, this is likely to be produced during mining.

4.7 SOLID& HAZARDOUS WASTE :

During mining as such no solid & hazardous waste will be generated. Nominal amount of domestic waste will be generated at the mine site by the workers which will be disposed-off by municipal way. Topsoil and Mine waste will be generated during the mining of sand, stone & bajri which will be further use for back-filling purpose and also plantation purpose along the road-sides & crusher site

4.8 TRAFFIC ANALYSIS

Transportation Route:

The excavated minerals will be loaded directly into trucks and transported to the concerned market/end users. For the transportation of minerals one evacuation routes has been proposed, distributing the traffic load to reduce the traffic congestion. Evacuation Route: The mine lease area is connected to the nearest metaled road by a kuccha road via village to the crusher site, from where material will be transported to the market/end users.

Traffic Management:

1. Roads will be repaired regularly and maintained in good conditions.
2. Regular sprinkling of water to control the dust emission
3. Traffic movement will be regulated near the site.
4. Speed breakers will be constructed accident prone areas to calm the traffic and its speed.
5. Signage will be erected at the sensitive & precarious places to caution or provide information to road user.

4.9 SOCIO-ECONOMIC ENVIRONMENT

Human settlement

The villages and their inhabitants in the buffer zone will not be disturbed from their settlements due to the mining operations.

There is no inhabitation within the lease area. Therefore, neither villages nor any part of village or any hamlet will be disturbed during the entire life of the mine. As the mining operations will not disturb or relocate any village or settlement, no adverse impact is anticipated on any human settlement.

Sensitive targets

There are no places of Tourist, religious & historical importance in core zone.

Socio economic status

There are some people who are engaged in trading of stone, boulder, bajri and sand. Therefore, due to mining of these minerals the per capita income of local people has been improved.

The job/ business opportunities have improved the economic condition of the people. They are in a position to utilize this money for purchase of tractors, trucks, jeeps, etc. which may be put into use for business purposes. Part of money has also been utilized in starting of some business as per

The results of the field survey conducted based on a questionnaire prepared to understand the knowledge and perception of the people living around the project area, gives a clear idea about the

need for the project. The awareness level regarding the proposed mining activity is very high. The proposed mining activity is expected to provide stimulus to socio-economic activities in the region and thereby accelerate further development processes. However, there is an apprehension that local people may get engaged in illegal activities if they are not involved in the proposed mining operation or the project is shelved.

4.10 Rain Water Harvesting

Rain water harvesting pits will be constructed to recharge the rain water to the ground with consultation of Panchayat.

CONCLUSION

All possible environment aspects have been adequately assessed and necessary control measures have been formulated to meet statutory requirements. Thus, implementing this project will not have any appreciable negative impacts.

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5. ANALYSES OF ALTERNATIVES (TECHNOLOGY & SITE)

5.1 GENERAL

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

5.2 ALTERNATIVE FOR MINE LEASE

Site: Mining is site specific project and guided by deposit geology; hence alternative site is not applicable

Mining Technology

Mining will be opencast manual as well as Semi Machanized only. Mining will do to collect sand, stone & *bajri* from the riverbed and to land it in tippers/tractor trolley. Maximum depth of working will be restricted to 1m. Haulage roads will be maintained Properly. Drilling and blasting is not proposed. The site selected has following advantages:

- The project site is a Non-Forest Agriculture land.
- There are many other mines in the study area, however, basic infrastructure such as road and electric connection are available.
- Better availability of experienced labors from nearby villages.
- No endangered species around the mine site.
- The mining project site is mineral specific.

Working Depth

The ultimate depth of the open cast pits will be 1m below ground level. The mining shall be done as per lay down procedure and given in mining plan.

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6. ENVIRONMENTAL MONITORING PROGRAMME

6.1 GENERAL

The monitoring and evaluation of environmental parameters indicates potential changes occurring in the environment, which paves way for implementation of rectifying measures wherever required to maintain the status of the natural environment. Evaluation is also a very effective tool to judge the effectiveness or deficiency of the measures adopted and provides insight for future corrections.

The main objective of environmental monitoring is to ensure that the obtaining results in respect of environmental attributes and prevailing conditions during construction and operation stage are in conformity with the prediction during the planning stage. In case of substantial deviation from the earlier prediction of results to identify the cause and suggest remedial measures. Environmental monitoring is also mandatory to meet compliance of statutory provisions under the Environment (Protection) Rules, 1986, relevant conditions regarding monitoring covered under EC orders issued by the SEIAA as well as the conditions set forth under the order issued by State Pollution Control Board while granting CTE/CTO.

6.2 AREAS OF CONCERN

In case of mining projects, the changes relating to water, aquatic biota, air, noise, biodiversity of the area, stability of pit slopes, river hydraulics and plantation programme need special attention, from monitoring point of view, during the conceptual mine plan period to judge the efficiency of measures implemented for conservation of environment.

6.3 ENVIRONMENTAL MONITORING PROGRAMME

All the environmental parameters viz. air, water, noise, soil will be monitored regularly in order to detect any changes from the baseline status. Environmental Monitoring program will be followed till the mining operations ceases.

6.3.1 Air Quality Monitoring:

Air Quality monitoring is essential for evaluation of the effectiveness of abatement programmes and to develop appropriate control measures. The project proponent will monitor ambient air quality in and around the proposed ordinary sand mining projects at a frequency of once in a fortnight or any other frequency as stipulated by MoEF and take appropriate air pollution control measures in order to ensure that the concentration of PM2.5, PM10, SO2 and NOX are within limits.

6.3.2 Water Quality monitoring

Water quality monitoring involves periodical assessment of quality of surface water and the ground water near the mine site. Surface water samples will be analyzed for all the parameters as per EPA, 1986 ground water samples will be analyzed for all the parameters as per IS-10500.

Phreatic surface levels will be monitored throughout the life of the project to study the impact of mining operations on ground water regime. A network of observation wells will be located in the villages around the projects area for monitoring of phreatic surface levels. The water levels will be monitored during pre-monsoon and post-monsoon seasons four times in a year.

6.3.3 Noise level monitoring

Noise level monitoring will be done for achieving the following objectives:

a) To compare sound levels with the values specified in noise regulations

b) To determine the need and extent of noises control of various noise generating sources
c) Correlation of noise levels with community response to noise levels.

Noise level monitoring will be done at the work zone to assess the occupational noise exposure levels. Noise levels will also be monitored at the noise generating sources like mineral handling arrangements, vehicle movements and also nearby villages for studying the impact due to higher noise levels for taking necessary control measures at the source.

TABLE 6-1 MONITORING SCHEDULE AND PARAMETERS

S.No.	Aspect	Parameters to be monitored	Frequency
1	Air Quality monitoring	PM10, PM2.5, SO2, NO2, Free Silica	As per CPCB/ SPCB requirement on monthly basis.
2	Noise Quality monitoring	Leq for day and night	As per SPCB/MoEF & CC requirements of compliance
3	Water Quality Monitoring	Comprehensive monitoringas per IS:10500 Groundwater level (mbgl) and Surfacewater quality as per IS 2296:1991	Periodic during operation phase as per SPCB/ CPCB guidelines
4	Soil	Organic matter, Texture, pH, EC, Permeability, Water holding capacity, porosity etc	Periodic during operation phase as per SPCB/ CPCB guidelines
5	Plantation	Plantsand shrubs in the Green belt area and their mortality status	Periodic during operation phase as per SPCB/CPCB compliance requirements

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7 ADDITIONAL STUDIES

7.1 GENERAL

All types of industries face certain types of hazards like failure of machinery, explosion etc. and disasters like fires, inundation, earthquake etc. which can disrupt normal activities abruptly. Mining and allied activities are associated with several potential hazards to both the employeesand the public at large. Therefore, it is necessary to consider specific issues as applicable to individual projects to take precautions against these issues. A worker in a mine should be ableto work under condition, which are adequately safe and healthy. At the same time the environmental conditions should be such issues.

7.2 PUBLIC CONSULTATION

In compliance to provision of the EIA notification dated 14.9.2006. Draft EIA report is submitted to Himachal Pradesh State Pollution Control Board Committee for conducting Public Hearing. After conduction of Public Hearing, proceeding along with action plan will be incorporated in Final EIA Report.

7.3 IDENTIFICATION OF RISK & HAZARDS

The mining of stone, boulder, bajri and sand will be done manually as well as semi-mechanically so, there will not be any major risk hazard associated with the process. The possible scenarios selected for this project are as below:

- Accident during sand loading, transporting and dumping
- Accident due to vehicular movement
- Occupational injuries
- Possibility of earthquake
- Fires on large surface vehicles through ignition of fuel/Hydraulic fluids

7.3.1 Accident due to vehicular movement

The consequences of this scenario are moderate and may result in hospitalization andday loss.
The likelihood of occurrence is occasionally possible.

7.4 RECOMMENDATION FOR RISK

7.4.1 REDUCTION MEASURES TO PREVENT INUNDATION/FLOODING

- Formation of deep pits should not be allowed.
- Check dams will be constructed & maintained.

7.4.2 Measures to Prevent Accidents during Loading

The truck should be brought to a lower level so that the loading operation suits to the ergonomic condition of the workers.
The loading should be done from one side of the trucker trolley only.
The workers should be provided with gloves and safety shoes during loading.
Operations during daylight (9a.m. to 6 p.m.) only.
Stockpiling of harvested material on the river bank should be avoided.
Necessary first aid kit will be always kept in the mine site.

7.4.3 Measures to Prevent Accidents during Transportation

Vehicles must be periodically checked and maintained in good condition and must not be overloaded

Overloading should not be permitted.

To avoid danger of accident roads and ramp near embankment should be properly maintained.

The truck should be covered and maintained to prevent any spillage.

The maximum permissible speed limit should be ensured.

The truck drivers should have proper driving license.

7.4.4 Preventive and Corrective Measures for Occupational Injuries

- Training will be given to the workers on how to use hand equipment.
- First aid will be provided on-site only if any accident occurs.
- In-case of poor condition of any equipment, it will be changed immediately.

7.4.5 Preventive and Corrective Measures for Fires on large surface vehicles through ignition of fuel/hydraulic fluids

- Availability of fire extinguishers on-site throughout the operational phase of mine
- Maintenance of vehicles on monthly bases.

7.5 SOCIAL IMPACT ASSESSMENT

Socio-Economic Impact Assessment (SEIA) refers to systematic analysis of various social and economic characteristics of human being living in a given geographical area during a given period. The study area consists of core area where the project is located and a buffer area encircling the project area with a radius of 10 kilometers from the periphery of the core area.The Socio-economic Impact Assessment focuses the effect of the project on social and economic well-being of the community. The impact may be direct or indirect. Further, the impact may bepositive or negative.

Objectives of SEIA

The prime objective of the current study is to assess the impact of the proposed Mining Projecton socio-economic characteristics of people living in the neighborhoods. Further, it is to be established whether the impending impact would be direct or indirect. Furthermore, it is to be examined whether the said impact would be positive or negative.

Scope

The Scope of the study is as follows:

- To collect baseline data of the study area
- To comprehend socio-economic status of the people living in the study area.
- To assess probable impact of the project on social and economic aspects 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 impact.
- To suggest mitigation measures and agency responsible for taking action in case of adverse impact.

7.6 SOCIO-ECONOMIC IMPACT OF THE PROJECT

Impact on demographic composition

The proposed Mining Project at Mauza & Mohal Kuthar Beet in Tehsil Haroli,District Una, Himachal Pradesh will hardly make any difference in the demographic composition of the study area as the additional employment it envisages to create will be metlocally to the maximum extent. Hence, the chances of in-migration of people from outside the study area are remote. Accordingly, there will be no variation in the total population of thestudy area including that of sex ratio, when the mine starts operating.

Employment Opportunities

The proposed Project will provide employment to the local people. The number of workers to be deployed in the mining project will depend upon the quantity of minerals to be extracted from the mine by the lease holder. Both the miners and the unskilled workers willbe recruited locally. It has estimated that 30 people will get direct employment in this mining project. It is a positive impact of the project since it is providing employment opportunitiesto the local people. The project will not affect the vulnerable groups of people.

Increased supply of minerals in the market

Both Government departments and private developers have taken up construction of roads, bridges and buildings in a big way. Hence, the demand for stone, boulder, bajri &sand is ever increasing with the growth of the infrastructure development in our country. The requirement for the building materials is always high, there is already an acute shortage of sand in the market, and the construction industry is the main sufferer. It is a critical component of concrete mixture. It is also used forfiltering waste. With the commencement of the proposed mining project the supply of stone,boulder, bajri & sand will increase at least in the local market.

Impact on road development

Movement of trucks and other vehicles to and from the mining site is expected to increase when mining will start. The existing roads connecting the quarry with the national highways are connected by metaled and unmetalled roads. Hence, there is need for road maintenance and repairing regularly in the mining area. Further, there are risks of accidents during loading of extracted minerals into tractors-trolleys and transportation to markets for sells. However, accidents can be avoided by taking due care and precautions.

Impact on health

There are no chances of occurring diseases, due to manual mining of sand. Sand is nontoxic. However, sand-using activities such as sand blasting require precautions since it create respiratory problems among mine workers. Excessive inhalation of sand is a serious health concern. To avoid respiratory problem from sand necessary protection should be taken.

Few safety measures are outlined below:

a) It is ensured that health and safety of all the employees at work will provide. Efforts will be made to provide and maintain a safe work environment and ensure that the machineryand equipment in use is safe for employees. Further, it will be ensured that working arrangements are not hazardous to employees.

b) The first aid treatment reflects the hazards associated with the mining of stone, boulder,bajri

& sand. The first-aiders will be well trained in handling patients working in the above Mining Project.

c) For all mine workers regular health examination will be made compulsory. Treatment for respiratory diseases or asthma, skin diseases, lung function test (pre and post Ventolin), Audiograms, Chest X- ray etc., as required will be given.

d) To meet the medical needs of the mine workers tie-up with nearest hospitals will be made.This will ensure timely medical aid to the affected persons.

E) For protection from dust it will be made compulsories for all workers to wear masks and gloves, while working in the mine.

7.7 CONCLUSION

The Mining of stone, boulder, bajri & sand in Mauza & Mohal Kuthar beet in Tehsil Haroli, District Una, Himachal Pradesh will provide employment to local people who are in search of the same. The granting of Environment Clearance to the project will make mining of stone, boulder, bajri & sand, legally valid and it will generate revenue for the state. With the implementation of the project there will be increase in the employment opportunities for the local villagers. The study area is still lacking in health and educational facilities. It is expected that same will improve to a great extent with opening of the project and associated activities. Also, Proposed CER activity will improve the socio-economic statusof the villagers of the study area.

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8 PROJECT BENEFITS

8.1 BENEFIT OF MINING

The proposed project is mining of stone, boulder, bajri and sand from the hill slope, which has no major impact on surrounding environment. The proposed activity shall provide raw material to Stone crusher there by boosting production of construction material. This will bring overall improvement in infrastructure development and economic growth of the area.

- Generating useful economic resource for construction.
- Generating employment and improvement of socio-economic conditions of the study area.

8.2 EMPLOYMENT POTENTIAL

The socio-economic conditions of the surrounding villages indicate that employment generation is seasonally. The occupational activities are agriculture and cattle rearing. The mining activity will provide employment to local people which will increase socioeconomic status of the area. Sand is the main raw material for making roads & filling material. The mining activity will provide direct employment to 30 skilled local people and indirect employment of semi-skilled and unskilled workers engaged in transportation, trading and other allied activities, which will improve socio- economic status of the area.

8.3 IMPROVEMENTS IN THE PHYSICAL INFRASTRUCTURE

The proposed stone, boulder, bajri and sand mine will have numerous induced impacts on society such as growth in schools, hospitals, hotels & resorts, transport etc. It will also attract other entrepreneur to establish their venture in the region.

8.4 IMPROVEMENTS IN THE SOCIAL INFRASTRUCTURE

The social infrastructure like religious places (Temple, Mosque, Church, Gurudwara); marriage homes, Bus stations, railway stations, play grounds will be improved.

8.5 OTHER TANGIBLE BENEFITS

Stone, Boulder, Bajri and Sand mining has become a widely spread activity and does not require a huge set up or technology, the number of ventures has increased extensively, and it has become a footloose industry in itself, but the backward-forward linkages are becoming stronger as many are getting employed as well as the construction activity / industry requires this mineral at consistent rates.

The stone, boulder, bajri and sand industry directly and indirectly provides employment to the skilled or unskilled people which help to improve the economic condition of village. The CER activities and environmental safeguards are taken by project proponent who helps in further improvement of locality.

8.6 CORPORATE ENVIRONMENT RESPONSIBILITY

Corporate Environment Responsibility (CER) refers the responsibility of corporate or company or the proponent of any project towards environment and society. The project proponent will spend 2% (Rs. 40,000) of project cost i.e 20 lakhs for CER activities.

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9 ENVIRONMENTAL COSTS AND BENEFIT ANALYSIS

Various benefits are envisaged while planning for the mining of stone, boulders, bajri& sand from Giri river. Stone, boulders, bajri & sand are very important minor mineral and is the principal raw material for meeting the huge demand of construction material required in building construction and infrastructure works, road material for construction and maintenance of roads/highway, elastic ballast material for rail tracks in the State of Himachal Pradesh and nearby cities and towns of Punjab.

9.1 SOCIAL INFRASTRUCTURE

- Extraction of stone, boulders, bajri & sand will help in land cutting from nearby agricultural fields and forests.

9.2 EMPLOYMENT POTENTIAL

- The proposed project will provide direct employment to skilled/unskilled and semiskilled laborers.
- The proposed project will also provide indirect employment to local people in different activities such as transportation, food points, plantation activities, water tanker supply, hand etc.
- Besides labours managerial and administrative staff will also be employed.

9.3 TANGIBLE SOCIAL BENEFITS

- Proponent will undertake awareness program and community activities like health camps, medical aids, family welfare camps, and AIDS awareness programme etc.
- A massive plantation will be done surrounding area after consultation with forest department.

9.4 DIRECT/INDIRECT BENEFITS

- It will generate revenue for the State of Himachal Pradesh.
- It will cater the demand of raw material for construction purpose

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10 ENVIRONMENT MANAGEMENT PLANS

10.1 INTRODUCTION

The environment management plan has been developed with a view to bring down the levels of impacts as discussed in the preceding chapters within limits. In each of the areas of impact, measures have to be taken to reduce potentially significant adverse impacts and where these are beneficial in nature, such impacts are to be enhanced/ augmented so that the overall adverse impacts are reduced to as low level as possible. Measures to be taken for each of the impact areas are detailed in the following paras:

The EMP has therefore been made considering implementation and monitoring of environmental protection measures during and after mining operations.

10.2 ENVIRONMENTAL MANAGEMENT CELL (EMC)

It is imperative to establish an effective organization to implement, maintain, monitor and control the environmental management system. A separate Environmental Management Cell (EMC) will be formed to look after the environment related matter of the mine. The structure of EMC is as follows:

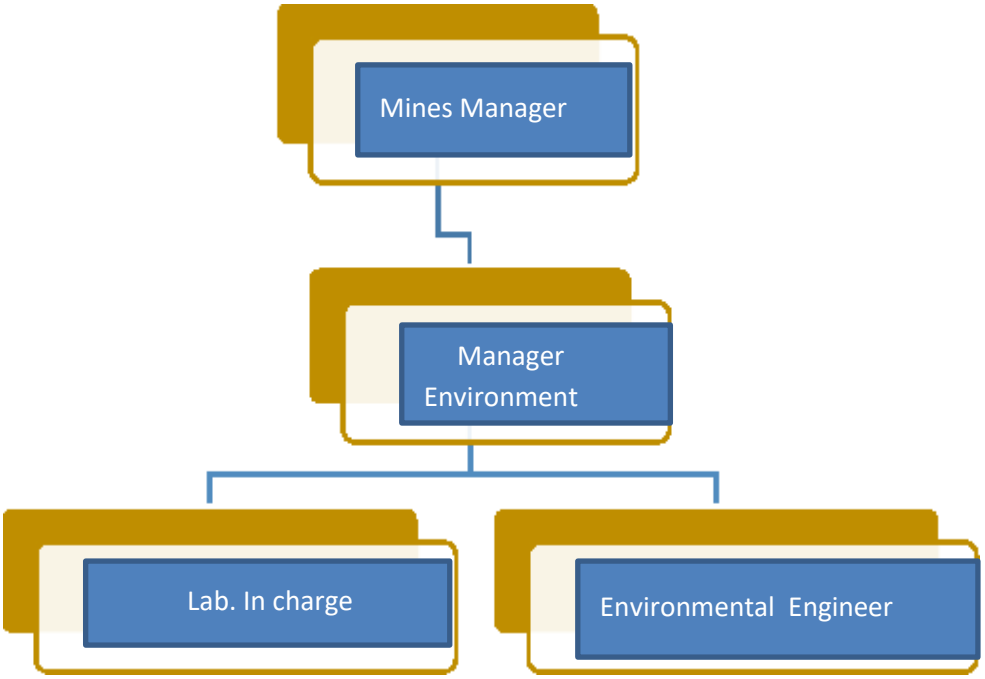

FIGURE 10-1 HIERARCHY OF ENVIRONMENTAL MANAGEMENT CELL (EMC)

Duties of EMC

- EMC will oversee that environmental control measures are implemented as per the plan.
- EMC will ensure ambient Field monitoring like air monitoring, meteorological monitoring and noise monitoring in coordination with outside agencies.
- Reporting the status report to the statutory authorities.
- Systematically document and record keeping w.r.t. environmental issues.
- Plantation and their maintenance
- Collection statistics of health of workers and population of surrounding villages.
- Environmental Compliance to the regulatory authority.

- Communication with the concerned department on the environmental issue.
- Monitoring the progress of implementation of environmental management programme.

10.3 LAND ENVIRONMENT MANAGEMENT

Degradation of land is not a very significant adverse impact of mining due to creation of access roads, mining operations, and transportation of mined material. In order to prevent the environmental degradation of leased mine area and its surroundings, the following measures shall be taken;

- Mineral will be mined out after leaving 5-meter safety zone .
- In this activity, the work is proposed to be done manually as well as semi mechanically which will avoid adverse effects associated with heavy machinery and their functioning.
- The mining is planned in non-monsoon seasons only.
- Operations during daylight only.
- No foreign material shall be allowed to remain/spill in riverbed and catchment area, or no pits/pockets will be allowed to be filled with such material,

Movement of the vehicles on the road will be increased; however, non-metalled road leading to sand and stone mining area will be sprinkled with water at regular intervals. In addition to prevent spillage by trucks/tractor trolley, over loading should be controlled along with speed limit.

There is no soil over mineralized area. Soil Quality will be monitored on yearly basis in the area surrounding the core zone used for agricultural activity to check for any negative impacts on the soil quality.

Since mining lease area is a restored after mining so plantation will be done in the lease area however, plantation of suitable species like Kachnar, Neem, Amaltas, Toon, Bihul, Khirk, Seris, Shisham, Khair, Paja, Robinia, Ban, Bauhinia vahlii species etc. will be planted.

It is suggested to carry out plantation for five years with suitable species from the date of operation.

10.4 WATER POLLUTION CONTROL MEASURES

Surface water

The major source of surface water pollution due to sand mining is insignificant, however the following measures shall be undertaken to prevent water pollution.

- Utmost care will be taken to minimize spillage of stone and sand.
- Drains and their Catchments will be constructed just beside the access roads so that the storm water gets settled before flowing to the river/Nallah.
- The washing of trucks and tractor trolleys in the mining lease will be avoided.
- Plantation will be done to restore the affected mining lease area.

Ground water

There would not be any adverse effect on the ground water quality. The mineral formation does not contain any harmful element, which could percolate into the ground and pollute the ground water. Hence, no control measures are required.

- However, regular monitoring of quality in the existing hand pumps/tube wells in the vicinity would be carried out both with reference to area and times intervals to study the hydrodynamics of the strata.

10.5 AIR POLLUTION CONTROL MEASURES

The proposed mining operations are not anticipated to raise the concentration of the pollutants beyond prescribed limits. However, the following measures would be adopted to mitigate the PM_{10} level in the ambient air. Dust particles generated during various mining activities when become airborne lead to increase in PM_{10} level in the ambient air. The major source of dust generation is the transport of material by trucks and tractor trolleys. Adequate control measures shall be taken during mining operations as well as transportation of minerals.

The following steps shall be adopted to prevent air pollution due to airborne dust.

- Plantation will be done along the road-sides and also at the crusher site after consultation with local villagers/authority.
- Dust mask provided to the workers engaged at dust generation points like excavations, loading and unloading points.
- The only air pollution sources are the road transport network of the trucks. The dust suppression measures like water spraying will be done on the roads.
- Utmost care will be taken to prevent spillage of sand and stone from the trucks.
- Water sprinkling will be done to reduce the emission of dust due to transportation of minerals.
- Overloading will be prevented. The trucks/ tractor trolley will be covered by tarpaulin covers.

10.6 NOISE POLLUTION CONTROL MEASURES

As there will be no heavy earth moving machinery there will not be any major impact on noise level due to sand mining and other association activities a detailed noise survey has been carried out and results were cross referenced with standards and were found to be well within limits.

Blasting technique is not used for sand and stone lifting, hence no possibility of land vibration. It was found that the proposed mining activity will not have any significant impact on the noise environment of the region. The only impact will be due to transportation of sand and stone by trucks and tractor trolleys.

As the only impact is due to transportation of stone to the stone crushing unit and sand to the market though village roads, the following control measures shall be taken to keep the ambient noise levels well within limits:

- Minimum use of horns and speed limit of 10 kms in the village area.
- Timely maintenance of vehicles and their silencers to minimize vibration and sound.
- Phasing out of old and worn-out trucks.
- Provision of green belts in consultation with village panchayat along the road networks.
- Care will be taken to produce minimum sound during sand and stone loading.

10.7 BIOLOGICAL ENVIRONMENT

The mining activity will have insignificant effect on the existing flora and fauna. Data have been collected from various Government Departments such as forests, agriculture, fisheries, animal husbandry and various offices to establish the pre project biological environmental conditions. It was found that the sand and stone mining activity will not have any significant impact on the biological environment of the region.

Mitigation measures of impacts on biological environment

1. It will be ensured that no mining activity will be carried out during the monsoon season.
2. As the mining site has no vegetation, no clearance of vegetation will be done.
3. Sprinkling will be done on the haul roads with water to avoid the dust emission, thus avoiding damage to the crops.
4. Mining will be carried out day time only.
5. No discard of food, polythene waste etc. will be allowed in the lease area which would distract/attract the wildlife.
6. No nighttime mining will be allowed which may catch the attention of wild.
7. Corridor for movement of wild mammals (If exists) will be avoided for mining/travelling purposes.
8. Workers will be made aware of the importance of the wildlife and signage will be displayed at the sensitive area to caution worker and other passerby.

10.8 SOCIO-ECONOMIC ENVIRONMENT

This project operation will provide livelihood to the poorest section of the society. The overall impact of mining of stone, boulders, bajri & sand on the social economics of the area shall be a very positive one, as not only it will generate employment opportunities for local population at mine site but also in associated activity i.e at stone crushing plant, for transportation of mined material, etc. It will also give a good boost to the general economy of the area. About 30 persons shall be employed at mine site and approximately 25-30 total people are to be benefited directly or indirectly by the project

Anticipated impacts and evaluation

The results of the field survey conducted based on a questionnaire prepared to understand the knowledge and perception of the people living around the project area, gives a clear idea about the need for the project. A major portion of the houses in the study area are pucca type structures. The solid waste generated in the area is dumped into open land since there are no collecting agencies in the area. The awareness level regarding the proposed mining activity is very high.

The proposed mining activity is expected to provide stimulus to socio-economic activities in the region and thereby accelerate further development processes. However, there is an apprehension that local people may get engaged in illegal activities if the proposed mining operation or the project is shelved or there is inordinate delay in its execution.

10.9 ENVIRONMENTAL MONITORING PROGRAM

The following monitoring programme is proposed for the project to undertaken on commencement of mining activity. The monitoring of liked project i.e Stone Crusher shall be carried out as per the norms of State Pollution Control Board to meet the prescribed standards under EPA Act 1986.

Methodology of environment management

The proponent shall follow the standard methods for half yearly monitoring various environmental parameters i.e Air Water and Soil. The estimated cost of EMP is given in Table below: -

TABLE 10-1ESTIMATED EXPENDITURE ON ENVIRONMENTAL MEASURES

S.NO	TITLE	CAPITAL COST RS IN LAKHS	RECURRING COST/YR RS IN LAKHS	RECURRING COST RS IN LAKHS FOR 5 YRS	TIMELINE
1.					
2.					
3.	**No. of plants = 8656 Plants** ***No.Ft.1790-/71(D)2011-12/Vol-VIII(Norms), Himachal Pradesh Forest Department, Shimla Dated 07 June 2019**				
4	***@1469.25/cu.m*(@Rs.979.50/cu.m And 50% escalation cost. Dry rubble masonry in breast wall and retaining walls revetment walls and parapets etc. as per Standard Schedule of Rate 2009 H.P.)***				
5	Septic tank	0.20	0.06	0.30	Constructed before the mining operation started

6	***@3004.05/cu.m. Dry rubble masonry in breast wall and retaining walls revetment walls and parapets etc. as per Standard Schedule of Rate 2009 H.P.)***				
Total					**---------**

NOTE: It is suggested to construct a check dams in the mining leases. This structure will help in stop erosion. The cost shall be contributed by owners of mine leases namely **Sh. Lakhwinder Singh S/o Sh. Jagmail Singh.**

Conclusion

All possible environment aspects have been adequately assessed and necessary control measures have been formulated to meet statutory requirements. Thus, implementing this project will not have any appreciable negative impacts.

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11 SUMMARY AND CONCLUSION

11.1 INTRODUCTION

The proposed project is the extraction of stone, boulder, bajri and sand from Khasra No. 1165, 1166, 1169, 1173, 1174, 1196,1197, 1198, 1200, 1206, 1206/1, 1226, 1227 located Mauza/Mohal Kuthar Beet, Tehsil Haroli, District Una, Himachal Pradesh. The proposed area of mining lease is (7.2135Ha), As per MoEF, New Delhi Gazette dated 14th September 2006 and amended thereof, the proposed mining project is categorized as **category 'B1'** project.

The baseline monitoring period of the said project is from Oct. 2022 to Dec. 2022

11.2 DETAILS OF MINING PROCESS & LOCATION

TABLE 11-1 DETAILS OF MINING PROCESS & LOCATION

Project name	Extraction of stone, Bajri and sand Proposed by Sh. Lakhwinder Singh S/o Sh. Jagmail Singh.
Mining Lease Area	7.2135 ha.
Location of mine	1165, 1166, 1169, 1173, 1174,1196,1197,1198,1200, 1206,1206/1,1226,1227 Mauza/Mohal Kuthar Beet in Tehsil Haroli, District Una, Himachal Pradesh
Latitude	31° 23' 53.47" N to 31° 23' 29.23" N
Longitude	76° 10' 22.51" E to 76° 10' 32.01"E
Toposheet number	53A3, 53A7
River/Nallah/Tanks/Lakes etc.	Soan River
Minerals of mine	Stone, Bajri and Sand
Proposed production of mine	3,54,258 MTPA
Method of mining	Semi Machanized
No of working days	270 days
Cost of the Project	20 Lakhs
Water demand	1.35 (Domestic) + 6.0 (Dust Suppression) = 7.35 KLD
Sources of water	Water will be supplied from Bore well for drinking purpose & dust suppression which is located khatta No.162min khatuni no. 253min Khasra No. 2180 in mohalla VPO Kungrat Tehsil Haroli District Una H.P.

Proposed Production

It is proposed to mine of about 3,54,258 TPA stone, bajri & sand. Waste will be generated 39,362 TPA of top soil along with mine waste will be mined.

Method of mining

Mining will be done semi mechanically along the along with leaving 5-meter safety zone. Drilling and blasting is not proposed 3,54,258 TPA of stone, boulder, bajri & 39,362 TPA of topsoil along with mine waste will be mined. Trucks/tractors/trolleys will be used for the mineral transportation. Maximum depth will be restricted to 1mbgl.

11.3 ENVIRONMENT MANAGEMENT PLAN

Land Environment

Degradation of land is not a very significant adverse impact of mining due creation of access roads, mining operations, transportation of mined material. In order to prevent the environmental degradation of leased mine area and its surroundings, the following measures shall be taken:

As per the policy guidelines, no mining shall be allowed within five meters safety zone.

- The stop erosion 5 check dams and retaining structure will be constructed during mining activities.
- Thus, no mining will be undertaken during monsoon period. It will be undertaken only during dry seasons.

Movement of the vehicles on the road will be increased; however, non metalled road leading to sand and stone mining area will be sprinkled with water at regular intervals. In addition to prevent spillage by trucks/tractor trolley, over loading should be controlled along with speed limit.

11.4 PLANTATION AND SOIL CONSERVATION

Before the onset of monsoon season, will be done progressively till the final closure of the mine. Soil Quality will be monitored on yearly basis in the area surrounding the core zone used for agricultural activity to check for any negative impacts on the soil quality. Plantation activity shall be undertaken bench wise to improve the land quality, aesthetics and reduce soil erosion.

Post mining land use

The mining has been proposed in such a way that the land will be reclaimed concurrently from the end of mining year onward in each pit to restore its maximum original topography, the backfilled area shell be leveled, and it can be used for agriculture purpose.

11.5 WATER POLLUTION CONTROL MEASURES

Surface water

The major source of surface water pollution due to sand mining is insignificant, however the following measures shall be undertaken to prevent water pollution.

- Utmost care will be taken to minimize spillage of stone and sand.
- Drains and their Catchments will be constructed just beside the access roads so that the storm water gets settled before flowing to the river.
- The washing of trucks and tractor trolleys will be avoided near source of water.
- Plantation will be done along the road-sides and also at the crusher site after consultation with local villagers/authority.

Ground water

There would not be any adverse effect on the ground water quality. The mineral formation does not contain any harmful element, which could percolate into the ground and pollute the ground water. Hence, no control measures are required.

However, regular monitoring of quality in the existing hand pumps/tube wells in the vicinity would be carried out both with reference to area and times intervals to study the hydrodynamics of the strata.

Air pollution control measures

The proposed mining operations are not anticipated to raise the concentration of the pollutants beyond prescribed limits. However, the following measures would be adopted to mitigate the PM_{10} levels in ambient air.

Dust particles generated during various mining activities when become airborne lead to increase in PM_{10} level in the ambient air. The major source of dust generation is the transportation of material by trucks and tractor trolleys. Adequate control measures shall be taken during mining operations as well as transportation of minerals.

The following steps shall be adopted to prevent air pollution due to airborne dust.

- Green belts shall be developed on nearby areas.
- Dust mask provided to the workers engaged at dust generation points like excavations, loading and unloading points.
- The only air pollution sources are the road transport network of the trucks. The dust suppression measures like water spraying will be done on the roads.
- Utmost care will be taken to prevent spillage of sand and stone from the trucks.
- Water sprinkling will be done to reduce the emission of dust due to transportation of mineral
- Overloading will be prevented. The trucks/ tractor trolley will be covered by tarpaulin covers.

11.6 NOISE POLLUTION CONTROL MEASURES

As there will be no heavy earth moving machinery there will not be any major impact on noise level due to sand mining and other association activities a detailed noise survey has been carried out and results were cross referenced with standards and were found to be well within limits.

Blasting technique is not used for sand and stone lifting, hence no possibility of land vibration. It was found that the proposed mining activity will not have any significant impact on the noise environment of the region. The only impact will be due to transportation of sand and stone by trucks and tractor trolleys.

As the only impact is due to transportation of stone to the stone crushing unit and sand to the market though village roads, the following control measures shall be taken to keep the ambient noise levels well within limits:

- Minimum use of horns and speed limit of 10 kms in the village area.
- Timely maintenance of vehicles and their silencers to minimize vibration and sound.
- Phasing out of old and worn-out trucks.

- Provision of green belts in consultation with village Panchayat along the road networks.
- Care will be taken to produce minimum sound during sand and stone loading.

11.7 BIOLOGICAL ENVIRONMENT

The mining activity will have insignificant effect on the existing flora and fauna. Data have been collected from various Government Departments such as forests, agriculture, fisheries, animal husbandry and various offices to establish the pre project biological environmental conditions. It was found that the sand and stone mining activity will not have any significant impact on the biological environment of the region.

Mitigation measures of impacts on biological environment

1. It will be ensured that no mining activity will be carried out during the monsoon season.
2. As the mining site has no vegetation, no clearance of vegetation will be done.
3. Sprinkling will be done on the haul roads with water to avoid the dust emission, thus avoiding damage to the crops.
4. Mining will be carried out day time only.
5. No discard of food, polythene waste etc. will be allowed in the lease area which would distract/attract the wildlife.
6. No nighttime mining will be allowed which may catch the attention of wildlife.
7. Workers will be made aware of the importance of the wildlife and signage will be displayed at the sensitive areas to caution the workers & other passerby.

Socio-economic environment

This project operation will provide livelihood to the poorest section of the society. The overall impact of mining of sand, stone and bajri on the social economics of the area shall be a very positive one, as not only it will generate employment opportunities for local population at mine site but also in associated activity i.e., at stone crushing plant, for transportation of mined material, etc. It will also give a good boost to the general economy of the area.

Anticipated impacts and evaluation

The results of the field survey conducted based on a questionnaire prepared to understand the knowledge and perception of the people living around the project area, gives a clear idea about the need for the project. A major portion of the houses in the study area are *pucca* type structures. The awareness level regarding the proposed mining activity is very high proposed mining activity is expected to provide stimulus to socio-economic activities in the region and thereby accelerate further development processes. However, there is an apprehension that local people may get engaged in illegal activities if the proposed mining operation or the project is shelved or there is inordinate delay in its execution.

11.8 BENEFITS OF MINING:

The proposed activity shall provide raw material to Stone crusher there by boosting production of construction material. This will bring overall improvement in infrastructure development and economic growth of the area.

- Generating useful economic resource for construction.
- Generating employment and improvement of socio-economic conditions of the

study area.

Improvement in the physical infrastructure

The proposed stone, boulder, bajri & sand mine will have numerous induced impacts on society such as growth in schools, hospitals, hotels & resorts, transport etc. It will also attract other entrepreneur to establish their venture in the region.

Improvements in the social infrastructure

The social infrastructure like religious places (Temple, Mosque, Church, Gurudwara); marriage homes, Bus stations, railway stations, playgrounds will be improved.

11.9 CONCLUSION

This Project will provide several benefits to the nearby villages by a proper planning and management. This project will employ most of the worker from nearby villages. There will not be any increase in population due to the project. However, few people from other area may migrate in this area for business opportunities. During the operation of this project no adverse impact on the surrounding environment. So, project is beneficiary for the surrounding village.

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12 DISCLOSURES OF CONSULTANTS

The consultant has been engaged to conduct Environmental Impact Assessment study of the proposed stone, bajri & sand Mining Project to be proposed by Sh. Lakhwinder Singh S/o Sh. Jagmail Singh Tehsil Haroli, Distt. Una, (H.P). M/s Shivalik Solid Waste Management Limited, Nalagarh has been appointed as Consultant.

Brief profile of SSWML is as below: -

Name of the Consultancy Company	M/s Shivalik Solid Waste Management Ltd.
Address	**Registered Office:**
	Village-Majra, P.O. Dabhota, Tehsil Nalagarh, Distt. Solan, Himachal Pradesh - 174101 Phone/Telefax: 01795-260427, 260227
	Zirakpur Office:
	SCO 20-21, 2nd Floor, Near Hotel Dolphin, Baltana, Zirakpur Punjab- 140604 Phone/Telefax : 01762 509496
E-mail Address	infoshivalikeia@gmail.com infosswmlmkt@gmail.com
Website	www.sswml.net
Nature of Services	Treatment, Storage & Disposal Facility, **EIA Consultancy**, Environmental, Health & Safety Auditing, EMS, Environment Impact Assessment, Environmental Monitoring & Laboratory Analytical Services, Waste water Management, Energy Audit Greens Concept Development, etc.

Shivalik Solid Waste Management Limited (SSWML), EIA Division, Zirakpur is offering high quality technical services in the field of EIA, Environment, Health & Safety (EHS), and Environmental Monitoring & Laboratory Analytical Services etc.

SSWML is supported by distinguished professionals, engineers, scientists etc. SSWML professionals have excellent experience in executing EIA and other environmental projects.

Environmental Monitoring & Laboratory analytical study was done by Noida Testing Laboratory (An ISO: 9001; 2015, ISO 14001;2015 & ISO 45001;2018 & NABL accredited Laboratory) GT-20, Sector-117, Noida, Gautam Budh Nagar-201301, Uttar Pradesh.

Following experts are associated with SSWML for EIA and Environmental projects.

EIA Coordinator: Mr. Silbhadra Brahma

Signature: 

TABLE 12-1KEY PERSONAL/EXPERTS ASSOCIATED WITH THE STUDY

S. No.	Functional Areas	Name of the Expert/s	Involvement (Period & Task**)	Signature
1.	AP* (Air Pollution Monitoring, Prevention & Control)	Mrs. Daksha Gupta	Quantification of Air pollution and Assessment of Impacts. Period of Involvement: May 2017 till date	
2.	WP* (Water Pollution Monitoring, Prevention & Control)	Mrs. Daksha Gupta & Mr. Sanjay Sharma	Quantification of water pollution and Assessment of Impacts.	 
3.	SHW* (Solid and Hazardous Waste Management)	Mrs. Daksha Gupta	Quantification of Solid & Hazardous Waste and Assessment of Impacts.	
4.	SE* (Socioeconomics)	Mrs. Sayantani Chatterjee & Ms. Sunita Devi	Collection and Compilation of Socio-economic data. scenario and CSR Plan.	 
5.	EB* (Ecology & Biodiversity)	S. Brahma	Conducted primary survey work at site, collected information about flora and fauna from Forest dept and checked.	

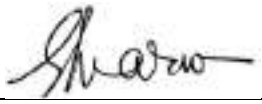
6.	HG* (Hydrology, Ground Water & Water Conservation)	Yamesh Sharma	Provided guidance on Hydrology aspects of the EIA Report.	
7.	GEO* (Geology)	Subhash Chander Sharma	Geology and geomorphologic analysis based on secondary data.	
8.	SC* (Soil Conservation)	S. Brahma	Interpretation of baseline data of soil analysis and its interpretation. Preparation of Final report considering impact and mitigation on Soil as per guidelines.	
9.	AQ* (Meteorology, Air Quality Modeling & Prediction)	Mrs. Daksha Gupta	Checking air quality data, evaluation of results of Ambient Air Quality Monitoring (AAQM), As there is no source emission & very little Fugitive emission. No Air Quality Modelling was required.	
10.	NV* (Noise & Vibration)	Vinay Kurakula	Quantification of Noise & Vibration and Assessment of Impacts.	
11.	LU* (Land use)	Vinay Kurakula	Prepared Land Use Land Cover Maps.	
12.	RH* (Risk Assessment & Hazard Management)	Mr. Ashok Sharma	Identification and Assessment of Risk and Hazards.	

Table12-2: Key Personnel/FAA(Functional Area Associate) Associated with the Study

S.No	Functional Areas	Name of the TM/FAA	Involvement (Period & Task**)	
1.	**Team Member with FAE & EIA Coordinator**	MS. Sunita Devi (TM)	coordinator in compilation and Interpretation of base line data in the Final EIA report. Assisted approved FAE in SE.	
2.	**Team Member with FAE (LU, HG*)**	Mr. Gaurav Chauhan (TM)	compilation and Interpretation of base line data in the Final EIA report.	
3.	**Team Member with FAE (SC, AP)**	Ms. Kamini Bhardwaj (FAA)	compilation and Interpretation of base line data in the Final EIA report.	
4.	**Team Member with FAE**	Ms. Parul Thakur	compilation and Interpretation of base line data in the Final EIA report.	
5.	**Team Member with EIA Coordinator (WP)**	Smt. Bharti Naudiyal	Assisted & EIA coordinator in compilation and Interpretation of base line data in the Final EIA report.	
6.	**Team Member with FAE**	Smt. Hema Kango	Assisted FAEs in compilation and Interpretation of base line data in the Final EIA report.	

Declaration by the Head of the Accredited Consultant Organization/ Authorized person

I, Ashok Sharma, hereby, confirm that above-mentioned experts prepared the Final EIA of. Proposed Common Effluent Treatment Plant (CETP) having capacity 05 MLD at Industrial Area, Sector-26, Bhiwani, Haryana by Haryana Shaheri Vikas Pradhikaran (HSVP). I also confirm that the consultant organization shall be fully accountable for any mis-leading information mentioned in this statement.

Signature:
Name: Ashok Kumar Sharma
Designation: CEO
Name of the EIA Consultant Organization: Shivalik Solid Waste Management Ltd.
NABET Certificate No. NABET/EIA/2023/SA -0169 Date of Expiry 16.08.2023.
NABET Certificate is attached as **Annexure XIV.**

ANNEXURES

State Level Environment Impact Assessment Authority
Himachal Pradesh

Ministry of Environment, Forest & Climate Change, Government of India,
at Department of Environment Science & Technology,
Paryavaran Bhawan, Near US Club, Shimla-1
Ph: 0177-2656559, 2659608 Fax: 2659609

Dated: 01/07/ 2023

F. No HPSEIAA/2022/1000-1607-14

To

Sh. Lakhwinder Singh,
S/o Sh. Jagmail Singh, HIG- 824,
Phase-II, Mohali, Punjab

Subject: **Project proposal for Mining of Minerals – Terms of References:-reg.**

Sir/Madam,

This has a reference to your online application No. SIA/HP/MIN/81950/2022 for approval of Terms of References for undertaking Environment Impact Assessment Study for further seeking Environmental Clearance under Environment Impact Assessment Notification, 2006.

The proposal has been appraised as per prescribed procedure in the light of provisions under the Environment Impact Assessment Notification, dated 14th September 2006 on the basis of documents viz; Form-I, Pre-feasibility Report, Proposed ToRs etc. by the State Expert Appraisal Committee constituted by the competent authority in its 93rd meeting of the SEAC held on dated 7th June, 2023. The said project involves following salient features:

a)	Proposal No.	SIA/HP/MIN/81950/2022 - HPSEIAA/2022/1000
b)	Project type	Extraction of Sand, Stone & Bajri.
c)	Project Location	Khasra number 1165, 1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227 falling in Mauza Kuthar Beet, Mohal Jodian Kuthar Beet. Tehsil-Haroli, Distt. Una, HP.
d)	Jamabandi	Jamabandi for the year 2016-17
e)	Land Status	Private Land.
f)	Capacity	3,54,258 TPA.
g)	Mining Area	07-21-35 Hectare, Hill slope/Private land.
h)	Leases with in 500 meter from the periphery of the area applied	One mining lease exist within 500 meters:- 1 Lakhwinder Singh Stone Crusher (03-89-94 Hectare)
i)	Letter of Intent	Letter of Intent issued on dated 27/08/2021 (Valid for one year i.e. up to 26/08/2022)
j)	Validity period of ToR	3 Years as per the provision of EIA Notification 2006 & OM No. J-11013/41/2006-IA-11 (I) (Part) dated 29/08/2017 issued by MoEF&CC, GoI

The SEIAA examined the proposal in its 63rd meeting held on dated 13th June, 2023 and considered the recommendations made by SEAC in its 93rd meeting of the SEAC held on dated 7th June, 2023. After considering the recommendations of the State Level Expert Appraisal Committee, the State level Environmental Impact Assessment Authority under the provisions of EIA Notification 2006, accord approval to standard Terms of References as published by MoEF&CC, GoI afresh for Mining of Minerals, for the purpose of preparing Environment Impact Assessment Report, Environment Management Plan for obtaining prior Environment Clearance with public consultation, if applicable, with the following additional conditions:

1) The project proponent shall include the detailed analysis of GLC-2 5 with air modeling and shall prepare the wind-rose diagram of the site to plan the installation of PCDs. The air, water etc. sampling and analysis to be recorded and to be submitted to SEIAA with records.
2) The project proponent shall submit affidavit to erasure that, after ceasing mining operations, undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.
3) The project proponent shall make provision of depositing capital cost (@ Rs. 4.00 lacs per ≤ ha.) under CER, in the form of Demand Draft/ Transfer of funds in mentioned A/c No. to the office of Director (DEST&CC), GOHP.
4) The District Magistrate shall furnish public hearing proceedings with clear cut recommendation failing which the SEIAA shall refer back the PH proceedings to DC concerned for the same.

27/6/23

Member Secretary
State Level Environment Impact Assessment Authority
Himachal Pradesh

Dated: 2023.

Endst. No. As Above.

Copy to following for further necessary action:

1. The Secretary (Environment), Ministry of Environment, Forests & Climate Change (MoEF&CC), GoI, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi - 110003
2. The Chairman, Central Pollution Control Board, Him Parivesh Bhawan, CBD-cum-office Complex, East Arjun Nagar, New Delhi-110032.
3. The Chairman, Himachal Pradesh State Pollution Control Board, Shimla-171009.
4. The Director (Environment, Science & Technology) to the GoHP, Shimla-171001.
5. The Adviser (IA), MoEF&CC, GoI, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi - 110003.
6. The Integrated Regional Office, MoEF&CC, CGO Complex, Shivalik Khand, Longwood, Shimla, HP-171001.
7. The Monitoring Cell, MoEF&CC,GoI, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi - 110003
8. Record File.

Member Secretary
State Level Environment Impact Assessment Authority
Himachal Pradesh

File No.HPSEIAA/2022/1000

Goverment of India

State Level Environment Impact Assessment Authority

Himachal Pradesh

***

To,

M/s LAKHWINDER PANAG
Sh. lakhwinder Singh So Sh. Jagmail Singh HIG824, Phase II, Mohali Punjab,
SAS Nagar-160055
Himachal Pradesh

Tel.No.--1; Email:lakhwindersinghmine@gmail.com

Sub. Terms of Reference to the Mining of Sand Stone and Bajri from Mauza/Mohal Kuthar beet Tehsil Haroli, District Una H.P., Mauza Kutharbeet, Mohal Jorrian Kutharbeet, Tehsil Haroli, District Una, Himachal Pradesh

Dear Sir/Madam,

This has reference to the proposal submitted in the Ministry of Environment, Forest and Climate Change to prescribe the Terms of Reference (TOR) for undertaking detailed EIA study for the purpose of obtaining Environmental Clearance in accordance with the provisions of the EIA Notification, 2006. For this purpose, the proponent had submitted online information in the prescribed format (Form-1) along with a Pre-feasibility Report. The details of the proposal are given below:

1. Proposal No.:	SIA/HP/MIN/81950/2022
2. Name of the Proposal:	Mining of Sand Stone and Bajri from Mauza/Mohal Kuthar beet Tehsil Haroli, District Una H.P.
3. Category of the Proposal:	Non-Coal Mining
4. Project/Activity applied for:	1(a) Mining of minerals
5. Date of submission for TOR:	06 Aug 2022

Date : 15-10-2022

Lalit Jain
(Director (Environment, Science & Technology))

Office : **Paryavaran Bhawan, US Club, Shimla-I**
Phone No : **-1** Mobile : **9815501015**
Email id : **ms.hpseiaa@gmail.com**

Note : This is auto tor granted letter.

In this regard, under the provisions of the EIA Notification 2006 as amended, the Standard TOR for the purpose of preparing environment impact assessment report and environment management plan for obtaining prior environment clearance is prescribed with public consultation as follows:

STANDARD TERMS OF REFERENCE (TOR) FOR EIA/EMP REPORT FOR PROJECTS/ACTIVITIES REQUIRING ENVIRONMENT CLEARANCE

Terms of Reference (TOR) for preparation of Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) for "Mining of Minerals" as per the EIA Notification, 2006 has been devised to improve the quality of the reports and facilitate decision-making transparent and easy. TOR will help the project proponents to prepare report with relevant project specific data and easily interpretable information. TOR for mining of minerals is expected to cover all environmental related features.

Mining of minerals plays a positive role in the process of country's economic development. In addition to the contribution towards economic growth, mining can also be a major source of degradation of physical as well as social environment, unless it is properly managed. Environmental impacts can arise during all activities of the mining process. Minimizing the damage due to mining operations depends on sound environmental practices in a framework of balanced environmental legislation. The potential adverse effects of mining activities include air pollution, surface and groundwater pollution, noise and vibration, damage to local ecology, natural topography and drainage, depletion of water resources etc. All these environmental components are required to be considered while selecting a proper methodology of mining, mitigation measures to reduce pollution load, conservation of natural resources etc.

The projects of mining of minerals as stated in the schedule require prior environment clearance under the EIA notification, 2006. Category 'A' Projects are handled in the MoEF&CC and Category 'B' projects are being handled by the respective State Environment Impact Assessment Authorities (SEIAAs) notified by MoEF&CC and following the procedure prescribed under the EIA Notification, 2006. As per this Notification, as amended, the projects of mining of minor minerals with mining lease area equal to or greater than 50 hectare are to be handled at the level of the MoEF&CC for grant of EC. Such projects with mining lease area less than 50 hectare are to be handled by the respective State Environment Impact Assessment Authority (SEIAA).

1(a):STANDARD TERMS OF REFERENCE FOR CONDUCTING ENVIRONMENT IMPACT ASSESSMENT STUDY FOR NON-COAL MINING PROJECTS AND INFORMATION TO BE INCLUDED IN EIA/EMP REPORT

1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.

2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.

3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.

4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the areashould be provided. Such an Imagery of

the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).

5) Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.

6) Details about the land proposed for mining activities should be givenwith information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.

7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large,may also be detailed in the EIA Report.

8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.

9) The study rea will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.

10) Land use of the study rea delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.

11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.

12) A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.

13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.

14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.

15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.

16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.

17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlifeand copy furnished.

18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan alongwith budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.

19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered.

20) Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).

21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.

22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.

23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.

24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.

25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.

26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.

27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.

28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-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.

29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.

30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.

31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered

under plantation and the species to be planted. The details of plantation already done should be given.The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.

32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.

33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.

34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.

35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.

36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.

37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.

38) Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.

39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.

40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.

41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.

42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.

43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.

44) Besides the above, the below mentioned general points are also to be followed:-

a) All documents to be properly referenced with index and continuous page numbering.

b) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.

c) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.

d) Where the documents provided are in a language other than English, an English translation should be provided.

e) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.

f) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.

g) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.

h) As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.

i) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

****

ANNEXURE II

No. Udyog-Bhu (Khani-4) Laghu-855/2020
Government of Himachal Pradesh
Department of Industries
"Geological Wing"

Dated, Shimla-171001, the 2021

LETTER OF INTENT

Sh. Lakhwinder Singh, S/o Sh. Jagmail Singh, HIG-824, Phase-II, Mohali, Punjab has applied for grant of mining lease over an area measuring 07-21-35 Hects. bearing Kh. Nos 1165 (00-03-09 Hect), 1166 (00-00-54 Hect), 1169 (00-01-08 Hect), 1173 (01-00-16 Hect), 1174 (00-42-47 Hect), 1196 (00-25-44 Hect), 1197 (00-02-71 Hect), 1198 (00-27-46 Hect), 1200 (00-31-99 Hect), 1206 (02-28-69 Hect), 1206/1 (00-94-49 Hect), 1226 (01-51-50 Hect) & 1227 (00-11-73 Hect), falling in Mauza Kuthar Beet, Mohal Jodian, Kuthar Beet of Tehsil Haroli, Distt. Una, for collection/extraction of Sand, Stone & Bajri, for use in already established stone crusher under name & style M/s Lakhwinder Singh Stone Crusher & Screening Plant unit-I, under the provisions of H.P. Minor Minerals (Concession) and Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules, 2015. The case was referred to the Joint Inspection Committee for inspection of the area applied for and on the basis of recommendations of the Joint Inspection Committee, the matter was referred to the Government for approval and as per approval conveyed vide Government letter No. Ind-II(F)6-7/2015 dated 13.08.2021 the Letter of Intent for the grant of mining lease for collection/extraction of sand, stone, bajri, for use in already established stone crusher in favour of Sh. Lakhwinder Singh, S/o Sh. Jagmail Singh, HIG-824, Phase-II, Mohali, Punjab over an area measuring 07-21-35 hectares (Hill Slope, Private land) bearing of Khasra Nos. 1165, 1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227 falling in Mauza Kuthar Beet, Mohal Jodian Kuthar Beet of Tehsil Haroli, Distt. Una, is hereby issued to submit the following documents:-

1. The party shall get the area demarcated from the revenue authorities and shall erect permanent boundary pillars to the satisfaction of the Mining Officer so as to clearly depict the provisional granted area. A copy of the demarcation report shall also be submitted to the Mining Officer.

2. The Party shall have to submit the approved Mining Plan under Rule 35 (1) of Himachal Pradesh Minor Minerals (Concession) and Minerals (Prevention of illegal Mining, Transportation and Storage) Rules, 2015.

3. The party shall have to obtain the Environment clearance under the Environment Protection Act, 1986 and Environment Impact Assessment Notification, 2006 and amendments/Notification issued time to time in this regard from the competent authority.

4. The party shall submit a certificate from the revenue authority to the effect that Khasra. Nos. 1165, 1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227 are free from all encumbrance and all the co-sharers of above said land have given their consent.

5. The party shall settle the dispute, arises if any, between him and land owners/co-sharers/right holders at his own level and shall indemnify the Govt. in this behalf.

The letter of Intent is subject to any orders passed by the Hon'ble Supreme Court of India/National Green Tribunal/High Court of Himachal Pradesh or other concerned Departments from time to time in this regard. This letter of Intent is valid only for obtaining requisite clearance from the Competent Authority.

The grant order imposing all the conditions and stipulations relevant as per the rules shall be issued only after submission of documents as mentioned at serial Nos. 1 to 5 above and after completing codal formalities. This letter of intent shall be valid for a period of one year. Thereafter, extension of provisional period shall be granted only after reviewing of the progress made for fulfillment of the above said documents. The party shall not resort to any mining activity till the execution of mining lease.

State Geologist
Himachal Pradesh

27-8-21

Registered 4198

Sh. Lakhwinder Singh, S/o Sh. Jagmail Singh,
HIG-824, Phase-II, Mohali, Punjab.

Endst. No. Udyog-Bhu(Khani-4)Laghu-855/2020
Copy to the following for information and necessary action:-

1. The Addl. Secretary (Inds.) to the Govt. of Himachal Pradesh w.r.t. their letter No. Ind-B (F)6-7/2015 dated 13.08.2021.
2. The Member Secretary, H.P. State Pollution Control Board, Paryavaran Bhawan Phase-III, New-Shimla-171009.
3. The Mining Officer Una H.P.
4. Guard File.

State Geologist
Himachal Pradesh

ANNEXURE III

No.Udyog-Bhu(Khani-4)Laghu-855/2020 -/3371
Government of Himachal Pradesh
Department of Industries
Geological Wing
Shimla-171001, the 29/3/ 2022

To

Sh. Lakhwinder Singh, S/o Sh. Jagmail Singh,
HIG-824, Phase-II, Mohali, Punjab

Subject: Regarding issuance of Distance Certificate with respect to mining lease area.

Sir,

Enclosed please find herewith the distance certificate issued by the Mining Officer,Una, regarding distance from the granted/sanctioned mining lease areas/auctioned area within 500 mtrs. from the periphery of the mining lease applied area, for which Letter of Intent has been issued in favour of Sh. Lakhwinder Singh, S/o Sh. Jagmail Singh, HIG-824, Phase-II, Mohali, Punjab duly countersigned by the undersigned for taking further necessary action.

Yours faithfully

Encls. : As above.

State Geologist
Himachal Pradesh

Endst.No. Udyog-Bhu(Khani-4)Laghu-855/2020 Dated:
Copy to The Mining Officer, Una with reference to letter No.Udyog-(Bhu)-Laghu-UNA-Lakhwinder SCU-3651 dated 10.03.2022 for information.

State Geologist
Himachal Pradesh

Format for Certificate from Mining/Industries Department w.r.t. Mining Lease Located within 500 meters from the periphery of the area applied for.

.....

CERTIFICATE

Certified that, as per the report submitted by concerned Patwari in this office, 01 (One) mining lease granted/applied with the department with in 500 Mtr. from the periphery of the area applied for grant of mining lease by M/s Lakhwinder Singh Stone Crusher & Screening Plant Unit-I VPO Polian Beet, Tehsil Haroli, District Una, HP, over Kh. No. 1165, 1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1326 & 1227 measuring 07-21-35 Hect. in Mouza Kutharbeet Muhal Jodian Kutharbeet , Tehsil Haroli, Distt. Una, Himachal Pradesh

The status of mining lease is as under:

Sr. No.	Name of Mining Lease	Khasra No.	Area in Hectares	Mauza/ Mohal	Purpose	Status of EC/Mining lease whether operating or not operating
1.	Lakhwinder Singh Stone Crusher and Screening Plant Unit-I VPO Polian Beet Tehsil Haroli District Una HP	1202, 1203, 1204, 1205, 1232	03-89-94 hects.	Jodian Kutharbeet	Stone Crusher	Operational

Mining Officer,
Department of Industries,
Himachal Pradesh,
(Office Seal)

State Geologist
Himachal Pradesh

State Geologist,
Department of Industries,
Himachal Pradesh
(Office Seal)

ANNEXURE IV

राजस्व विभाग, हिमाचल प्रदेश - नकल जमाबंदी

एम.डी.ए रसीद संख्या: 2158121623937078

जिला	: ऊना	नाम	: a	नकल शुल्क :	1.00
तहसील	: दुलैहड़ (उप-तहसील)	पिता/पति	: b	सेवा शुल्क :	10
कानूनगोवृत	: दुलैहड़			कुल शुल्क :	11
पटवार वृत	: कुठारबीत				
हदबस्त न.	: 524				

मोहाल : औड़ियां कुठारबीत साल : 2016-2017 रकबा ईकाई: है-आ-से

खेवट नं. / नाम पत्ती या तरफ मय नाम नम्बरदार / मुताबला व शरह मुआमला व हबूब	खतौनी नं. / लगान जो मुजारा अदा करता है व तफसील शरह व लदाद	नाम मालिक व एहवाल	नाम काश्तकार व एहवाल	नाम चाह व दीगर वसायल आबपाशी	नम्बर खसरा हाल	रकबा हर खेत व मिजान खाता मय किस्म अराजी मीट्रीक ईकाईयों में	हिस्सा या पैमाना हकीयत व तरीका बाछ	कैफियत
1	2	3	4	5	6	7	8	9
76 मिन 75 [illegible] (1) 0.00 [illegible] 0.00 [illegible]	81 मिन 80	कुल भाग (2) [illegible] सिंह पुत्र [illegible] सिंह पुत्र [illegible] (1) भाग चौधरी [illegible] पुत्र [illegible] सिंह पुत्र [illegible] (1) भाग निवासी [illegible] कुठारबीत	कब्जा स्वंय		1105	00-03-09 बंजर कदीम	[illegible]	475 [illegible] [illegible] [illegible] चौधरी [illegible] पुत्र [illegible] सिंह पुत्र [illegible] [illegible] सिंह पुत्र [illegible] सिंह पुत्र [illegible] [illegible] दिनांक [illegible] को [illegible] हो चुका है।

AMIT KUMAR
LMK [illegible]
ID: [illegible]0018

आज [illegible] नोट [illegible] 13/6/22
[illegible]

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Jam04042210199

निर्माता : हिमाचल प्रदेश - शिमला दिनांक: 07-Jun-2022

राजस्व विभाग, हिमाचल प्रदेश - नकल जमाबंदी

एस.सी.ए रसीद संख्या: 2158121823350484

नाम : a
पिता/पति : b

नकल शुल्क :
सेवा शुल्क : 10
कुल शुल्क : 11

जिला : ऊना
तहसील : दुलैहड़ (उप-तहसील)
कानूनगोवृत : दुलैहड़
पटवार वृत : कुठारबीत
हदबस्त न. : 524

मोहाल : जौडियां कुठारबीत

साल : 2016-2017

रकबा ईकाई: है-आ-सै

खेवट नं. / नाम पत्ती या तरफ मय नाम नम्बरदार / मुताबला व शरह मुआमला व हबूब	खतौनी नं. / लगान जो मुजारा अदा करता है व तफसील शरह व तदाद	नाम मालिक व पहवाल	नाम काश्तकार व पहवाल	नाम चाह व दीगर वसायल आबपाशी	नम्बर खसरा हाल	रकबा हर खेत व मिजान वाला नए किस्म अराजी मीट्रिक ईकाइयों में	हिस्सा या पैमाना हकीयत व तरीका बाछ	कैफियत
1	2	3	4	5	6	7	8	9
78 मिन 75 [illegible] (1) 0.00 मान 0.00 स्थाई	81 मिन 80	कुल भाग (2) तिलक राज, अकाश सिंह पुत्र हाकम सिंह पुत्र अमी चन्द [illegible] (1) [illegible] चौधरी राम पुत्र प्रशोतम सिंह पुत्र अमी चन्द (1) भाग शिवाती महाल कुठारबीत	काबज स्वंय		1166	00-00-54 बंजर कदीम	[illegible] खेवट न.(1)	475 [illegible] [illegible] 475 [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] 05-03-2018 [illegible] [illegible] है।

AMIT KUMAR
LMK DULEHAR
ID: 27[illegible]0018

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Jam04042210200

राजस्व विभाग, हिमाचल प्रदेश - नकल जमाबंदी

एम.सी.ए रसीद संख्या : 2158122423976684

जिला	: ऊना	नाम	: a
तहसील	: दुलैहड़ (उप-तहसील)	पिता/पति	: b
कानूनगोवृत	: दुलैहड़	नकल शुल्क	1.00
पटवार वृत	: कुठारबीत	सेवा शुल्क	10
हदबस्त न.	: 524	कुल शुल्क	11

मोहाल : जौड़ियां कुठारबीत साल : 2016-2017 रकबा ईकाई: है-आर-मी

खेवट नं. / नाम पत्ती या तरफ मय नाम नम्बरदार / मुताबला व शरह मुआमला व हकूक	खतौनी नं. / लगान जो मुजारा अदा करता है व तफसील शरह व तदाद	नाम मालिक व एहवाल	नाम काश्तकार व एहवाल	नाम चाह व दीगर वसायल आबपाशी	नम्बर खसरा हाल	रकबा हर खेत व मिजान खाता मय किस्म अराजी मीट्रिक ईकाईयों में	हिस्सा या पैमाना हकीयत व तरीका बाछ	कैफियत
1	2	3	4	5	6	7	8	9
76 मिन 75 खाता खेवट न. (1) 0.00 मालिया 0.00 रसाई	81 मिन 80	कुल भाग (2) तिलक राज, अवतार सिंह पुत्र हाकम सिंह पुत्र अमी चन्द भाग बराबर (1) भाग चौधरी राम पुत्र बखतावर सिंह पुत्र अमी चन्द (1) भाग निवासी महाल कुठारबीत	कब्जा मालकान		1169	00-01-08 [illegible]	[illegible]	475 [illegible] [illegible] [illegible] 02-07-2018 [illegible] [illegible]

AMIT KUMAR
LMK DULEHAR
ID: 2[illegible]0018

[illegible]

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Jam04042210201

राजस्व विभाग, हिमाचल प्रदेश - नकल जमाबंदी

एस.सी.ए रसीद संख्या: 2158122723097651
नाम : a
पिता/पति : b

नकल शुल्क : 1.00
सेवा शुल्क : 10
कुल शुल्क : 11

जिला : ऊना
तहसील : दुलैहड़ (उप-तहसील)
कानूनगोवृत : दुलैहड़
पटवार वृत : कुठारबीत
हदबस्त नं. : 524
मोहाल : औड़ियां कुठारबीत
साल : 2016-2017
रकबा ईकाई : है-आ-मी

खेवट नं. / नाम पत्ती या तरफ मय नाम नम्बरदार मुताबिक व शरह मुआमला व हकूक	खतौनी नं. / लगान जो मुजारा अदा करता है व तफसील शरह व तादाद	नाम मालिक व पहचान	नाम काश्तकार व पहचान	नाम चाह व दीगर वसायल आबपाशी	नम्बर खसरा हाल	रकबा हर खेत व मिजान रकबा मय किस्म अराजी मीट्रिक ईकाईयों में	हिस्सा या पैमाना हकीयत व तरीका बाह	कैफियत
1	2	3	4	5	6	7	8	9
76 मिन / 73 / [illegible] (1) / 0.00 आम / 0.00 [illegible]	81 मिन / 80	[illegible] (2) [illegible] सिंह पुत्र [illegible] सिंह पुत्र [illegible] (1) [illegible] सिंह पुत्र [illegible] (1) [illegible] निवासी महाल कुठारबीत	कब्जा स्वंय		1173	01-00-15 / [illegible]	[illegible]	475 [illegible] [illegible]

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Jam04042210206

राजस्व विभाग, हिमाचल प्रदेश - नकल जमाबंदी

एस.सी.ए. रसीद संख्या: 2158122624018842

नाम : a

पिता/पति : b

नकल शुल्क : 1.00

सेवा शुल्क : 10

कुल शुल्क : 11

ज़िला : ऊना

तहसील : दुलैहड़ (उप-तहसील)

कानूनगोवृत : दुलैहड़

पटवार वृत : कुठारबीत

हदबस्त नं. : 524

मोहाल : जौहियां कुठारबीत

साल : 2016-2017

रकबा ईकाई: है-आ-मी

खेवट नं. / नाम पत्ती या तरफ मय नाम नम्बरदार / मुताबला व शरह मुआमला व हकूक	खतौनी नं. / लगान जो मुजारा अदा करता है व तफसील शरह व तदाद	नाम मालिक व एहवाल	नाम काश्तकार व एहवाल	नाम चाह व दीगर वसायल आबपाशी	नम्बर खसरा हाल	रकबा हर खेत व मिजान खाता मय किस्म अराजी मीट्रिक ईकाइयों में	हिस्सा या पैमाना हकीयत व तरीका बाछ	कैफियत
1	2	3	4	5	6	7	8	9
76 मिन / 75 / [illegible] (1) / 0.00 माल / 0.00 स्वाई	81 मिन / 80	कुल भाग (2) तिलक राज, अवतार सिंह पुत्र हाकम सिंह पुत्र अमी चन्द भाग बराबर (1) [illegible] चौधरी राम पुत्र [illegible] सिंह पुत्र अमी चन्द (1) भाग निवासी महाल कुठारबीत	कब्जा स्वयं		1174	00-42-47 बंजर कदीम	[illegible] (1)	475 [illegible] [illegible] सिंह पुत्र [illegible] इंतकाल दिनांक 15-07-2018 को [illegible] हो चुका है।

AMIT KUMAR LMK [illegible] ID: [illegible] 2018

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Jam04042210207

राजस्व विभाग, हिमाचल प्रदेश - नकल जमाबंदी

एस.सी.ए रसीद संख्या: 215812282403046[illegible]

ज़िला	: ऊना	नाम	: a
तहसील	: दुलैहड़ (उप-तहसील)	पिता/पति	: b
कानूनगोवृत	: दुलैहड़		
पटवार वृत	: कुठारबीत		
हदबस्त न.	: 524		

नकल शुल्क : 1
सेवा शुल्क : 10
कुल शुल्क : 11

मोहाल : जोड़ियां कुठारबीत साल : 2016-2017 रकबा ईकाई है-आ-मी

खेवट नं. / नाम पत्ती या तरफ मय नाम नम्बरदार / मुताबला व शरह मुआमला व हकूक	खतौनी नं. / लगान जो मुजारा अदा करता है व तफसील शरह व तदाद	नाम मालिक व एहवाल	नाम काश्तकार व एहवाल	नाम चाह व दीगर वसायल आबपाशी	नम्बर खसरा हाल	रकबा हर खेत व मिजान खाता मय किस्म अराजी मीट्रिक ईकाइयों में	हिस्सा या पैमाइश हकीयत व तरीका बाछ	कैफियत
1	2	3	4	5	6	7	8	9
76 मिन 25 [illegible] (1) 0.00 माल 0.00 स्वाई	81 मिन 80	कुल भाग (2) तिलक राज, अवतार सिंह पुत्र हाकम सिंह पुत्र अमी चन्द भाग बराबर (1) भाग चौधरी राम पुत्र [illegible] सिंह पुत्र अमी चन्द (1) भाग निजामी महाल कुठारबीत	कब्जा स्वयं		1196	00-25-44 बंजर कदीम	[illegible]	475 [illegible] [illegible] इन्तकाल दिनांक 20-07-2013 से स्वीकार हो चुका है।

AMIT KUMAR LMK [illegible] ID: 2197[illegible]0018

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Jam04042210209

राजस्व विभाग, हिमाचल प्रदेश - नकल जमाबंदी

एल.जी.ए. [illegible] 21581229240421 67
नाम : [illegible]
दिनांक : [illegible]

जिला	ऊना	नकल शुल्क 1.00
तहसील	दुलैहड़ (उप-तहसील)	डाटा शुल्क 10
कानूनगो वृत	दुलैहड़	कुल शुल्क 11
पटवार वृत	कुठारबीत	
हदबस्त नं.	524	

मोहाल : जौहिया कुठारबीत   साल : 2016-2017   रकबा इकाई: है-आर-मी

खेवट नं. नाम पत्ती या तरफ सब नाम लम्बरदार मुताबिक व शरह मुआमला व हबूब	खतौनी नं. लगान जो मुजारा अदा करता है व तफसील शरह व लदाद	नाम मालिक व पहचान	नाम काश्तकार व पहचान	नाम चाह व दीगर वसायल आबपाशी	रकबा नम्बर खसरा	रकबा हर खेत व किस्म ज़मीन मीट्रिक इकाइयों में	हिस्सा या पैमाना हकीयत व तरीका लगान	कैफियत
1	2	3	4	5	6	7	8	9
75 मिन 75 [illegible] (1) 0.00 जमा 0.06 रकबाई	81 मिन 80	[illegible] (2) [illegible] (1) [illegible] (1) भाग निवासी महाल कुठारबीत	कब्जा [illegible]		1197	00-02-11 बंजर कदीम	[illegible]	[illegible]

Certified that this copy has been generated from the database of Revenue Department at Central Server- HP as accessed by the Lok Mitra Kendra Amit Kumar on 07-June-2022

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For Validity Refer : Notfic. No:Rev-C(F)10-1/2009 Dated 14-Feb-2011

Jam04042210212

राजस्व विभाग, हिमाचल प्रदेश - नकल जमाबंदी

एल.ओ.ए रसीद संख्या: 215812302405487[illegible]

नाम : a

पिता/पति : b

नकल शुल्क : 1

सेवा शुल्क : 10

कुल शुल्क : 11

जिला : ऊना

तहसील : दुलैहड़ (उप-तहसील)

कानूनगोवृत : दुलैहड़

पटवार वृत : कुठारबीत

हदबस्त नं. : 524 मोहाल : ओड़िया कुठारबीत

साल : 2016-2017 रकबा ईकाई: है-आ-मी

खेवट नं. / नाम पत्ती या तरफ मय नाम नम्बरदार / मुताबला व शरह मुआमला व हबूब	खतौनी नं. / लगान जो मुजारा अदा करता है व तफसील शरह व तदाद	नाम मालिक व एहवाल	नाम काश्तकार व एहवाल	नाम चाह व टीवर तालाब आबपाशी	नम्बर खसरा हाल	रकबा हर खेत व मिजान खाता मय किस्म अराजी मीट्रिक ईकाइयों में	हिस्सा या पैमाना हकीयत व तरीका बाछ	कैफियत
1	2	3	4	5	6	7	8	9
76 मिन 75 खसरा खेवट नं. (1) 0.00 माल 0.00 [illegible]	81 मिन 80	कुल भाग (2) तिलक राज उत्तम सिंह पुत्र हाकम सिंह पुत्र श्री चन्द भाग बराबर (1) भाग [illegible] चन्द (1) भाग निवासी महाल कुठारबीत	कब्जा स्वयं		1156	00-27-46 बंजर कदीम	[illegible]	475 [illegible] [illegible] इंतकाल दिनांक 29.07.2015 को स्वीकार हो चुका है।

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Jam04042210214

राजस्व विभाग, हिमाचल प्रदेश - नकल जमाबंदी

जिला : ऊना
तहसील : दुलैहड़ (उप-तहसील)
कानूनगोवृत : दुलैहड़
पटवार वृत : कुठारबीत
हदबस्त न. : 524   मोहाल : जौड़ियां कुठारबीत   साल : 2016-2017   रकबा ईकाई: है-आ-मी

एस.सी.ए रसीद संख्या 2158123224065125
नाम : a
पिता/पति : b

नकल शुल्क : 1.00
सेवा शुल्क : 10
कुल शुल्क : 11

खेवट न. / नाम पत्ती या तरफ अव नाम नम्बरदार / मुताबिक व शरह मुआमला व हबूब	खतौनी न. / लगान जो मुजारा अदा करता है व तफसील शरह व तदाद	नाम मालिक व एहवाल	नाम काश्तकार व एहवाल	नाम चाह व दीगर वसायल आबपाशी	नम्बर खसरा हाल	रकबा हर खेत व मिजान खाता मय किस्म अराजी मीट्रिक ईकाइयों में	हिस्सा या पैमाना हकीयत व तरीका बाछ	कैफियत
1	2	3	4	5	6	7	8	9
76 मिन 75 रकबा खेवट व (1) 0.00 माल 0.00 इलाई	81 मिन 80	कुल भाग (2) तिलक राज, अवतार सिंह पुत्र हाकम सिंह पुत्र अमी चन्द भग बराबर (1) भाग [illegible] राम पुत्र [illegible] सिंह पुत्र अमी चन्द (1) भाग निवासी महाल कुठारबीत	कब्जा स्वय		1200	00-31-99 [illegible]	[illegible] खेवट न.(1)	475 [illegible]

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Jam04042210217

राजस्व विभाग, हिमाचल प्रदेश - नकल जमाबंदी

एल.एम.के रसीद संख्या: 215812362407[illegible]

जिला	: ऊना	नाम	: a	नकल शुल्क	: 1
तहसील	: दुलैहड़ (उप-तहसील)	पिता/पति	: b	सेवा शुल्क	: 10
कानूनगोवृत	: दुलैहड़			कुल शुल्क	: 11
पटवार वृत	: कुठारबीत				
हदबस्त न.	: 524	मोहाल	: जौड़ियां कुठारबीत	साल	: 2016-2017

रकबा ईकाई: है-आ-मी

खेवट नं. / नाम पत्ती या तरफ मय नाम नम्बरदार / मुतालबा व शरह मुआमला व हबूब	खतौनी न. / लगान जो मुजारा अदा करता है व तफसील शरह व तदाद	नाम मालिक व रहवास	नाम काश्तकार व रहवास	नाम चाह व टीमर वसायल आबपाशी	नम्बर खसरा हाल	रकबा हर खेत व मिजान खाता मय किस्म अराजी मीट्रिक ईकाइयों में	हिस्सा या पैमाना हकीयत व तरीका बाछ	कैफियत
1	2	3	4	5	6	7	8	9
76 मिन / 75 / [illegible] (1) / 0.00 माल / 0.00 त्वाई	81 मिन / 80	[illegible] (2) [illegible] (1) [illegible] (1) [illegible] निवासी महाल कुठारबीत	कब्जा स्वयं		1206	02-28-69 बंजर कदीम	[illegible] (1)	475 [illegible] 475 [illegible] [illegible] दिनांक 05-07-2018 को [illegible] हो चुका है।

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For Validity Refer : Notific. No.Rev-C(F)10-1/2009 Dated 14-Feb-2011

Jam04042210218

राजस्व विभाग, हिमाचल प्रदेश - नकल जमाबंदी

एम.डी.ए. रसीद [illegible] 2158123624096777

नाम : a

पिता/पति : b

नकल शुल्क	1.00
सेवा शुल्क	10
कुल शुल्क	11

जिला : ऊना

तहसील : दुलैहड़ (उप-तहसील)

कानूनगोवृत्त : दुलैहड़

पटवार वृत्त : कुठारबीत

हदबस्त नं. : 524

मोहाल : जौड़िया कुठारबीत

साल : 2016-2017

रकबा ईकाई है-आ-री

खेवट नं. / नाम पत्ती या तरफ मय आला नम्बरदार / मुताबला व शरह मुआमला व हबूब	खतौनी नं. / लगान जो मुजारा अदा करता है व तफसील शरह व तदाद	नाम मालिक व रहवाल	नाम काश्तकार व रहवाल	नाम चाह व दीगर वसायल आबपाशी	नम्बर खसरा [illegible]	रकबा हर खेत व मिजान खाता मय किस्म अराजी मीट्रिक ईकाइयों में	हिस्सा या पैमाना हकीयत व तरीका बाछ	कैफियत
1	2	3	4	5	6	7	8	9
70 [illegible] 75 [illegible] (1) 0.00 [illegible] 0.00 [illegible]	81 [illegible] 80	कुल भाग (2) [illegible] अवतार सिंह पुत्र हाकम सिंह पुत्र [illegible] भाग बराबर (1) भाग [illegible] राम पुत्र [illegible] सिंह पुत्र [illegible] (1) भाग निवासी महाल कुठारबीत	[illegible]		1226	[illegible] [illegible]	[illegible]	[illegible]

Certified that this copy has been generated from the database of Revenue Department at Central Server- HP as accessed by the Lok Mitra Kendra Amit Kumar on 07-June-2022

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Jam04042210222

राजस्व विभाग, हिमाचल प्रदेश - नकल जमाबंदी

एल.सी.ए रसीद संख्या: 2158124024110425

[illegible] : ऊना
तहसील : दुलैहड़ (उप-तहसील)
कानूनगोवृत : दुलैहड़
पटवार वृत : कुठारबीत
हदबस्त न. : 524

[illegible] : a
स्थिति : b

नकल शुल्क : 1
सेवा शुल्क : 10
कुल शुल्क : 11

मौहाल : औड़िआं कुठारबीत   साल : 2016-2017   रकबा हैक्टेयर में [illegible]

खेवट न. / नाम पत्ती या तरफ मय नाम नम्बरदार मुताबला व शरह मुआमला व हबूब	खतौनी न. / लगान जो मुजारा अदा करता है व तफसील शरह व तादाद	नाम मालिक व पहचान	नाम काश्तकार व पहचान	नाम चाह या टीका जमाबन्द आबपाशी	नम्बर खसरा हाल	रकबा हर खेत व मिजान वाला मय किस्म अराजी मीट्रिक ईकाइयों में	हिस्सा या पैमाना हकियत व तरीका बाछ	कैफियत
1	2	3	4	5	6	7	8	9
76 मिन 75 [illegible] (1) 0.00 माल 0.00 स्वाई	81 मिन 80	[illegible] (2) [illegible] (1) [illegible] (1) [illegible] कुठारबीत	कब्जा स्वंय		1227	05-11-73 [illegible]	[illegible]	425 [illegible]

AMIT KUMAR
LMK DULEHAR
ID: [illegible]2018

[illegible]
13/6/22

Certified that this copy has been generated from the database of Revenue Department at Central Server- HP as accessed by the Lok Mitra Kendra Amit Kumar on 07-June-2022

To Verify; enter the Copy No above Bar Code at https://himbhoomilmk.nic.in
For Validity Refer : Notific. No:Rev-C(F)10-1/2009 Dated 14-Feb-2011

Jam04042210223

राजस्व विभाग, हिमाचल प्रदेश - नकल जमाबंदी

जिला : ऊना
तहसील : दुलैहड़ (उप-तहसील)
कानूनगोवृत : दुलैहड़
पटवार वृत : कुठारबीत
हदबस्त नं. : 524
मौहाल : जोड़ियां कुठारबीत

एस.डी.ए. [illegible] : 2158123524127002
[illegible] : a
पिता/पति : b

नकल शुल्क : 1.00
सेवा शुल्क : 10
कुल शुल्क : 11

साल : 2016-2017
रकबा ईकाई : है-आर-मी

खेवट नं. / नाम पत्ती या तरफ मय नाम नम्बरदार मुताबिक व शरह मुआमला व हकूक	खतौनी नं. / लगान जो मुजारा अदा करता है व तफसील शरह व तदाद	नाम मालिक व एहवाल	नाम काश्तकार व एहवाल	नाम चाह व दीगर जराये आबपाशी	नम्बर खसरा हाल	रकबा हर खेत व किस्म आराजी मीट्रिक ईकाईयों में	हिस्सा या पैमाना हकीयत व तरीका बाछ	कैफियत
1	2	3	4	5	6	7	8	9
76 मिन / 25 [illegible] (1) 0.00 मालिया 0.00 लगान	81 मिन / 80	कुल भाग (2) तिलक राज, अवतार सिंह पुत्र तारका सिंह पुत्र अमी चन्द भाग बराबर (1) भाग चौधरी राम पुत्र [illegible] सिंह पुत्र अमी चन्द (1) भाग निवासी महाल कुठारबीत	कब्जा स्वयं		1206/1	0-54-49 बंजर कदीम	[illegible] खेवट 4 (1)	475 [illegible] [illegible]

AMIT KUMAR
LMK D[illegible]
ID- [illegible]

Certified that this copy has been generated from the database of Revenue Department at Central Server- HP as accessed by the Lok Mitra Kendra Amit Kumar on 07-June-2022

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Jam04042210224

ANNEXURE V

PERFORMA FOR THE JOINT INSPECTION OF THE AREA APPLIED FOR GRANT OF MINING LEASE.

1. General.

1.1 Name of the Applicant.		Sh. Lakhwinder Singh M/S Lakhwinder Singh Stone Crusher & Screening Plant Unit -I .
1.2 Address of the Applicant.	Father's Name.	
	Village.	Pollian Beet
	P.O	Pollian Beet
	Tehsil.	Haroli
	District.	Una
	Pin No.	
1.3 Approach and Location of the Area.	The applied for mining lease area is situated in Mauza /Mohal Kuthar Beet ,Tehsil Haroli Distt. Una and is approached through Link road / Kacha Road from village Janani Pllian Road Tehsil Haroli Distt. Una.	
1.4 Purpose for which lease is applied e.g. For setting up of stone crusher, Hollow block, Screening unit, free sale etc.	Already Established Stone Crusher in the name & style , M/S Lakhwinder Singh Stone Crusher & screening Plant Unit-I .	
1.5 Date of Joint Inspection.	06/01/2020	

1.6 Members Present During Joint Inspection.

Sr. No	Name and Designation	Particulars
1.	Sh. Gaurab Chaudary	S. D.O. (Civil) Haroli Distt. Una
2.	Sh.Mohit Bharti	J.E.Env. HPPCB Una
3.	Sh. Kamal Jit Singh	J.E. HPPWD Laluwal Distt. Una
4.	Sh. Balbag Rai	J.E. I & PH Duleharh Distt. Una
5.	Sh. Sandeep Kumar	D.R. O. Forest Deptt. Kungrat Distt. Una
6.	Sh.Kamal Dev	Field Kanogo Duleharh Distt.Una
7.	Sh. Abhishaik Kumar	Patwari Kuthar Beet Distt. Una
8.	Sh.Param Jit Singh	Mining Officer Una

Mining Officer
Distt. Una

2. Revenue Department

2.1 Status w.r.t. Demarcation of Applied For Area .

2.2 Detail of Area applied

Khasra No.	Area		Owner Govt/ private	Kism	Mohal	Mauza	Panchayat	Any other
	Kanals	HECT.						
1165		00-03-09	Pvt..Land	Banjar Kadeem	Jorrian Kuthar Beet	Kuthar Beet	Kuthar Beet	--
1166		00-00-54	Pvt..Land	Banjar Kadeem	Jorrian Kuthar Beet	Kuthar Beet	Kuthar Beet	
1169		00-01-08	Pvt..Land	Banjar Kadeem	Jorrian Kuthar Beet	Kuthar Beet	Kuthar Beet	
1173		01-00-16	Pvt..Land	Banjar Kadeem	Jorrian Kuthar Beet	Kuthar Beet	Kuthar Beet	
1174		00-42-47	Pvt..Land	Banjar Kadeem	Jorrian Kuthar Beet	Kuthar Beet	Kuthar Beet	
1196		00-25-44	Pvt..Land	Banjar Kadeem	Jorrian Kuthar Beet	Kuthar Beet	Kuthar Beet	
1197		00-02-71	Pvt..Land	Banjar Kadeem	Jorrian Kuthar Beet	Kuthar Beet	Kuthar Beet	
1198		00-27-46	Pvt..Land	Banjar Kadeem	Jorrian Kuthar Beet	Kuthar Beet	Kuthar Beet	
1200		00-31-99	Pvt..Land	Banjar Kadeem	Jorrian Kuthar Beet	Kuthar Beet	Kuthar Beet	
1206		02-28-69	Pvt..Land	Banjar Kadeem	Jorrian Kuthar Beet	Kuthar Beet	Kuthar Beet	
1206/1		00-94-49	Pvt..Land	Banjar Kadeem	Jorrian Kuthar Beet	Kuthar Beet	Kuthar Beet	
1226		01-51-50	Pvt..Land	Banjar Kadeem	Jorrian Kuthar Beet	Kuthar Beet	Kuthar Beet	
1227		00-11-73	Pvt..Land	Banjar Kadeem	Jorrian Kuthar Beet	Kuthar Beet	Kuthar Beet	
Total		07-21-35	Hecters	Banjar Kadeem	Jorrian Kuthar Beet	Kuthar Beet	Kuthar Beet	

Dulekar

06/01/2020

6/1/2020

Point of public utility in the area/near by (Village footpath, road, school, residential house, hospital, cattle shed, charitable building, water channel, cemetery/cremation ground, place of worship etc.

2.3 Consent of Gram Panchayat.

Gram Panchyat Kuthar Beet Block Haroli Distt.Una has already issued NOC in favour of applicant vide resolution No. 08 Dated 31/08/2017.

2.4 Whether marked on location plan attached with application If not then please mark [Any special recommendation with respect to above points]

Yes

2.5 Any other observation/condition .

The area was shown by Halqa patwari Village ~~Tatehra~~ Kuthar Beet . As entries of revenue record the area under question , applied for grant of mining lease is designated as Private land and kism is Banjar Kadeem and the area under reference is a Hill Slope.

Dulchar

06/01/2020

3. Forest Department	
3.1 Types of land i.e Reserve Forest/Protected Forest/ Demarcated Forest/ Non Forest Government Land/ Private Land etc.	Private Land
3.2 Whether attract FCA, 1980	N.A
If yes, then specify Kh. No's which attract FCA	

3.3 Whether there is any activity of the forest department in the area such as soil conservation works, nursery plantation, check dams, taming of nallas/stream etc ,if yes please specify and mark on location plan and what precautions are required.

N.A

3.4 Whether there is any property of Forest Department nearby which may have direct effect if mining is allowed.

N.A

3.5 Any other observation/condition.

Range Officer
Forest Range
Una H.P.-174303

Mining Officer
Distt. Una

4. PWD Department				
4.1 Whether any road exist near by area applied for mining lease				N.A
If Yes then	Type of road	Distance from area	Marked on location plan as	Minimum safe distance required for mining
	NH	NA		
	State highway	NA		
	Link road	2 Km		
	Village road			
4.2 Whether any road exist within area				
	Type of road	Distance from area	Marked on location plan as	Minimum safe distance required for mining
	NH	NA		
	State highway	NA		
	Link road	NA		
	Village road	NA		
4.3 Whether there exist any bridge, culvert etc within area/near area				
If yes, then No. of bridges etc.				
Whether marked on location plan				If not, please mark
	Bridge	Minimum distance required		Any special precaution required
		U/S	D/S	
	Bridge No.1	NA	NA	
	Bridge No.2	NA	NA	

4.4 Any other structure of PWD importance, if yes (Please mark on location plan) then specify any special precaution.

4.5 Any other observation/condition

4.6 Is there any objection if intake point from PWD road to the leased area is used in case lease is grant. If not, whether to allow with conditions .

Kamal Sah
J.E
P.W.D

Assistant Engineer,
Tahilwara Sub Division
H.P.P.W.D. (R&B) Mandi

Mining Officer
Distt. Una

5. IPH Department			
5.1 Whether there exist any water supply scheme within/near the area		No	
Type of Scheme	Scheme	Minimum safe distance required	
		U/S	D/S
	Water supply tank	—	—
	Water supply bore well	—	—
	Lift Irrigation Scheme	—	—
	Hand Pump	—	—
Whether marked on location plan	—	If not please mark	
Any special recommendation with respect to above schemes On this			
5.2 Any other important point with respect to IPH department, if yes. Please mark on location plan. Whether any special precaution is required , please specify			
5.3 Any other observation/condition			

Junior Engineer,
IPH Section Dulehar

Assistant Engineer
I.& P.H. Sub Division,
Tahliwal,Distt. Una (H.P.)

Mining Officer
Distt. Una

6. Industries Department	
6.1 Location of Applied For Area (nearest village/important features)	The applied for mining lease area is a Hill Slope (Private Land) and located in Mohal Jorrian Kuthar Beet Tehsil Haroli Distt. Una and is approachable from Janani –Pollian road from village Janani to lease area by pakka/ kacha road .
6.2 Purpose of Mining Lease.	For feeding Already established Stone Crusher In the name and style M/S Lakhwinder Singh Stone Crusher & Screening Plant Unit -I in village & PO Pollian Beet Tehsil Haroli Distt. Una .
6.3 Overlapping of areas with any other lease/contract	No
If yes please give detail	NA
6.4 Location of the nearest mining area/quarry	NA
6.5 Average daily production anticipated in Metric Tonns	500 MT (Approximately)
If Yes, please mark on location plan and suggest precaution	---
6.6 *Suitability* of mineral as per the purpose given above (Give detail)	The applied for mining lease area is a Hill Slope and comprised of boulders, cobbles and pebbles With sand/ clay matrix and is suitable to be used in stone crusher unit.

Mining Officer
Distt. Una

6.7 **Feasibility of Mining**	
(i) **Name of Mineral :**	Stone , Bajri and clay .
(ii) **Type of mining Hill slope/River Bed:**	Hill Slope
(A) Hill Slope	
(i) **Average angle of slope:**	Gentle
(ii) **Nature of rock:**	The deposits in the lease area are alluvial deposits Which contains mixture of boulders, pebbles and silt mix sand .The extraction of minerals shall involve terrace type mining.
(iii) **Scientific mineability considering the Orientation of revenue record:**	The area is compact hill slope contains mixture of boulders, pebbles and silt mix sand acts as cementing material .There is no possibility of land slide by making benches of 4 meters height.
(iv) **Availability of mineral w.r.t anticipated production:**	Sufficient minerals are available to meet out the requirement of the stone crusher unit.
(v) **Availability of area for disposal of waste:**	Sufficient area is available for disposal of clay/silt
(vi) **Approach to the Mine area:**	The lease area is a Hill slope and there is no traffic from mining lease area to Janani Road. The vehicles may pass through private as well as Govt. Land. The project proponent shall made necessary arrangements between land owners (Private/ Govt.) and will take care of other issues if any by his own for the minerals transportation .
(vii) **Whether areas is prone to land slide if yes then the protection measures needed thereof:**	-- NA.
(B) River Bed	
(i) **Name of river/ streams:**	---
(ii) **Width of river bed:**	---

Mining Officer

(c) Additional information on case of renewal of Mining Lease

(i) Report under Rule 18(2)of Himachal Pradesh Minor Mineral rule:

(i) Investment for developing the area — NA

(ii) Investment on machinery & equipment

(iii) Laborer Employed — —

(ii) Production of mineral for the last tenure:

(iii) Violation of condition mining noticed in the tenure — NA

(iv) Detailed note on scientific mining w.r.t Mining Plan in the last tenure

6.8 Whether mining can pose threat to existing object of Public Utility or private property? If any, Give detail and precaution required.

NA

If no, the reason thereof:

Mining Officer
Distt. Una

6.9 Any other special point pertaining to Industries Department.

1.The area applied for mining lease for stone crusher is hill slope (Private Land) comprising Kh. No. 1165,1166,1169,1173,1174,1196,1197,1198,1200,1206,1206/1,1226 & 1227 measuring an area 07-21-35 hecters which is situated in Mauza Kuthar Beet Tehsil Haroli Distt. Una .

2. Area applied for mining lease having good deposits of boulders cobbles and pebbles and silt mixed with sand to meet out the requirement of a stone crusher unit.

3. The applicant will plan the mining activities in such a manner that no mass wasting activities get triggered in and around the lease area.

4. During the course of inspection it was observed by the committee that the area applied for mining lease is found suitable for the purpose applied for.

5. The mining lease area is a hill slope and there is no traffic from Una –Gagret road to mining lease area but there is normal traffic from Una –Janani road to stone crusher unit which is about one kilometer and as such the mining lease area is at a distance of 2.5 to 3 kilometers from the stone crusher unit . For the transportation created during the operation of mining lease, vehicles may passed through the private as well as Govt. land , the project proponent made necessary arrangements between land (Private/Govt.) owners and will take care of other issues if any by his own for the minerals transportation .

6. All the provisions contained in Himachal Pradesh Minor Minerals (Concession) and Minerals (Prevention of Illegal Mining ,Transportation and Storage) Rules 2015,and any other instructions issued by department time to time with respect to mining activities in the lease area will be bindings on the applicant.

7. As per the revenue record kism of applied for mining lease area is khareter and is Private Land .

8. The applicant will start mining operations in the lease area after obtaining EIA clearance from the competent authority.

Mining Officer
Distt. Una

7. HP State Pollution Control Board

Summary of method for Environment Protection

The site of applied mining lease for already established stone crusher in the name of M/S Lakhwinder Singh stone crusher and Screening Plant (Unit-I) was inspected on dated 06/01/2020.The applied mining lease by Sh. Lakhwinder Singh , S/o Sh. Jagmail Singh , H. No. 1238, Sector 90, Mohali for minor minerals. The Area of mining lease mention as given below.

Sr. No.	Area (Hect.)	Khasra No.	Owner Govt./Pvt Land	Panchayat	Mohal	Muzza	Kism
1.	00-03-09	1165	Pvt. Land	Kuthar Beet	Jorrian Kuthar Beet	Kuthar Beet	Banjar Kadeem
2.	00-00-54	1166	Pvt.Land	Kuthar Beet	Jorrian Kuthar Beet	Kuthar Beet	Banjar Kadeem
3.	00-01-08	1169	Pvt.Land	Kuthar Beet	Jorrian Kuthar Beet	Kuthar Beet	Banjar Kadeem
4.	01-00-16	1173	Pvt.Land	Kuthar Beet	Jorrian Kuthar Beet	Kuthar Beet	Banjar Kadeem
5.	00-42-47	1174	Pvt.Land	Kuthar Beet	Jorrian Kuthar Beet	Kuthar Beet	Banjar Kadeem
6.	00-25-44	1196	Pvt.Land	Kuthar Beet	Jorrian Kuthar Beet	Kuthar Beet	Banjar Kadeem
7.	00-02-71	1197	Pvt.Land	Kuthar Beet	Jorrian Kuthar Beet	Kuthar Beet	Banjar Kadeem
8.	00-27-46	1198	Pvt.Land	Kuthar Beet	Jorrian Kuthar Beet	Kuthar Beet	Banjar Kadeem
9.	00-31-99	1200	Pvt.Land	Kuthar Beet	Jorrian Kuthar Beet	Kuthar Beet	Banjar Kadeem
10.	02-28-69	1206	Pvt.Land	Kuthar Beet	Jorrian Kuthar Beet	Kuthar Beet	Banjar Kadeem
11.	00-94-49	1206/1	Pvt.Land	Kuthar Beet	Jorrian Kuthar Beet	Kuthar Beet	Banjar Kadeem
12.	01-51-50	1226	Pvt.Land	Kuthar Beet	Jorrian Kuthar Beet	Kuthar Beet	Banjar Kadeem
13.	00-11-73	1227	Pvt.Land	Kuthar Beet	Jorrian Kuthar Beet	Kuthar Beet	Banjar Kadeem
Total Area	07-21-35 Hect. (Mauza Kuthar Beet & Mohal Jorrian Kuthar Beet)						

The mining lease may be issued to the proponent for sale of minor minerals as per the mining policy of the Govt. of (H.P) along with the following term & condition please.

- The Mining shall be carried out as per the practices and policies of mining departments.
- The mining lease area is Hill Slope mining area falling in Mauza/Mohal Kuthar Beet , Tehsil Haroli,Distt. Una, So the stone, Bajri & Clay should be picked up as per mining policy.
- No blasting shall be carried out.
- Natural course of river shall not be disturbed & especially step shall be taken to control the soil erosion.
- Any guidelines issued by State Pollution Control Board Shall be binding.
- The Proponent shall obtain the Env. Clearance from the competent authority as per the orders of Hon'ble supreme court dt. 27.02.2012 & Hon'ble High Court dt. 15.06.2012 & 14.09.2012. The proponent shall not carry out any mining activity till EC obtained from the competent authority.
- Water sprinkling shall be carrying out on approach road during transport the material from mining area

Jr. Env. Engr.
HPSPCB, Una
Distt. Una (H.P.)

2

8. Recommendations	
8.1 Whether whole of the Area is being recommended for Mining.	Yes
If no, please specify the Khasra. No's. being recommended .	
Any other recommendation in addition to recommendations given at to No	
Final recommondation of the Committee Keeping the facts given in the report , the mining lease area applied by Sh.Lakhwinder Singh of M/S Lakhwinder Singh Stone Crusher & Screening Plant Unit-I Village P.O. Pollian Beet Tehsil Haroli Distt.Una over Khasra Number 1165,1166,1169,1173,1174,1196,1197,1198,1200,1206, 1206/1,1226 & 1227 measuring an area 07-21-35 hecters. for already established stone crusher unit is recommended by the committee for grant of mining lease in favour of the applicant after getting the necessary environment clearance from thr competent authority.	

Signatures		
SDO(C) Sub Division Officer (C) HAROLI,Distt.Una (H.P.)	ACF/R.O. Range Officer Forest Range Una H.P.-174303	Repersentative of P.W.D. Assistant Engineer, Tahliwala Sub.Division H.P.P.W.D./B&R)Haroli
Repersentative of IPH Assistant Engineer I.& P.H. Sub Division, Tahliwal,Distt. Una (H.P.)	Repersentative of H.P.P.C.B. Jr. Env. Engg. HPSPCB, Una Distt. Una (H.P.)	Mining Officer Mining Officer Distt. Una

ANNEXURE VI

REGISTERED

No. Udyog-Bhu(Khani-4)Laghu-855/2020 - 9271
Government of Himachal Pradesh
Department of Industries
"Geological Wing"
Dated: Shimla- 171001, 31-1-2022

To

Sh. Lakhwinder Singh,
S/o Sh. Jagmail Singh,
HIG-824, Phase-II, Mohali, Punjab.

Subject:- **Approval of Mining Plan of area applied for grant of mining lease for collection/extraction of sand, stone & bajri from Khasra Nos. 1165, 1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227 over an area measuring 07-21-35 Hects.(Pvt. land, Hill slope) falling in Mauza Kuthar Beet, Mohal Jodian Kuthar Beet of Tehsil Haroli, District Una, H. P. for which Letter of Intent has been issued on 27.8.2021.**

Dear Sir,

In exercise of powers conferred by Rule 36 of Himachal Pradesh Minor Mineral (Concession) and Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules 2015, I hereby approve the above said Mining Plan for the purpose of obtaining Environment Clearance of the area applied for grant of mining lease for which the letter of intent has been issued on 27.8.2021. The mining plan is approved for a period of five years from the date of execution of mining lease deed. This approval is subject to the following conditions.--

1. That the Mining Plan is approved without prejudice to any other laws applicable to the mine/area from time to time whether made by the Central/State govt. or any other authority.
2. That this approval of the Mining Plan does not in any way imply the approval of Govt. in terms of any other provisions of the H. P. Minor Minerals (Concession) Revised Rules, 1971 now repealed as Himachal Pradesh Minor Mineral (Concession) and Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules 2015 or any other laws including Forest (Conservation) Act, 1980, Environment Protection Act, 1986 and the rules made there under and other relevant statutes, orders and guidelines as may be applicable to lease area from time to time.
3. That the Mining Plan is approved without prejudice to any orders or directions from any Court of competent jurisdiction.
4. That in case State Geologist, Geologist, any other inspecting officer/official of Geological Wing Department of Industries, after field inspection notices that proposals made and workings shown in the mining lease by the RQP need certain corrections/ amendments due to change in conditions either natural or man made, the inspecting officer can recommend necessary amendments in the Mining Plan at any point of time in the interest of environment and mineral conservation.
5. That the lease holder shall procure Environment clearance from the competent authority as per Environmental Impact Assessment notification, 2006 and amendements/notifications issued time to time in this regard.
6. That the approval of proposed mining operations is restricted to the mining lease area only.
7. That in case additional conditions are imposed by the Ministry of Environment & Forests Govt. of India while according clearance under EIA notification dated 14.9.2006 and any condition imposed by the State

Govt. while granting mining lease the same shall have to be incorporated by making necessary amendments in the Mining Plan by the lessee through R. Q. P.

8. That in case Mining lease is not renewed or is terminated or working is suspended before the expiry of the lease period due to any reason, the approval of Mining Plan shall stand automatically cancelled.
9. That the lease holder shall carry out production of mineral in accordance to the production shown in Mining Plan and Environmental Clearance which ever is less.
10. That no person shall undertake mining operations in any mining lease area, except in accordance with a Mining Plan approved under sub rule (2) of Rule 39 of Himachal Pradesh Minor Mineral (Concession) and Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules 2015.
11. That the lease holder shall carry out working in the mining lease area as per Mining Plan only after obtaining permission to work in the mining lease area from the competent authority.
12. That if the mining operations are not carried out in accordance with the approved Mining Plan the State Geologist, Geologist, Assistant Geologist and the Mining Officer, may order suspension of all or any of the mining operations and permit continuation of only such operations as may be necessary to restore the conditions in the mine as envisaged under the said Mining Plan.
13. That if any thing is found to be concealed as required under various Rules and guidelines pertaining to mining in the context of the Mining Plan and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.
14. That in case of any violation of terms and conditions of the approved Mining Plan, the financial assurance deposited by the said lessee shall be liable to forfeited.

Enclosed - Copy of approved Mining Plan.

Yours faithfully,

State Geologist
Himachal Pradesh
Dated: 2021

Endst. No. As above
Copy for kind information to:-

1. The Mining Officer, Una, Distt. Una, H. P. alongwith a copy of Mining Plan for further necessary action.
2. Sh. Arun Dhiman, Village & P. O. Dhaloon(Panchpuli), Tehsil Nagrota Bagwan, Distrit Kangra, H. P.-176056.

State Geologist
Himachal Pradesh

MINING PLAN

HILL SLOPE

AREA – 07-21-35 HECTARES (PVT. LAND)
KHASRA NOS. – 1165 ,1166, 1169, 1173, 1174, 1196,
1197, 1198, 1200, 1206, 1206/1, 1226 & 1227

MINERAL – MAUZA KUTHARBEET, MOHAL JORRIAN KUTHARBEET, TEHSIL HAROLI, DISTRICT UNA, HIMACHAL PRADESH, HIMACHAL PRADESH

APPLICANT	PREPARED BY
Sh. Lakhwinder Singh	Arun Dhiman
Prop:- M/s Lakhwinder Singh Stone	Vill. & P.O. Dhaloon,
Crusher and Screening Plant Unit-I,	Tehsil Nagrota Bagwan
Vill. & P.O. Polianbeet, Tehsil Haroli,	Distt Kangra (HP) 176056
District Una, Himachal Pradesh	(R.Q.P. No. H.P./ RQP/25/2/2019)

INDEX

SALIENT FEATURES OF THE LEASE AREA FOR MINING OF STONE

1	Project		Mining Project
2	Name of Mineral		Stone, Bajri and Sand
3	Application No. (IUID)		
4	Letter of Intent		Udyog-Bhu- (Khani-4)Laghu-91/2021-5643 dated 06/10/2021
5	Applicant Address		Sh. Lakhwinder Singh Prop:- M/s Lakhwinder Singh Stone Crusher and Screening Plant Unit-I, Vill. & P.O. Polianbeet, Tehsil Haroli, District Una, Himachal Pradesh.
6	Location of Mine	Village	Kutharbeet
		Mauza & Mohal	Kutharbeet
		Khasra Nos.	1165 ,1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227
		Land Type	Private land
		Panchyat	Kutharbeet
		District	Una
		State	Himachal Pradesh
7	Type of Area applied		Hill Slope
8	Total Area		07-21-35 Hects.
9	Total Minable area		07-21-35 Hects.
10	Mineable Quantity		Approx. 350000 MTPA
11	Coordinates of Area		31°23'51.47"N 76°10'22.51"E 31°23'28.28"N 76°10'38.01"E
12	Elevations	Highest	558
		Lowest	508
13	Average width of River at Lease area		NA
14	Period of mining Lease Area		As per Lollagant orders
15	Ultimate Pit Limit		508m
16	Method of Mining		Mechanical
17	No. of Working Days		300
18	End use of mineral		For manufacturing of Grit
19	Manpower requirement		25-30 persons
20	Distances (In Kms)	Mining Office Una	20.00 kms
		Shimla	170.00 kms
		Haroli	10.00 kms
		Chandigarh	130.00 kms
		Giripul	26.00 kms

MINING PLAN

(INCLUDING PROGRESSIVE MINE CLOSURE PLAN)

OF

APPLIED MINING LEASE AREA IN

HILL SLOPE

TOTAL AREA - 07-21-35 HECTARES

KHASRA NOS. – 1165 ,1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227 (PRIVATE LAND)

FOR

EXTRACTION OF MINOR MINERAL

SAND, STONE AND BAJRI

FROM

MAUZA AND MOHAL KUTHARBEET TEHSIL HAROLI,

DISTRICT UNA, HIMACHAL PRADESH

PREPARED AND SUBMITTED UNDER

UNDER HIMACHAL PRADESH MINOR MINERALS (CONCESSION) AND MINERALS (PREVENTION OF ILLEGAL MINING, TRANSPORTATION AND STORAGE) RULES, 2015

PREPARED BY

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भौमिकीय शाखा
उद्योग विभाग शिमला
Geological wing
Deptt. of Industries
Shimla
APPROVED
With Condition
शर्तों के साथ अनुमोदित
Vide Letter No. Udyog-Bhu(Khani-4)Laghu-855/2020 - 9271
Dated 3/11/22
शिमला

State Geologist,
Himachal Pradesh

INTRODUCTION: -

Sh. Lakhwinder Singh Prop:- M/s Lakhwinder Singh Stone Crusher and Screening Plant Unit-I, Vill. & P.O. Polianbeet, Tehsil Haroli, District Una, Himachal Pradesh, has identified and applied an area (Hill slope) for the grant of mining lease for the extraction/collection of Stone, Bajri and Sand for Manufacturing Grit. The area applied for mining lease is situated near Village Kutharbeet, Tehsil Haroli District Una, Himachal Pradesh. The applicant submitted the case of mining lease to the department of Industries through online portal vide **IUID no.** 5611532 8 . The case was further referred to the District Joint Inspection Committee for inspection of the said site. Based on the observations and recommendations made by the Joint Inspection Committee, the case was referred to the Govt. for the approval to grant letter of intent (LoI) in favour of the applicant. The Govt. vide letter no. Ind-II(F)6-7/2015 dated 13.08.2021 conveyed the approval for the issuance of letter of intent (LoI) in favour of the applicant. Accordingly, the department has issued letter of Intent (LoI) in favour of the applicant vide letter No Udyog-Bhu(Khani-4)Laghu-855/2020-4198 dated 27-08-2021 for the provisional grant of applied area for mining situated in Khasra Nos. 1165 (00-03-09 Hect.), 1166 (00-00-54 Hect.), 1169 (00-01-08 Hect.), 1173 (01-80-16 Hect.), 1174 (00-42-47 Hect.), 1196 (00-25-44 Hect.), 1197 (00-02-71 Hect.), 1198 (00-27-46 Hect.), 1200 (00-31-99 Hect.), 1206 (02-28-69 Hect.), 1206/1 (00-94-49 Hect.), 1226 (01-51-50 Hect.) & 1227 (00-11-73 Hect.) (Private Land) total measuring 07-21-35 Hectares (Hill Slope) in Mauza Kutharbeet, Mohal Jorrian Kutharbeet, Tehsil Haroli, District Una, Himachal Pradesh for extraction of Sand, Stone and Bajri for Manufacturing of Grit to be used in the already established Stone Crusher unit of the applicant in the name and style as "**M/s Lakhwinder Singh Stone Crusher and Screening Plant Unit-I**" in favour of Sh. Lakhwinder Singh Prop: - M/s Lakhwinder Singh Stone Crusher and Screening Plant Unit-I, Vill. & P.O. Polianbeet, Tehsil Haroli, District Una, Himachal Pradesh with following conditions: -

1. The party shall get the area demarcated from the revenue authorities and shall erect permanent boundary pillars to the satisfaction of the Mining Officer so as to clearly depict the provisional granted area. A copy of the demarcation report shall also be submitted to the Mining Officer.
2. ***The party shall have to submit the approved Mining Plan under Rule 35 of Himachal Pradesh Minor Minerals (Concession) and Minerals (Prevention of Illegal Mining Transportation and Storage) Rules, 2015.***
3. The party shall have to obtain Environment Clearance under the provisions of Environment Protection Act, 1986 from the competent authority and Forest Clearance in case of Forest land.
4. The letter of intent is subject to any order passed by Hon'ble Supreme Court of India/High Court of Himachal Pradesh/National Green Tribunal or any other court/ concerned Department from time in this regard. This letter of intent is valid only for obtaining EIA clearance from the competent Authority as mandate by the Hon'ble Supreme court in its order dated 27.02.2012

In order to fulfil the requirement of condition No. 2 of the letter of Intent. The applicant approached the undersigned having R.Q.P. No. H.P./R.Q.P/25/2/2019 for the preparation of Mining Plan. The Mining Plan of the area has been prepared as per the format circulated (Form-M) by the State Geologist Himachal Pradesh and in accordance with the various provisions made in the Himachal Pradesh Minor Minerals (Concession) and Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules, 2015.

The area applied for mining lease is located in the form of hill slope. On the request of the said lessee to prepare the Mining Plan, the mapping of the applied mining lease area was carried out encompassing Topographical, Lithological and other features. The Mining Plan includes the systematic and scientific exploitation of minor mineral from within the applied lease area encompassing a phased program for afforestation and point of public utility.

1. GENERAL

1.1 NAME AND ADDRESS OF THE APPLICANT

1.1. A NAME OF THE APPLICANT	Sh. Lakhwinder Singh Prop:- M/s Lakhwinder Singh Stone Crusher and Screening Plant Unit-I
1.1.B ADDRESS OF THE APPLICANT	Vill. & P.O. Polianbeet, Tehsil Haroli, District Una, Himachal Pradesh
1.2 STATUS OF THE APPLICANT	Individual

1.3 MINERAL WHICH THE APPLICANT INTENDS TO MINE

The Applicant intends to mine Sand Stone and Bajri from the applied lease area. The minor minerals extracted from the applied area shall be used in the already established Stone Crusher unit in the name and style as "**M/s Lakhwinder Singh Stone Crusher and Screening Plant Unit-I**" for Manufacturing of Grit and manufactured Sand (M-Sand).

1.4 PERIOD FOR WHICH THE MINING LEASE IS TO BE GRANTED

Applied for a period of 15 years however, to be decided at the time of grant of mining leases as per the provisions of Himachal Pradesh Minor Minerals (Concession) and Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules 2015.

1.5 NAME AND ADDRESS OF H.P.R.Q.P. PREPARING THE WORKING PLAN

Arun Dhiman,
S/o Sh. Jagan Nath
R/o Village & P.O. Dhaloon (Panchpuli),
Tehsil Nagrota Bagwan, Distt. Kangra,
Himachal Pradesh-176056

Contact No. 9816579485
RQP No. H.P./R.Q.P./25/2/2019
Valid up to 24-09-2024

Surveyed By: Sh. C P Negi (Retired Surveyor)
Geological Wing (Department of Industries)

1.6 NAME OF PROSPECTING AGENCY.

The area has been discovered by the applicant and further investigated by the R.Q.P. The site was visited along with the project proponent for identification of the site based on the demarcation conducted by the revenue department in the presence of project proponent. The surface mapping of the area has been conducted by the surveyor using survey instruments and for carrying out prospecting of the mineral deposit, the preliminary information regarding Geological set up and occurrence of minerals in the area applied for mining lease and in its surroundings has been gathered from the previous work done by the Geological Survey of India and State Government agencies from time to time.

2. LOCATION AND APPROACH TO THE AREA (PLATE –1).

(Location Map enclosed as Plate No. – I)

2.1 TOPO-SHEET NUMBER H43E3

Pillar No	Latitude	Longitude
P1	31°23'51.47"N	76°10'22.51"E
P2	31°23'47.78"N	76°10'18.35"E
P3	31°23'48.23"N	76°10'23.09"E
P4	31°23'40.34"N	76°10'22.58"E
P5	31°23'36.37"N	76°10'27.67"E
P6	31°23'37.24"N	76°10'30.78"E
P7	31°23'29.23"N	76°10'32.01"E
P8	31°23'33.00"N	76°10'36.59"E
P9	31°23'37.18"N	76°10'33.50"E
P10	31°23'40.16"N	76°10'28.81"E
P11	31°23'40.57"N	76°10'31.95"E
P12	31°23'46.06"N	76°10'28.97"E
P13	31°23'46.42"N	76°10'26.67"E
P14	31°23'50.45"N	76°10'26.84"E

(Image (2D) Showing topography around Lease area

2.2 DETAIL OF THE AREA: -

Table Showing Details of the Area

Khasra Nos.	Owner	Kism	Mauza	Area (In Hects.)	Name of the Panchayat
1165	Private land	Banjar Kadeem	Kutharbeet	00-03-09	Kutharbeet
1166	Private land	Banjar Kadeem	Kutharbeet	00-00-54	Kutharbeet
1169	Private land	Banjar Kadeem	Kutharbeet	00-01-08	Kutharbeet
1173	Private land	Banjar Kadeem	Kutharbeet	01-00-16	Kutharbeet
1174	Private land	Banjar Kadeem	Kutharbeet	00-42-47	Kutharbeet
1196	Private land	Banjar Kadeem	Kutharbeet	00-25-44	Kutharbeet
1197	Private land	Banjar Kadeem	Kutharbeet	00-02-71	Kutharbeet
1198	Private land	Banjar Kadeem	Kutharbeet	00-27-46	Kutharbeet
1200	Private land	Banjar Kadeem	Kutharbeet	00-31-99	Kutharbeet
1206	Private land	Banjar Kadeem	Kutharbeet	02-28-69	Kutharbeet
1206/1	Private land	Banjar Kadeem	Kutharbeet	00-94-49	Kutharbeet
1226	Private land	Banjar Kadeem	Kutharbeet	01-51-50	Kutharbeet
1227	Private land	Banjar Kadeem	Kutharbeet	00-11-73	
TOTAL			**07-21-35 Hects. (72135 Sq. m.)**		

2.3 (A) ADDRESS DETAILS

Village	Kutharbeet
Patwar Circle	Dulehar
Post Office	Saisowal
Tehsil	Haroli
District	Una

2.3 (B) NEAREST DEPARTMENTS

Sub- Divisional Officer (Civil)	Haroli
Divisional Forest Officer	Una
Sub-Division (IPH)	Tahliwal
Sub-Division (PWD)	Tahliwal
Forest Range Officer	Una
Mining Officer	Una

2.4 DISTANCES FROM IMPORTANT PLACES IN KILOMETRES

Una	20.00	Kms.
Haroli	10.00	Kms.
Amb	50.00	Kms.
Shimla	170.0	Kms.
Chandigarh	130.0	Kms.

2.5 APPROACH OF THE AREA: -

The proposed mining site is located in the form of Hill Slope near village Kutharbeet. The site is approachable through Janani- Polian Road at a distance of approximately 4.50 Kms. from Polian. The site is at a distance of approximately 15.00 kilometres from the nearest major town Haroli. The highest point of applied mining lease area is 558 meters above MSL and lowest point is 508 meters above MSL.

Map Showing approach of the area

3. PHYSIOGRAPHIC ASPECTS OF THE AREA

3.1 GENERAL

Una is a district of Himachal Pradesh which lies in its south western part. On the 1st September, 1972 the Himachal Pradesh Govt. reorganised the then Kangra district into three districts namely Una, Hamirpur and Kangra. Una district is well developed in the industrial sector due to close proximity to Punjab. Mehatpur, Gagret, Tahliwal & Amb are main industrial centres of Una. On 11th January 1991, Una has been provided with railway line by laying 14 Kms broad gauge track from Nangal (Punjab) to Una.

The configuration of district is mostly hilly district and falls in the Himalayan foot- hill zone popularly known as Siwalik foot hills. There are many important hill ranges /Dhars in the district. Prominent among them are Sola Singhi Dhar or Jaswan Dhar, Chaumukhi Dhar, Dhionsar Dhar, Ramgarh Ki Dhar and Bangar Ki Dhar and all are stretching on the eastern part of the district. These Dhars run in the district from north-west to south-east direction. Area adjoining Punjab border is also hilly. Eastern part of this district is relatively higher than that of western part. The elevation of this district varies between 332 metres and 1,162 metres above the mean sea level. Soan river is the main river in the district which flows from north-west to south-east direction. Many tributaries like Borewali khad, Barerakhad, Garni khad, Panjoa khad, Ambwali khad, Badowali khad and Hum khad

etc., join it in the district from right and left sides. Soan river and its tributaries form a valley in the district known as Soan valley which is flat and most fertile. It is a seasonal river and becomes itself a tributary of Satluj river outside the district. In eastern part of the district, Lunkhar khad is another khad which flows in the south-easterly direction and merges with Satluj river. It also forms a narrow valley which is relatively flat and fertile.

In general the area is a part of Siwalik range .The Siwalik Hills are located within the political boundaries of Pakistan, India, Nepal, and Bhutan, and range between 6 to 90 km in width. They gradually become steeper and narrower in relief and width respectively, from northern Pakistan to

Bhutan (over 2000 km in length). Ongoing erosion and tectonic activities have greatly affected the topography of the Siwaliks. Their present-day morphology is comprised of hogback ridges, consequent, subsequent, obsequent, and resquent valleys of various orders, gullies, choes (seasonal streams), earth-pillars, rilled earth buttresses of conglomerate formations, semi-circular choe-divides, talus cones, colluvial cones, water-gaps, and choe terraces. Associated badlands features include the lack of vegetation, steep slopes, high drainage density, and rapid erosion rates.

To the South of the Siwaliks are the Indo-Gangetic plains and in the north, they are bordered by the Lesser Himalayas. Intermittently located between the Siwaliks and the Lesser Himalayas (exclusively in India and Nepal) are duns, flat-bottomed longitudinal structural valleys with their own drainage systems. These essentially comprise several large Himalayan piedmont alluvial fans and terraces, which formed as a result of tectonic episodes in the flanking Siwaliks. The duns also consist of lacustrine, fluvial, aeolian and swamp-environment deposits, and range from Middle Pleistocene to Holocene in age. During their formative stage, most of the duns were slightly narrower and have gradually expanded over time through the erosion of the adjacent Siwalik sediments (a continuing process). In Nepal, these duns were often naturally filled with alluvial sediments of lacustrine and fluvial deposits, thus burying palaeolithic sites that were later exposed through erosion. The monsoon rains temporarily supply seasonal streams (locally known as choes, khads, or nalas) located both within the Siwalik Hills and the adjacent duns. These stream banks and their terraces yield sizeable numbers of lithic artefacts, owing to the shared location for both water and raw material. The district is bounded by plains of Punjab in the West and Sola Singhi Dhar (Siwalik Range). The ranges trend in general NW-SE direction and between there is a longitudinal valley of the Soan River. The altitude varies from 300 metres to over 1200 metres above MSL on Sola Singhi Dhar. The width of the Jaswan Dun Valley ranges from 7 Kms to 14 Kms and the town of Una, which is nearly in the middle of the Dun valley (Jaswan Valley) is on the elevation of 427 Mts above MSL. In general most of the district lies between 600- 900 mts elevation and the slope is less than 10°.

The Una District can be divided into following three distinct zones as per elevation as:-

1. above 900 m.
2. 600-900 meters.
3. Less than 600meters.

The district can be divided into three distinct zones as per slope.

20m/Km

10-20m/Km

Less than 10m/Km

3.2 ALTITUDE, GENERAL TERRAIN DESCRIPTION, WITH MAP AND CONTOURS ENCOMPASSING THE MINE AREA: -

The applied lease area is situated in the form of Hill Slope. The map of the applied mining lease area on 1:2000 scale with two meters contour interval is Plate No III. The highest point of the applied lease area is 558 meters above MSL and lowest point is 508 meters above MSL. The applied Mining lease area is private land in the form of hill slope and is scarce of any kind of vegetations except small bushes and plants.

3.3 CLIMATE OF THE AREA

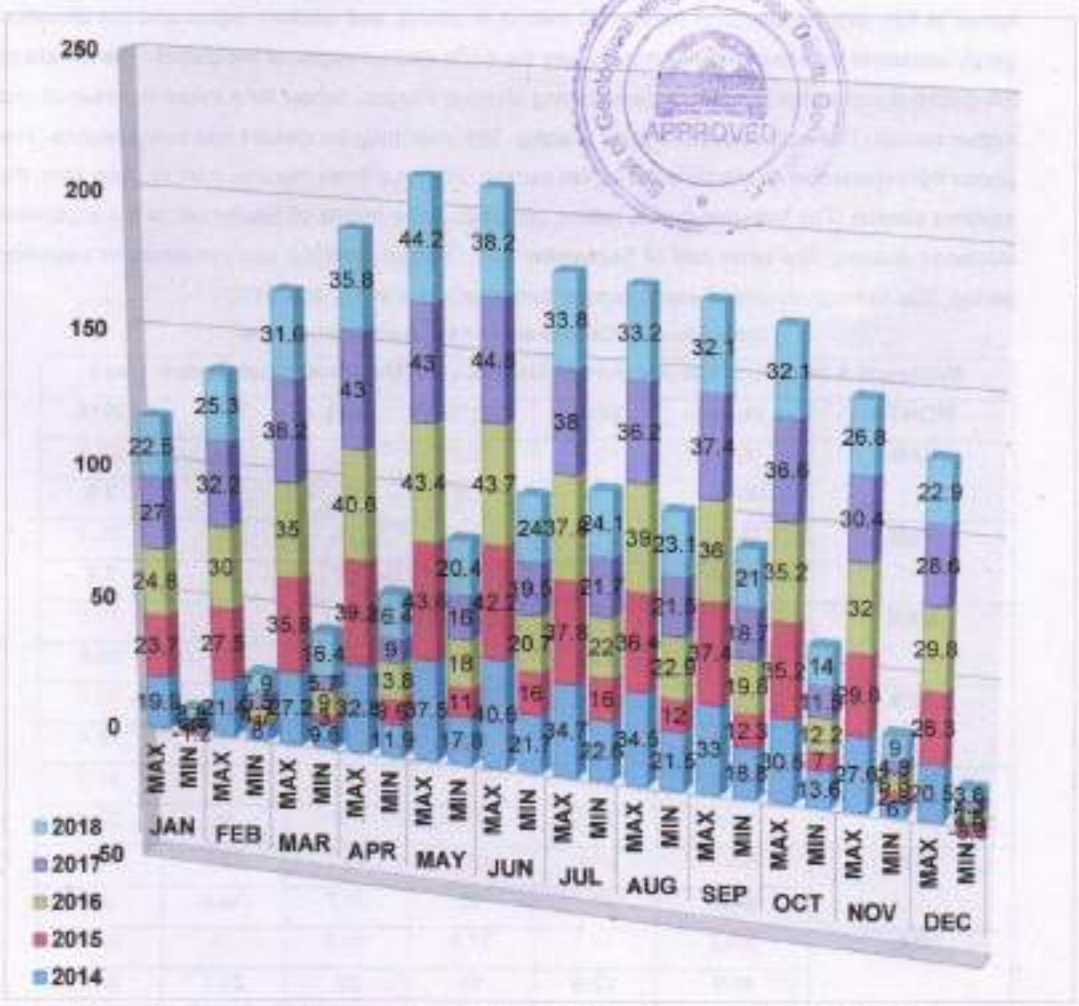
The climate of different parts of the district depends to some extent on the elevation. The terrain is hilly with an elevation below 300 metres in valleys and western region and the elevation gently increases by a few hundred metres over the north eastern region of the district. The climate of the district is somewhat like that of the adjoining plains of Punjab, except for a milder hot season and higher rainfall. The cold season is quite bracing. The year may be divided into four seasons. The period from November to March is the winter season. The next three months, April to June, form the summer season. The following period lasting up to about the middle of September is the southwest monsoon season. The latter half of September and October form the post-monsoon or transition period. The average minimum and maximum temperatures are 3°C and 45°C

Table Showing Climate around the applied lease area

Maximum & Minimum Temperature of District Una (Meteorological Centre- Una)						
MONTH	YEAR	2014	2015	2016	2017	2018
JAN	MAX	19.9	23.4	24.6	27	22.5
	MIN	4	1.2	0.2	0.6	3.8
FEB	MAX	21.4	27.5	30	32.2	25.3
	MIN	6	1	4.7	5.5	7.9
MAR	MAX	27.2	35.8	35	38.2	31.6
	MIN	9.6	3	9	5.7	16.4
APR	MAX	32.8	39.2	28.6	43	35.8
	MIN	11.9	9.6	13.8	9	16.4
MAY	MAX	37.5	43.6	43.4	43	44.2
	MIN	17.8	11	18	16	20.4
JUN	MAX	40.6	42.2	43.7	44.8	38.2
	MIN	21.7	16	20.7	19.5	24
JUL	MAX	34.7	37.8	37.8	38	33.8
	MIN	22.6	16	22	21.7	24.1
AUG	MAX	34.5	36.4	39	36.2	33.2
	MIN	21.5	12	22.9	21.5	23.1

SEP	MAX	33	37.4	36	37.4	32.1
	MIN	18.8	12.3	19.8	18.7	21
OCT	MAX	30.6	35.2	35.2	36.6	32.1
	MIN	13.6	7	12.2	11.5	14
NOV	MAX	27.6	29.8	32	30.4	26.8
	MIN	6	2.8	6.8	4.8	9
DEC	MAX	20.5	26.3	29.8	28.6	22.9
	MIN	1.6	-3.3	3.6	4.3	3.6

Source: Meteorological Department, Govt. of India



Average monthly temperature of the district Una from year 2014 to 2018

3.4 Rainfall of the Area

The Una district can be divided into three rainfall zones as

High	above 1400 mm
Medium	between 1400 and 1200 mm
Low	less than 1200 mm

The average annual rainfall in the district is 1209.0 mm. About 70 percent of the annual rainfall in the district is received during the short monsoon season July to September. July is the month with the heaviest rainfall. Rainfall amounting to about 14 percent of the normal is received during the cold season in association with passing western disturbances. The rainfall in the district generally increases from the southwest towards the northeast.

To have an idea about morphogenetic zone on the basis of rainfall it will not be ideal to classify it on the basis of the annual rainfall because most of the precipitation of the year is received in the rainy season hence the precipitation of the monsoon season is deciding precipitation for annual replenishment, bank erosion and other factors.

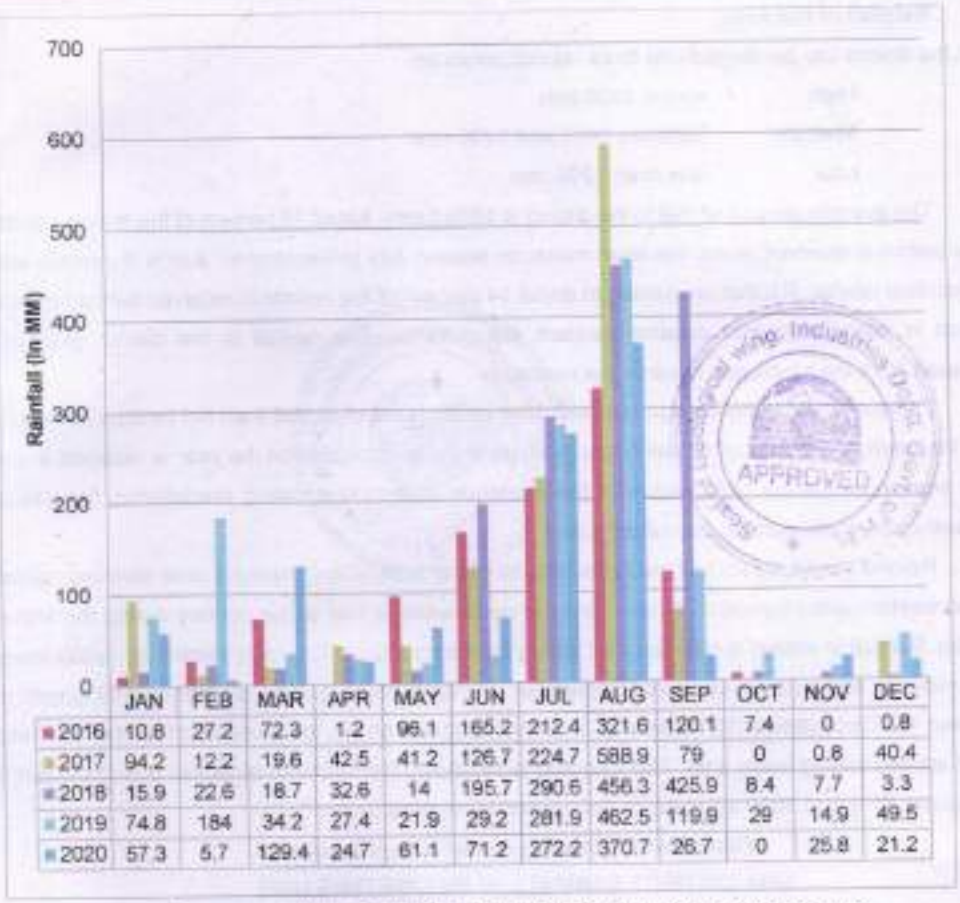
Rainfall varies significantly with the altitude of the area. The catchment area receives rainfall due to western disturbances that pass over the north-western part of the country during the winter months. Rainfall in valleys is also received during the winter month. The rainy season generally starts from mid-July and extends up to mid-September. During winter the rains are scarce and extend in between 15th December to 15th February. The following table shows the quantum of rainfall adjoining to the applied mining lease area. The following table shows the quantum of rainfall during the last 5 years from 2016 and 2020 adjoining to the applied lease area as per IMD.

Table Showing monthly rainfall data of the district

UNA DISTRICT RAINFALL IN MILLIMETERS (R/F)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	RAIN FALL (IN mm)											
2016	10.8	27.2	72.3	1.2	96.1	165.2	212.4	321.6	120.1	7.4	0	0.8
2017	94.2	12.2	19.6	42.5	41.2	126.7	224.7	588.9	79	0	0.8	40.4
2018	15.9	22.6	18.7	32.6	14	195.7	290.6	456.3	425.9	8.4	7.7	3.3
2019	74.8	184	34.2	27.4	21.9	29.2	281.9	462.5	119.9	29	14.9	49.5
2020	57.3	5.7	129.4	24.7	61.1	71.2	272.2	370.7	26.7	0	25.8	21.2

Source: Meteorological Department, Govt. of India



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2016	10.8	27.2	72.3	1.2	96.1	165.2	212.4	321.6	120.1	7.4	0	0.8
2017	94.2	12.2	19.6	42.5	41.2	126.7	224.7	588.9	79	0	0.8	40.4
2018	15.9	22.6	18.7	32.6	14	195.7	290.6	456.3	425.9	8.4	7.7	3.3
2019	74.8	184	34.2	27.4	21.9	29.2	281.9	462.5	119.9	29	14.9	49.5
2020	57.3	5.7	129.4	24.7	61.1	71.2	272.2	370.7	26.7	0	25.8	21.2

Average monthly rainfall data of the district Una from year 2016 to 2020

3.5 Any Other Important Features

Una district came into existence on 1 September 1972 and is situated in the south-western part of the State of Himachal Pradesh. The district, with its headquarter at Una town, has a geographical area of 1542 sq. km and covers 2.8 % area of the State. It lies between North latitude 31°18'00" & 31°55'00" and East longitude 75°55'00" & 76°28'00" and is covered in a survey of India degree sheet No.53A & 44M. Towards the north, it is bounded Kangra district, towards north- & east by Hamirpur & Bilaspur districts and towards south-west by the State of Punjab.

Agriculture is the major occupation of the people of the district with more than 70% population engaged in the agriculture and allied sector. Major crops like maize, wheat, rice, sugarcane and pulses are grown apart from the vegetables in the district. The total cultivable area is 443 sq. km and the net area sown is 388 sq. km. The net area irrigated in the district is about 85 sq. km. Groundwater is the major source of water in the district for irrigation and domestic use. There are large numbers of water supply wells & tube wells, springs, kulhs (water channels) and lift irrigation schemes

implemented exclusively for irrigation purposes. The irrigated command area under the Bhabaur Sahib Lift irrigation scheme, phase I and Phase II are 923 hectares and 2640 hectares respectively.

The proposed mining site is located in the form of Hill Slope near the village Kutharbeet. The site is approachable through Janani- Polian Road at a distance of approximately 4.50 Kms. from Polian. The site is at a distance of approximately 15.00 kilometres from the nearest major town Haroli.

3.6. DESCRIPTION OF THE AREA IN WHICH THE LEASE IS SITUATED: -

The applied mining lease area is situated in the form of hill slope located near village Kutharbeet. The Hill side is mainly comprised boulders, cobbles, pebbles, Bajri, Clay and Sand/Silt deposits of terrace alluvium. The study of the rocks in and around the applied mining lease area belongs to Siwalik Group comprising of Boulders, Pebbles, Cobbles, Clay, Sand and Silt (Conglomeratic deposits). The site is approachable through Janani- Polian Road at a distance of approximately 4.50 Kms. from Polian. The site is at a distance of approximately 15.00 kilometres from the nearest major town Haroli.

PART- I

DESCRIPTION OF GEOMORPHOLOGY AND MINE DEVELOPMENT

(1) DESCRIPTION OF THE AREA IN WHICH THE MINE IS SITUATED

1.1 GENERAL

The applied lease area is situated in the form of Hill Slope. The highest point of the applied lease area is 558 meters above MSL and lowest point is 508 meters above MSL. The applied Mining lease area is a private land and in the form of hill slope which contains small bushes and plants as vegetation.

1.2 SLOPE ANGLE

Uniform slope angles are observed in the area. The hill slope having a gentle slope with an angle of 25° to 35° in the applied for mining lease area. The conglomerate deposit, where the mining lease is applied is slightly undulating with 3-4 meters elevation difference from one end to other. Also, the adjoining lands are almost of the same nature as the area under consideration is adjoining to the Punjab State.

Image showing gentle Slope angle

1.3 TYPE OF DRAINAGE IN THE AREA

The adjoining area shows dendritic type of drainage with formulation of gullies. Only small gullies pass besides the applied mining lease area. These small gullies drain into local nalla and further drain into Swan River which is perennial stream of the area.

1.4 SUSCEPTIBILITY OF AREA TO LAND SLIDE

As the applied mining lease areas is hill with gentle slope and as the adjoining lands are almost flat with very less gradient, there is no scope of landslide in the vicinity of the applied mining lease area. The hill slope is mostly comprised of conglomerate beds with thin soil cover in the applied mining lease area. The slope at places is uniform and if the mining operations would be carried out in a systematic and scientific way, there are negligible chances of any landslide. Moreover, no adverse joint pattern is observed in the applied mining lease area which can lead to any further rock/slope failure.

1.5 SPRINGS IN THE AREA

No spring is noticed within the applied mining lease area.

1.6 ANY OTHER DETAILS

Surface map of the applied mining lease area as well as the adjoining area of the mining lease showing all the surface features are attached as Plate-I.

(2). GEOLOGY

2.1 GEOLOGY OF THE APPLIED LEASE AREA

Siwalik Group

The Siwalik Group mainly represents the rocks of the district. In addition to this at few places the newer alluvium of Quaternary age is also present.

The Siwalik deposits are one of the most comprehensively studied fluvial sequences in the world. They comprise mudstones, Claystone, and coarsely bedded conglomerates laid down when the region was a vast basin during Middle Miocene, to Upper Pleistocene times. The sediments were deposited by rivers flowing southwards from the Greater Himalayas, resulting in extensive multi-ordered drainage systems. Following this deposition, the sediments were uplifted through intense tectonic regimes (commencing in Upper Miocene times), subsequently resulting in a unique topographical entity - the Siwalik Hills. The Siwaliks are divided stratigraphically into three major Subgroups - Lower, Middle, and Upper. These Subgroups are further divided into individual Formations that are all laterally and vertically exposed today in varying linear and random patterns.

Ongoing erosion and tectonic activity has greatly affected the topography of the Siwaliks. Their present-day morphology is comprised of hogback ridges, consequent, subsequent, obsequent, and

resquent valleys of various orders, gullies, choes (seasonal streams), earth-pillars, rilled earth buttresses of conglomerate formations, semi-circular choe-divides, talus cones, colluvial cones, water-gaps, and choe terraces. Associated badlands features include the lack of vegetation, steep slopes, high drainage
density, and rapid erosion rates.

In the advent of Neogene a depression was formed in front of the rising mountains (Proto-Himalaya). This depression becomes a repository of a thick sequence of molassic sediments of the Siwaliks. The Siwalik Group comprising conglomerates friable micaceous Claystone, siltstone and clay stone.

The conglomerates in general are poorly cemented but at places they are very hard. These consist mainly of pebbles and cobbles of quartzite. The stray pebbles of granite, limestone, Claystone, braccia and lumps of clay stone are also observed at places. Often the size of pebbles is large enough to be called as Boulders. The conglomerates not only occur as regular band but also as lenticular bands alternative with micaceous Claystone and clay beds. The sediments were bought down 2 to 25 million years ago by the numerous fast flowing rivers issuing forth from rapidly Rising Mountain mass of the Himalaya, in the north.

The Siwalik Group is divisible into three sub-groups respectively the Lower, Middle and Upper on the basis of the lithostratigraphy

Lower Siwaliks: - The lower Siwalik consists essentially of a Claystone-clay alternation. In district Una, the lower sequence of the lower Siwalik consists of medium grained sub graywacke inter bedded with thick red clay, but higher up in sequence, Claystones are coarser and clasts become more frequent while the clays are less developed. The uppermost horizon consists of conglomerate with well-rounded clasts of grey quartzite possible derived from the Shali. The total thickness is 1600 meters.

Middle Siwaliks: - The Middle Siwalik Sub group comprises of large thickness of coarse micaceous Claystone along with some inter beds of earthy clay and conglomerate. It normally succeeds the Lower Siwalik along a gradational contact. The Claystone is less sorted than those in Lower Siwaliks. Clay bends are dull coloured and silty. The general thickness is 1400 to 2000 meters

Upper Siwaliks:-The Upper Siwalik is mainly represented by Claystone inter bedded with silt and conglomerate. The lower portion of the Upper Siwalik mainly consists of soft, massive, pebbly Claystone with intercalations of conglomerates. In the upper portion the conglomerate intercalation is replaced by the clays intercalations. The general thickness in the district is 2300 meters.

River terraces are seen flanking the present day streams but some terraces occupy the ridges. Perhaps they are the vestiges of the original regime of the Swan River. The gravel beds are the result of action of the present day stream. Gravel beds constitute an important source of quartzite fragments.

GEOLOGICAL MAP OF UNA DISTRICT

Older Alluvium:

The Older Alluvium in Dun valley is designated as Dun Gravels while in the plains as Varanasi (Ambala). It is a multicyclic sequence of brown to grey silt, clay with Kankar and reddish brown to grey micaceous Clay with pebbles.

Newer Alluvium:

Newer Alluvium has been subdivided into Fan Alluvium encompassing of brownish grey clay, Clay and gravel sequence, lies dis-conformably over Older Alluvium within a narrow zone immediately to the south of Siwalik hill and terrace alluvium exposed as depositional terraces of Beas and Swan

River and comprising of cyclic sequence of grey, micaceous, fine to coarse grained Clay, silt and clays.

Lithostratigraphy of Dumri Una

Group			Lithology	Age	Approx Thickness
Newer Alluvium			Sand, silt, gravel and Pebbles	Quaternary	Variable
Siwalik Group	Upper Siwalik	B	Predominantly massive conglomerate with red and orange clay as matrix and minor sandstone and earthy buff and brown calystone		2300 meter
		A	Sandstone, clay and conglomerate alternation		
	Middle Siwalik	B	Massive Sandstone with minor conglomerate and local variegated claystone		1400 to 2000 meter
		A	Predominantly medium to coarse- grained sandstone and red clay alternation, soft pebbly with subordinate claystone, locally thick prism of conglomerate		
	Lower Siwalik	B	Alternation of fine to medium-grained sporadically pebbly sandstone, calcareous cement and prominent chocolate and medium maroon claystone in the middle part		1600 meter
		A	Red and mauve claystone with thin intercalations of medium to fine grained sandstone		

Lithostratigraphy of Una District

Alluvial fans, river terraces and gravels beds of recent age and the Claystone, clay stone and conglomerate belonging to Siwalik Group are the main Formations in this District. The Siwalik comprises conglomerates, friable Claystone, siltstone, and clay stone. The conglomerate are loose consisting mainly of cobbles and pebbles of quartzite and stray pebbles of granite, limestone, Claystone and lumps of clay stone are also present. The matrix when present consists of medium to coarse grained Clay and places of calcareous cement which imparts certain degree of hardness to the otherwise loose conglomerate beds. They vary in thickness from 15 cms. to 2.5 meters. They do not show clear stratification and occurs as a thin bed. The Claystones are poorly stratified and consequently are soft and friable. They are pale grey to brownish in colour, moderately to well sorted and medium to coarse grained in texture. Clay lumps and pellets are not within the Claystones.

Recent deposits constitute gravel beds, alluvial fans and river terraces. Alluvium occupies the vast stretch of the plain. They contain Clay, silt, and clay in varying proportion.

2. 2 THE LOCAL GEOLOGY OF THE AREA:

The applied lease area forms a part of hill slope and is covered with B Members of the Upper Siwalik Formation. The Hill side is mainly comprised of thick boulder bed of the B Member of the Upper Siwalik Formation comprising of boulders, cobbles, pebbles, river borne Bajri, Clay and Sand/Silt deposits of terrace alluvium. The study of the rocks in and around the applied mining lease area belongs to Siwalik Group comprising of Boulders, Pebbles, Cobbles, Clay, Sand and Silt (Conglomeratic deposits).

2.3 DETAILS OF PROSPECTING WORK UNDERTAKEN IN THE MINING AREA

The similar kind of conglomeratic deposits are clearly visible along the road section as well as in the adjoining area of applied mining lease to the applicant hence, there is no need to carry out the prospecting operations. In addition to this, availability of the minor minerals in the Hill are quite evident on the exposures formed due to erosive action.

2.4 THE NATURE OF ROCKS AND THEIR ATTITUDE.

The applied mining lease area comprises predominantly the boulders, cobbles, pebbles, bajri, Sand, Clay and silt deposit. The boulders are white, spotted white, greenish white pink, purple and dark green in colour. Quartzite fragments are rounded, sub-rounded and discoidal in shape having smooth surface. The size of minor mineral varies from silt to boulder.

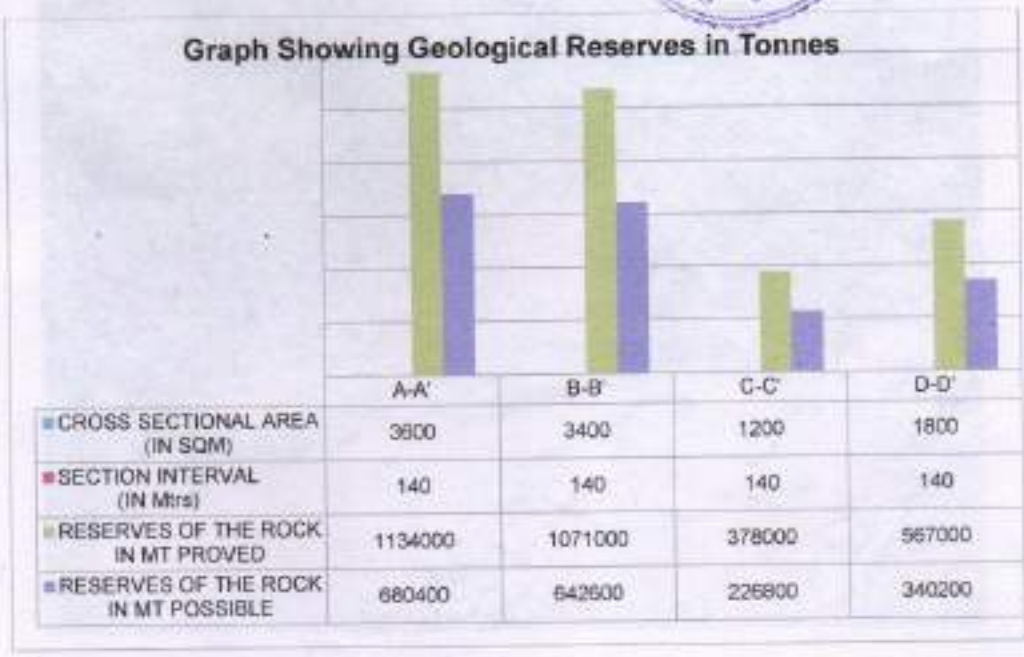
(3) RESERVES ESTIMATE

3.1 ESTIMATES OF GEOLOGICAL RESERVE OF EACH MINERAL

The Geological reserves have been estimated by the cross-sectional area method and 04 nos. of cross sections A-A', B-B', C-C' & D-D' were plotted at 140 meters interval (Plate no. IV). The cross-sectional area of rock was measured separately to obtain the volume and it was multiplied by strike influence of each section. The volume thus obtained was multiplied by the specific gravity to obtain the reserves in metric tonnes. The average specific gravity of rock has been considered as 2.25. As no exploration works by way of drilling have been carried out but, it is implied from the field observations made above and below the road section that similar kind of rock is available along the hill and is easily visible all along the surface as well. In view of the above, the 100% reserves are kept in the proved category. The details of geological reserves of the rock are as mentioned in the table below:

Table showing Geological reserves in metric tonnes

TABLE SHOWING GEOLOGICAL RESERVES						
SECTION LINE	CROSS SECTIONAL AREA (IN SQM)	SECTION INTERVAL (IN Mtrs)	RESERVES OF THE ROCK IN CUM		RESERVES OF THE ROCK IN MT	
			PROVED	POSSIBLE	PROVED	POSSIBLE
A-A'	3600	140	504000	302400	1134000	680400
B-B'	3400	140	476000	285600	1071000	642600
C-C'	1200	140	168000	100800	378000	226800
D-D'	1800	140	252000	151200	567000	340200
				TOTAL	3150000	1890000



3.2 CONSTRAINING CONSIDERATIONS FOR MINING

Although no point of public utility exists near the applied Mining Lease area and only a kacha village road is passing above the applied mining lease area. In order to avoid any apprehension of damage to this road, a safety/buffer zone of 05 meters from the periphery of the applied mining lease boundary is kept as safety zone for the adjoining land as well as village road. Also, to avoid the rolling down of the excavated material towards the road, check dams/retaining structures/crate walls all along the applied mining lease boundary facing the road are proposed and will be constructed during the course of excavation so as to avoid any rolling down of debris on the road.

4.3 ESTIMATED MINEABLE DEPOSITS OF THE MINE AREA:

All the geological reserves are not mineable. The mineable reserves have been estimated by the cross-sectional area method and 04 numbers of cross sections A-A', B-B', C-C' & D-D' were plotted at 140.00 meters interval. To calculate mineable reserves, the volume of each bench was calculated and the volume so arrived was multiplied by the specific gravity. The specific gravity of conglomerate has been taken as 2.25 for calculating the mineable reserves.

The details of geological reserves of the rock are as mentioned in the table below

Table Showing Estimated Mineable Reserves in Tonnes	
Reserves	**Quantity (In MT)**
Total Reserves	1966945
Useable Reserves	1671905
Wastage	295040

Graph showing mineable reserves

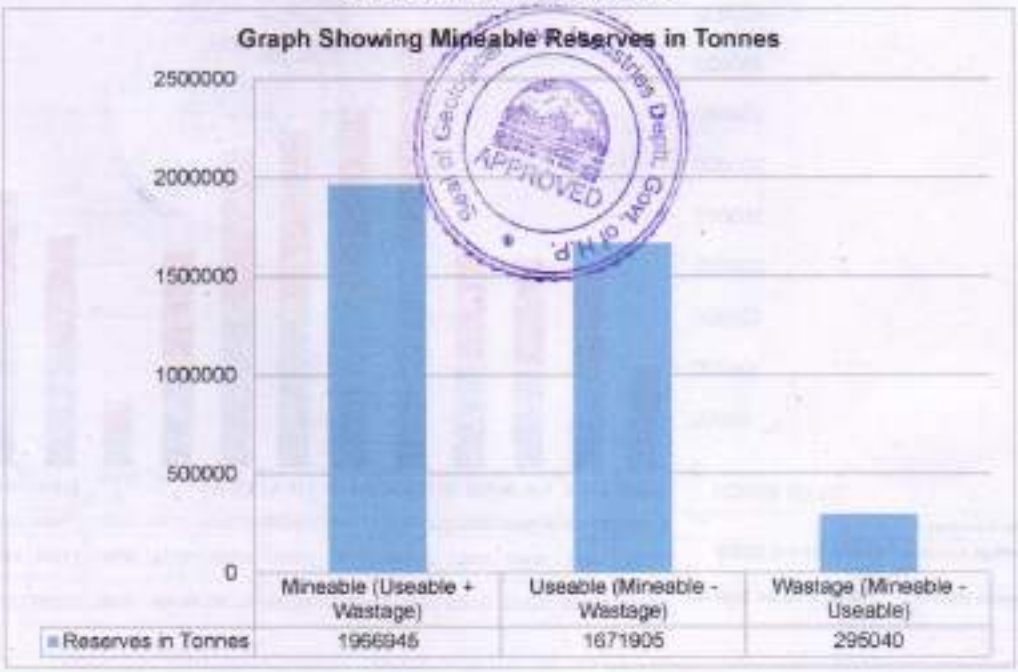


Table showing quantity of mineable reserves in MT

Bench No.	Rl of Bench In meters	Area In Sq.m	Specific Gravity	Average Height In meters	Total Reserves In MT	Wastage including Top Soil, Silt and Mining Wastage In MT	Useable Material (Stone, Boulder, Bajri and Sand) In MT	Cumulative reserves In MT
BLOCK A								
1	554 A	6400	2.25	3.60	51840	5184	46656	46656
2	550 A	12200	2.25	3.60	98820	9882	88938	135594
3	546 A	12500	2.25	3.70	104063	10406	93656	229250
4	542 A	13000	2.25	3.70	108225	10823	97403	326653
5	538 A	28300	2.25	3.40	216495	21650	194846	521498
6	534 A	22600	2.25	3.50	177975	17798	160178	681676
7	530 A	21200	2.25	3.50	166950	16695	150255	831931
8	526 A	20000	2.25	3.50	157500	15750	141750	973681
9	522-I A	13600	2.25	3.50	107100	10710	96390	1070071
10	522-II A	3600	2.25	4.00	32400	3240	29160	1099231
11	518 A	14400	2.25	3.50	113400	11340	102060	1201291
12	514 A	16200	2.25	3.70	134865	13487	121379	1322669
13	510 A	14000	2.25	4.00	126000	12600	113400	1436069
	TOTAL				**1595632**	**159565**	**1436069**	

Graph Showing Quantity of Mineable & Useable Reserves in MT (Block-A)

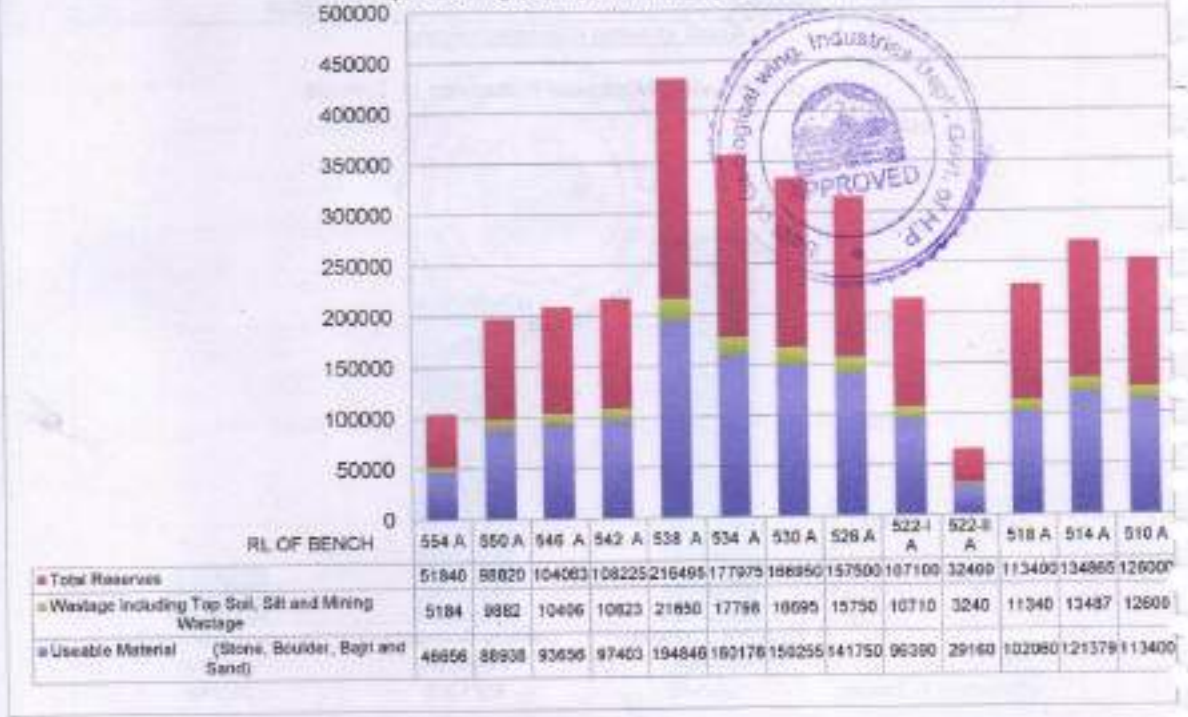
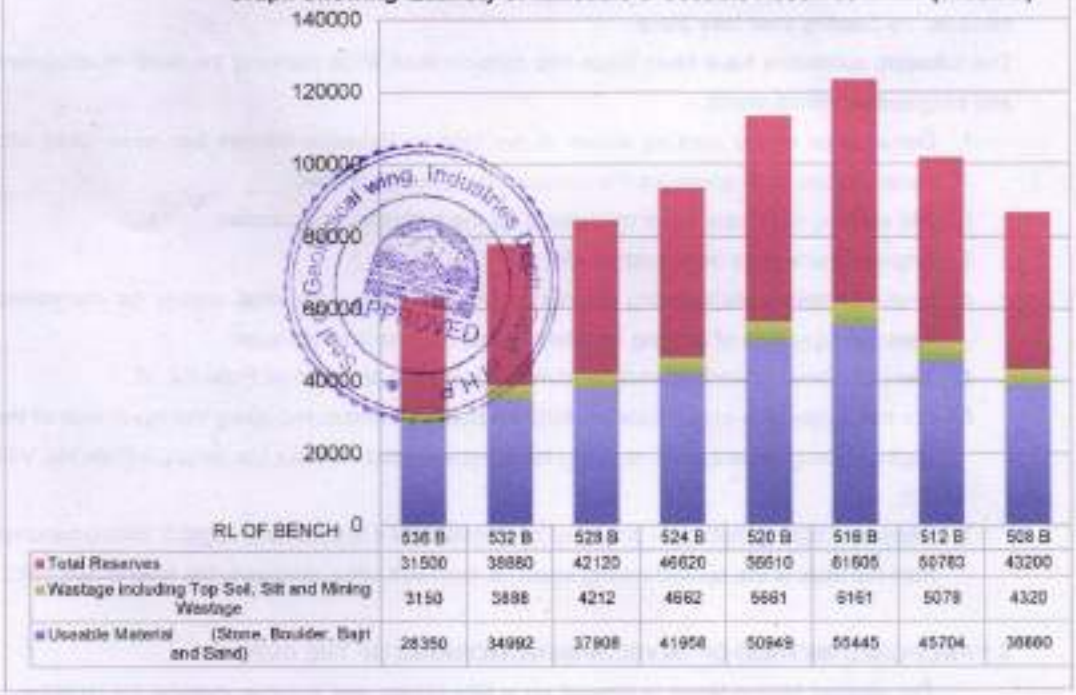


Table showing quantity of mineable reserves in MT

Bench No.	Rl of Bench In meters	Area In Sq.m	Specific Gravity	Average Height In meters	Total Reserves In MT	Wastage including Top Soil, Silt and Mining Wastage In MT	Useable Material (Stone, Boulder, Bajri and Sand) In MT	Cumulative reserves In MT
BLOCK B								
14	536 B	4000	2.25	3.50	31500	3150	28350	28350
15	532 B	4800	2.25	3.60	38880	3888	34992	63342
16	528 B	5200	2.25	3.60	42120	4212	37908	101250
17	524 B	5600	2.25	3.70	46620	4662	41958	143208
18	520 B	6800	2.25	3.70	56610	5661	50949	194157
19	516 B	7400	2.25	3.70	61605	6161	55445	249602
20	512 B	6100	2.25	3.70	50783	5078	45704	295306
21	508 B	4800	2.25	4.00	43200	4320	38880	334186
	TOTAL				**371318**	**37132**	**334186**	

Graph Showing Quantity of Mineable & Useable Reserves In MT (Block-B)



As per the dimension and shape of the applied mining lease area and also keeping in view the mineral conservation and potential, the applied mining lease area has been divided into two blocks namely "Block-A" and "Block-B". Accordingly, the open cast mining operations by formation of benches in these blocks has been proposed. The plan showing ultimate pit position by the end of 05 years is attached as Plate – V.

3.4 CONCEPTUAL SCHEME OF MINING AND LIFE OF MINE

The mining operations shall be carried out from the top of the applied mining lease area after leaving 05 meters buffer/safety zone. The mineral excavation starts from RL 554 onwards by preparing 4X4 meters (Height X Width) benches during the five years of mining. Twenty-one numbers of benches are proposed to be developed while excavating the mineral from the applied mining lease area. As per the reserves calculated, the mine has only 05 years reserves available under proved category at the proposed scale of production which can easily cater the need of the required mineral in the stone crusher unit. These may vary as the reserves under probable category have not been taken into account as of now. Based on the present mineable reserves with the proposed scale of production, the mine has 5 years of life.

(4) MINE DEVELOPMENT AND PLAN OF PROGRESSIVE MINING: -

The mining operations would be carried out mechanically with the help of poclain/excavator and breakers. Also, manual help would be required to carry out the mining operations. The mining operations would be mechanical as well as semi – mechanical and manual as per the requirement however; no blasting shall take place.

The following conditions have been taken into consideration while planning the mine development and progressive mining works: -

1. Demarcation of the area as shown in the field by Revenue officials has been taken into consideration while preparing the contour cum Geological Plan.
2. 280 working days have been considered for the purpose of calculation.
3. Angle of repose has been kept as 45°.
4. In-situ parapet walls/retaining structures/gabions/ crate walls shall always be maintained towards valley side of working benches so that no material rolls down.
5. The plan showing working sections during 05 years is attached as Plate No. VI.
6. For the safety wire crate/ Gabion structure shall be constructed along the lower side of the applied mining lease area to stop any rolling down of debris/rocks (as shown in Plate No. VIII-XII).
7. Open cast mining method is proposed by formation of 4 X 4 meters(Height X Width) benches from top level of the applied mining lease i.e. from 558 mR.L. and up to the level of 508 mR.L.

4.1 PROPOSED METHOD OF DEVELOPMENT/WORKING OF THE DEPOSIT

The applied Mining lease is located on a hilly terrain and suitable material for crushing is available in whole of the applied mining lease area. Keeping in view the suitability of the mineral, open cast mining method is proposed by formation of 4 X 4 meters(Height X Width) benches from top level of the applied mining lease area.

This method of mining is adopted on the basis of concept of changing hill slope within the proposed limits of mining that the ultimate pit limit and restoring the area by making benches and

Table showing quantity of mineable reserves in MT								
Bench	Rl of Bench	Area	Specific Gravity	Average Height	Total Reserves	Wastage including Top Soil, Silt and Mining Wastage	Useable Material (Stone, Boulder, Bajri and Sand)	Cumulative reserves
No.	In meters	In Sq.m		In meters	In MT	In MT	In MT	In MT
BLOCK B								
14	536 B	4000	2.25	3.50	31500	3150	28350	28350
15	532 B	4800	2.25	3.60	38880	3888	34992	63342
16	528 B	5200	2.25	3.60	42120	4212	37908	101250
17	524 B	5600	2.25	3.70	46620	4662	41958	143208
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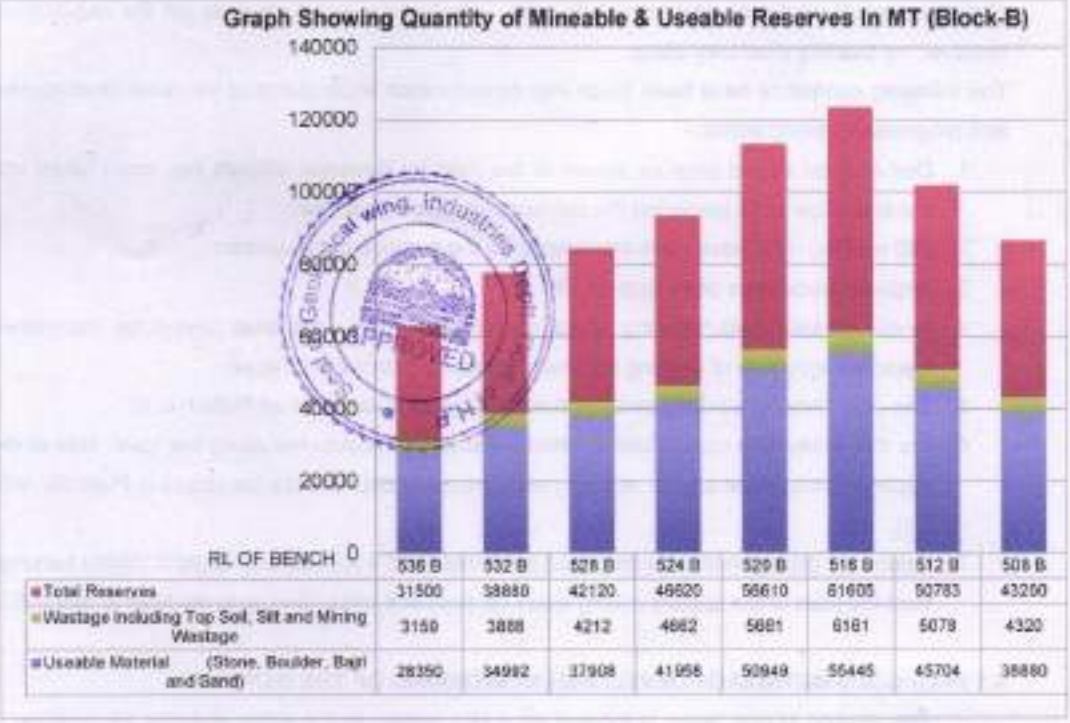
21	508 B	4800	2.25	4.00	43200	4320	38880	334186
	TOTAL				371318	37132	334186	



As per the dimension and shape of the applied mining lease area and also keeping in view the mineral conservation and potential, the applied mining lease area has been divided into two blocks namely "Block-A" and "Block-B". Accordingly, the open cast mining operations by formation of benches in these blocks has been proposed. The plan showing ultimate pit position by the end of 05 years is attached as Plate – V.

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The applied Mining lease is located on a hilly terrain and suitable material for crushing is available in whole of the applied mining lease area. Keeping in view the suitability of the mineral, open cast mining method is proposed by formation of 4 X 4 meters(Height X Width) benches from top level of the applied mining lease area.

This method of mining is adopted on the basis of concept of changing hill slope within the proposed limits of mining that the ultimate pit limit and restoring the area by making benches and

pitting in the hill slopes thereby least disturbance of the area due to mining. Working in the applied mining lease area shall mostly be done by way of mechanical and semi-mechanical and wherever required, by manual operations however; no drilling blasting operations shall take place.

The slice plan of the applied mining lease area for the 05 years working is attached as Plate No. VII.

4.2 DEVELOPMENT AND PRODUCTION PROGRAMME FOR THE FIRST FIVE YEARS

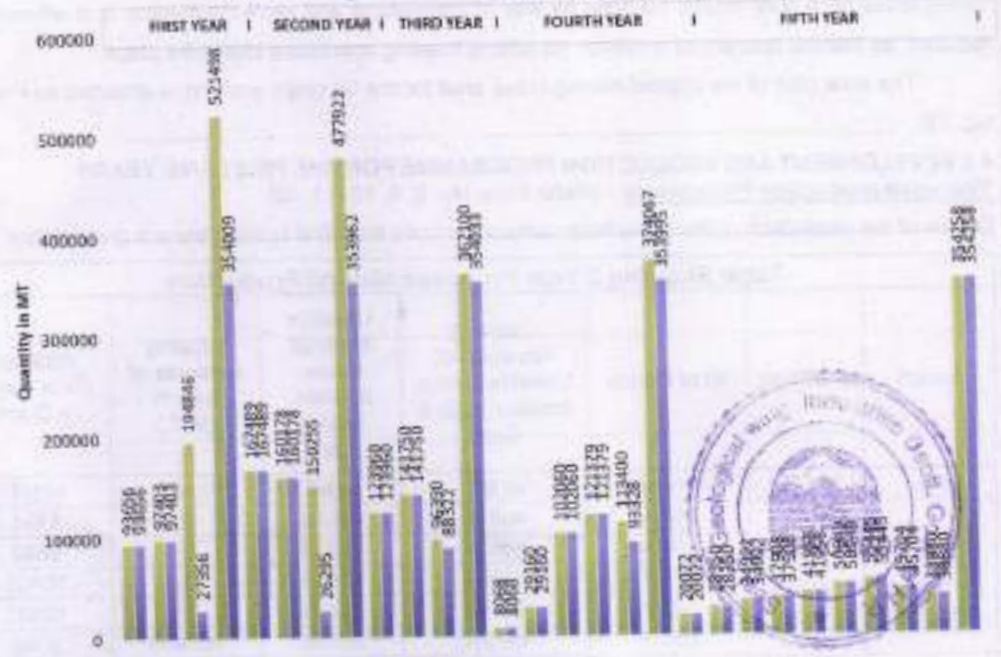
Year wise production Programme: - (Refer Plate No. 8, 9, 10, 11, 12)

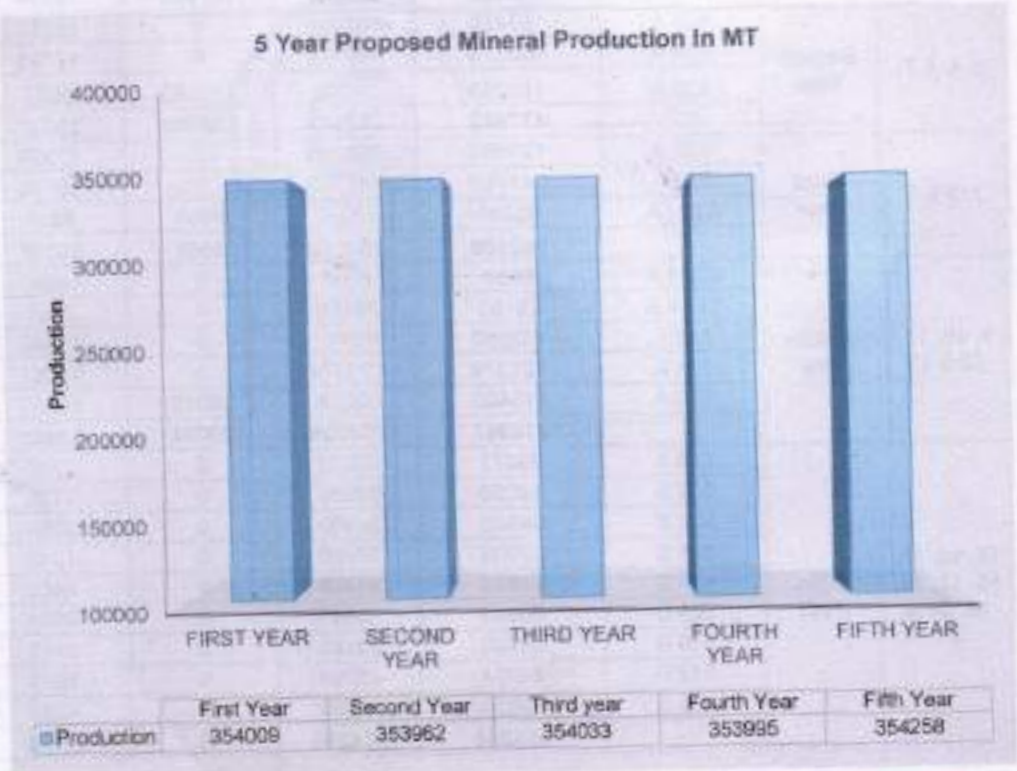
Details of the production of the stone from various benches from first to fifth year are given below:

Table Showing 5 Year Proposed Mineral Production

Bench	Duration	RI of Bench	Opening reserves of Useable Stone, boulder, bajri & Sand	Useable Material Stone, boulder, bajri & Sand	Closing reserves of bench (M.T.)	Wastage (Silty Sand + Clay)
No.	In Year	In meters	In MT	In MT	In MT	In MT
1, 2, 3, 4 & 5	First Year	554 A	46656	46656	0	5184
		550 A	88938	88938	0	9882
		546 A	93656	93656	0	10406
		542 A	97403	97403	0	10823
		538 A	194846	27356	167489	3040
			521498	**354009**	**167489**	**39335**
5, 6 & 7	Second Year	538 A	167489	167489	0	18610
		534 A	160178	160178	0	17798
		530 A	150255	26295	123960	2922
			477922	**353962**	**123960**	**39330**
7, 8 & 9	Third Year	530 A	123960	123960	0	13773
		526 A	141750	141750	0	15750
		522 I A	96390	88322	8068	9814
			362100	**354033**	**8068**	**39337**
9, 10, 11, 12 & 13	Fourth Year	522 I A	8068	8068	0	896
		522 II A	29160	29160	0	3240
		518 A	102060	102060	0	11340
		514 A	121379	121379	0	13487
		510 A	113400	93328	20072	10370
			374067	**353995**	**20072**	**39333**
13, 14, 15, 16, 17, 18, 19, 20 & 21	Fifth Year	510 A	20072	20072	0	2230
		536 B	28350	28350	0	3150
		532 B	34992	34992	0	3888
		528 B	37908	37908	0	4212
		524 B	41958	41958	0	4662
		520 B	50949	50949	0	5661
		516 B	55445	55445	0	6161
		512 B	45704	45704	0	5078
		508 B	38880	38880	0	4320
			354258	**354258**	**0**	**39362**

5 Year Proposed Mineral Production In MT





4.3 YEAR-WISE PRODUCTION, OVERBURDEN, RUN OF MINE, SALEABLE MINERAL, MINERAL REJECTS/ MINE WASTE

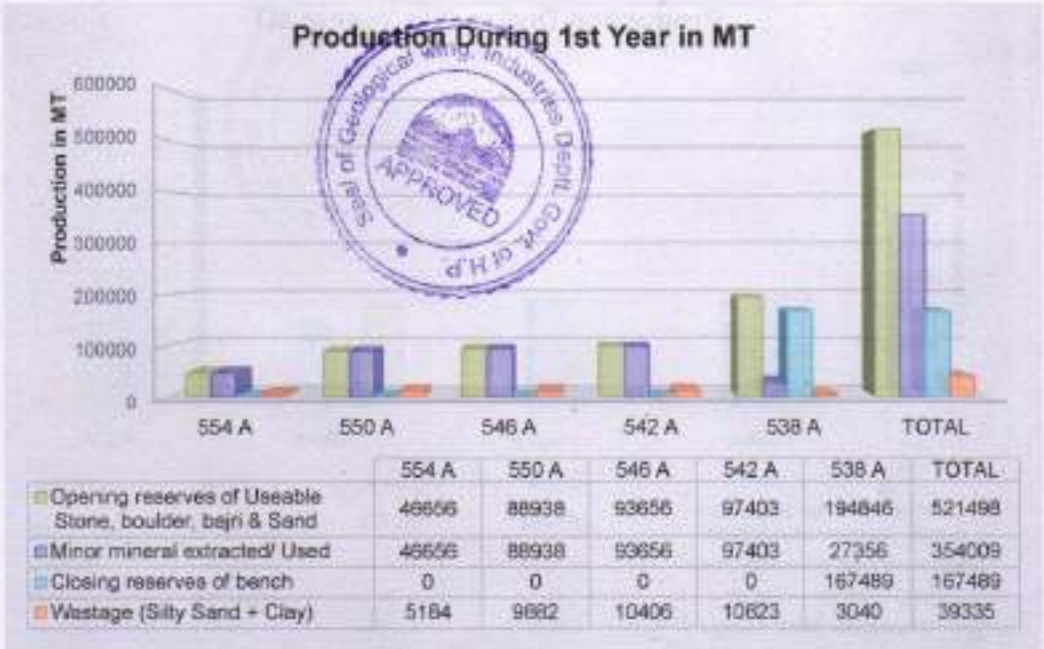
4.3 (A) DEVELOPMENTS AND PRODUCTION AT THE END OF THE IST YEAR (PLATE NO.-8)

Annual production proposed to meet the requirement of the stone crusher unit would be around 354009 metric tonnes of Stone, Boulder, Bajri & Sand for the 1st year. For this, benches in Block A at 554A, 550A, 546A, 542A & 538A m.R.L. shall be opened with total useable reserves of 521498 metric tonnes. The benches at 554A, 550A, 546A, 542A m.R.L. shall be fully exhausted and the bench at 538A m.R.L. shall be worked in part. Re-grassing and Plantation of bushes and local trees shall be done at the location marked as 'P-1" after spreading the soil cover. One number of check dams of 8 meters length with 1.5 meter height will be constructed at C-1 locations shown in Plate-8. The top soil available on the surface shall be collected and stacked at soil dump S-1 location and the waste material shall be dumped at D.Y. location marked on Plate No. - 8.

Table showing activity during the 1st year

Production Of Each Mineral in First Year (In MT)						
Bench	Duration	Rl of Bench	Opening reserves of Useable Stone, boulder, bajri & Sand	Minor mineral extracted/ Used	Closing reserves of bench	Wastage (Silty Sand + Clay)
No.	In Year	In meters	In MT	In MT	In MT	In MT
1, 2, 3, 4 & 5	First Year	554 A	46656	46656	0	5184
		550 A	88938	88938	0	9882
		546 A	93656	93656	0	10406
		542 A	97403	97403	0	10823
		538 A	194846	27356	167489	3040
		TOTAL	**521498**	**354009**	**167489**	**39335**

Graph Showing Reserves during 1st Year



	554 A	550 A	546 A	542 A	538 A	TOTAL
Opening reserves of Useable Stone, boulder, bajri & Sand	46656	88938	93656	97403	194846	521498
Minor mineral extracted/ Used	46656	88938	93656	97403	27356	354009
Closing reserves of bench	0	0	0	0	167489	167489
Wastage (Silty Sand + Clay)	5184	9882	10406	10823	3040	39335

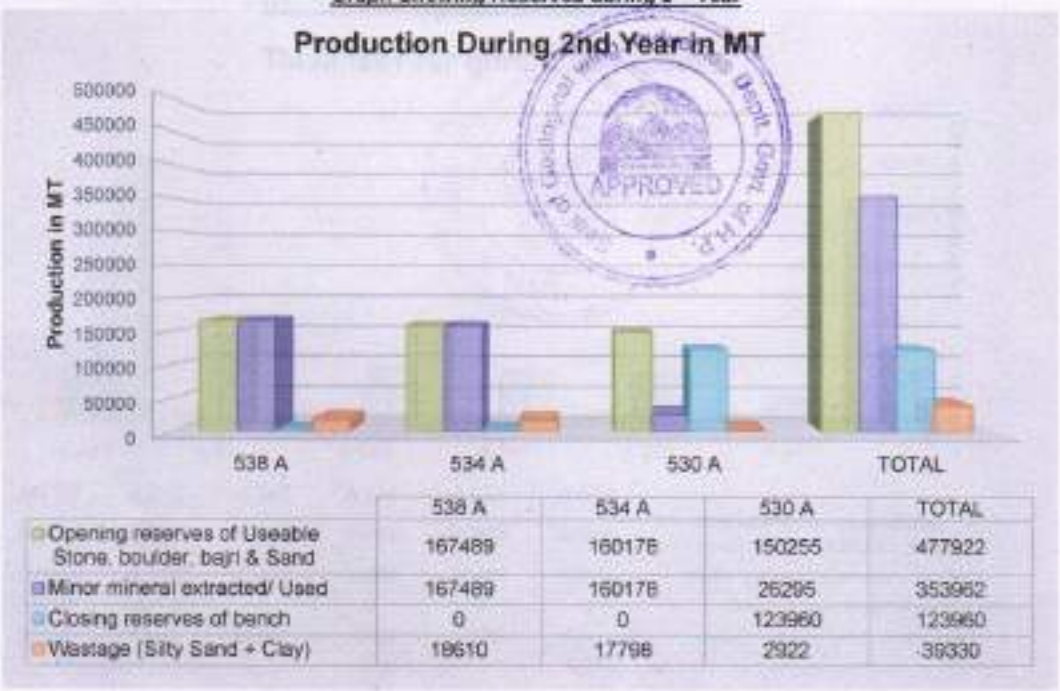
4.3 (B) DEVELOPMENTS AND PRODUCTION AT THE END OF IIND YEAR (PLATE NO-9)

During this year 353962 metric tonnes of Stone, Boulder, Bajri & Sand production is proposed to meet the requirement of the stone crusher unit. To fulfil this requirement, remaining material from the bench at 538A m.R.L. shall be used and new benches in Block A at 534A mR.L. and 530A mR.L. shall be opened with total useable reserves of 477922 M.T. The benches at 538A mR.L. & 534A mR.L. shall be fully exhausted and the bench at 530A m.R.L. with total reserves of 50255 metric tonnes of material shall be partly worked and only 26295 M.T. shall be extracted. The remaining material of this bench shall be used in the next working year. The top soil generated shall be dumped at location marked on Plate No- 9 at soil dump S-2. Re-grassing and plantation of bushes and local trees will be done at location P-2 as show on the Plate No- 9. One check dam of 8.00 meters length and 1.50 meter height shall be raised at C-2 location as marked on Plate No.- 9.

Table showing activity during the 2nd year

Production Of Each Mineral in Second Year (In MT)						
Bench	Duration	Rl of Bench	Opening reserves of Useable Stone, boulder, bajri & Sand	Minor mineral extracted/ Used	Closing reserves of bench	Wastage (Silty Sand + Clay)
No.	In Year	In meters	In MT	In MT	In MT	In MT
5, 6 & 7	Second Year	538 A	167489	167489	0	19610
		534 A	160178	160178	0	17798
		530 A	150255	26295	123960	2922
		TOTAL	**477922**	**353962**	**123960**	**39330**

Graph Showing Reserves during 2nd Year



	538 A	534 A	530 A	TOTAL
Opening reserves of Useable Stone, boulder, bajri & Sand	167489	160178	150255	477922
Minor mineral extracted/ Used	167489	160178	26295	353962
Closing reserves of bench	0	0	123960	123960
Wastage (Silty Sand + Clay)	19610	17798	2922	39330

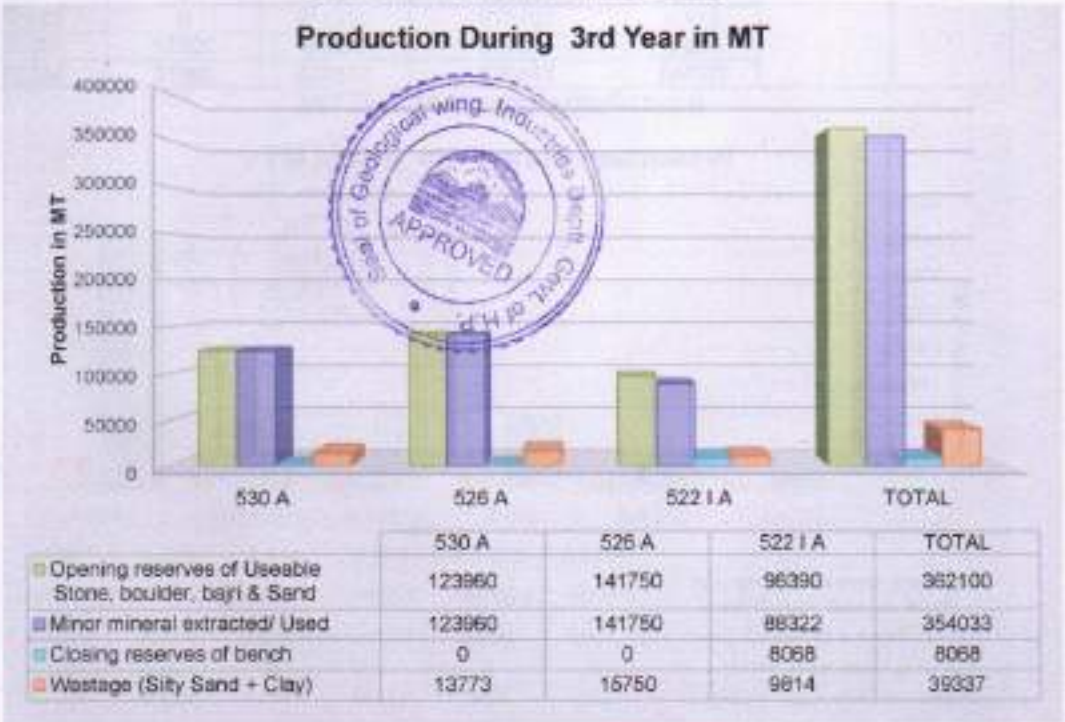
4.3 (C) DEVELOPMENT AND PRODUCTION AT THE END OF THE 3RD YEAR (PLATE NO.-10)

During this year, the remaining material from 530 meters R.L. bench shall be extracted and new benches in Block A at at 526A mR.L. and 522 I A mR.L. (522 I A) shall be opened to meet out the requirement of 354033 metric tonnes of Stone, Boulder, Bajri & Sand. The benches at 530 mR.L. & 526A mR.L. shall be fully exhausted and the bench at 522 I A m.R.L. (522 I A) with total reserves of 96390 metric tonnes of material shall be partly worked and only 88322 M.T. of material shall be extracted. The remaining material of this bench shall be used in the next working year. The top soil generated shall be dumped at location marked on Plate No.-10 at soil dump S-3. The previously dumped top soil shall be lifted and spread over the exhausted benches. Re-grassing and Plantation shall be raised on this bench at P-3 location. A check dam will be constructed with a length of 8.00 meters and 1.5 meters height at C-3 location.

Table showing activity during the 3rd year

Production Of Each Mineral in Third Year (In MT)						
Bench	Duration	Rl of Bench	Opening reserves of Useable Stone, boulder, bajri & Sand	Minor mineral extracted/ Used	Closing reserves of bench	Wastage (Silty Sand + Clay)
No.	In Year	In meters	In MT	In MT	In MT	In MT
7, 8 & 9	Third year	530 A	123960	123960	0	13773
		526 A	141750	141750	0	15750
		522 I A	96390	88322	8068	9814
		TOTAL	**362100**	**354033**	**8068**	**39337**

Graph Showing Reserves during 3rd Year



	530 A	526 A	522 I A	TOTAL
Opening reserves of Useable Stone, boulder, bajri & Sand	123960	141750	96390	362100
Minor mineral extracted/ Used	123960	141750	88322	354033
Closing reserves of bench	0	0	8068	8068
Wastage (Silty Sand + Clay)	13773	15750	9814	39337

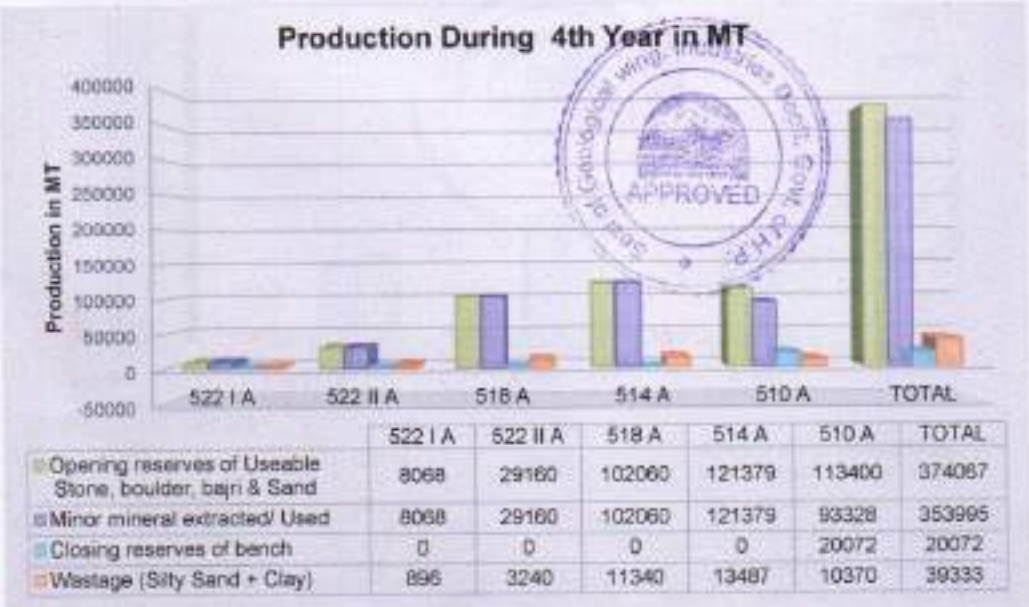
4.3 (D) DEVELOPMENT AND PRODUCTION AT THE END OF THE 4TH YEAR (PLATE NO.-11)

During this year 353995 metric tonnes of Stone, Boulder, Bajri & Sand production is proposed to meet the requirement of the stone crusher unit. In order to meet the above requirement of minor mineral, it shall be extracted from left out bench of 522 I A mR.L (522 I A) and new benches in Block A at 522 II A mR.L. (522 II A), 518 A mR.L., 514 A mR.L. & 510 A mR.L. shall be opened. The benches at 522 I A mR.L (522 I A), 522 II A mR.L. (522 II A), 518 A mR.L. & 514 A mR.L. shall be completely exploited and the bench at 510 A mR.L. shall be partially exhausted and the remaining material from this bench would be exploited during the next year of working. The top soil shall be dumped at soil Dump S-4 and top soil from Soil dump S-3 shall be spread over the exhausted bench. Re-grassing and Plantation shall be raised over this bench by growing bushes and trees at 'P-4 location. A check dam will be constructed with the length of 08 meters at C-4 locations and the mining waste material shall be dumped at D.Y. as shown in plate No-11.

Table showing activity during the 4th year

Production Of Each Mineral in Fourth Year (In MT)						
Bench	Duration	Rl of Bench	Opening reserves of Useable Stone, boulder, bajri & Sand	Minor mineral extracted/ Used	Closing reserves of bench	Wastage (Silty Sand + Clay)
No.	In Year	In meters	In MT	In MT	In MT	In MT
9, 10, 11, 12 & 13	Fourth Year	522 I A	8068	8068	0	896
		522 II A	29160	29160	0	3240
		518 A	102060	102060	0	11340
		514 A	121379	121379	0	13487
		510 A	113400	93328	20072	10370
		TOTAL	**374067**	**353995**	**20072**	**39333**

Graph Showing Reserves during 4th Year



	522 I A	522 II A	518 A	514 A	510 A	TOTAL
Opening reserves of Useable Stone, boulder, bajri & Sand	8068	29160	102060	121379	113400	374067
Minor mineral extracted/ Used	8068	29160	102060	121379	93328	353995
Closing reserves of bench	0	0	0	0	20072	20072
Wastage (Silty Sand + Clay)	896	3240	11340	13487	10370	39333

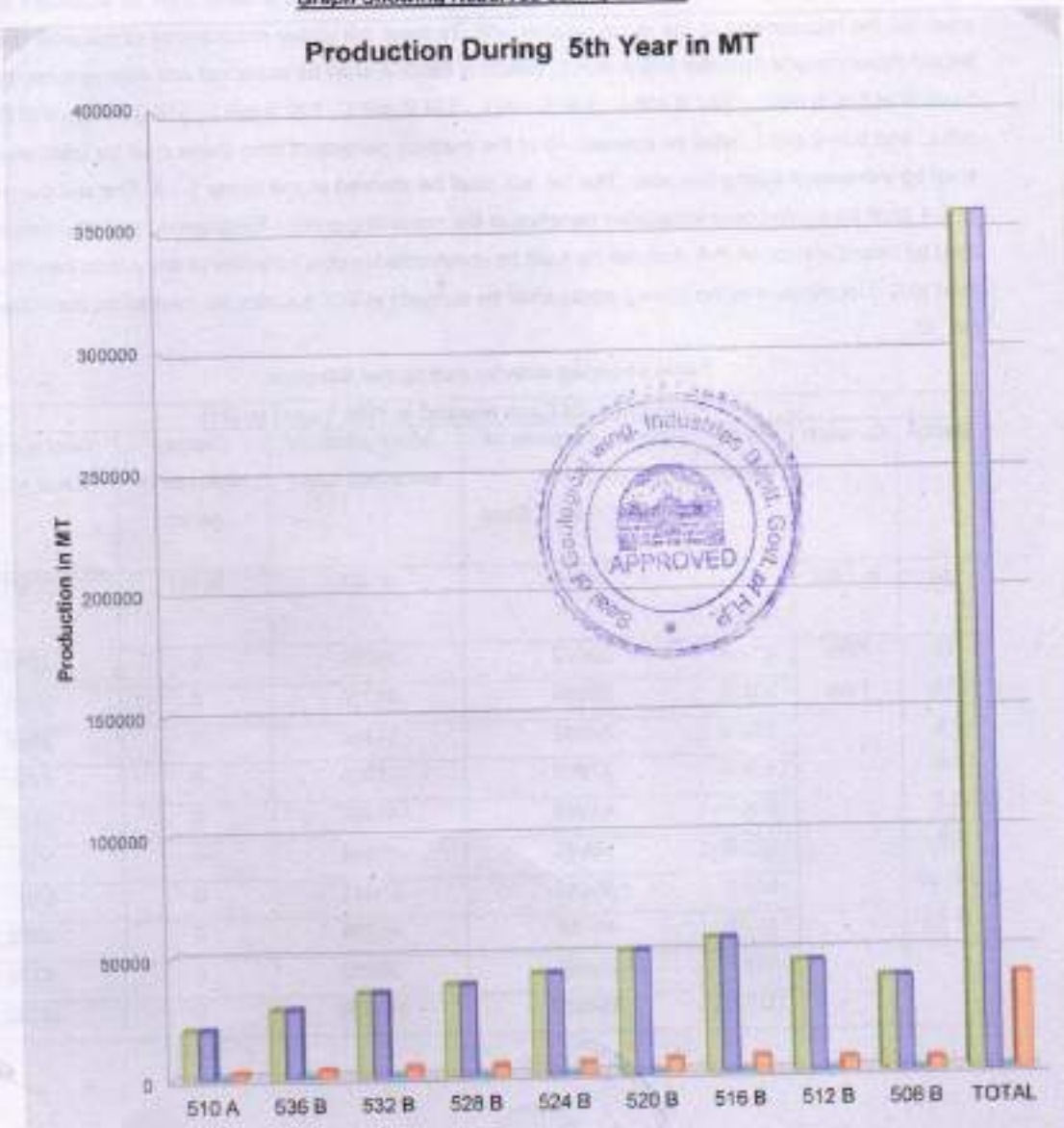
4.3(E) DEVELOPMENT AND PRODUCTION AT THE END OF THE 5TH YEAR (PLATE NO.-12)

During this year 354258 metric tonnes of Stone, Boulder, Bajri & Sand shall be produced to meet out the requirement of the stone crusher unit. To meet the above requirement of material, the left out minor mineral from the 510 A m.R.L. bench of Block A shall be extracted and new benches in Block B at 536 B mR.L., 532 B mR.L., 528 B mR.L., 524 B mR.L., 520 B mR.L, 516 B mR.L., 512 B mR.L. and 508 B mR.L. shall be opened. All of the material generated from these shall be used and shall be exhausted during this year. The top soil shall be stacked at soil dump S - 5. The soil dump at S-4 shall be spread over exhausted benches in the remaining portion Re-grassing and Plantation shall be raised at location P-5. A check dam will be constructed to check the flow of any debris towards road at C-5 locations and the mining waste shall be dumped at D.Y. location as marked on the Plate No. 12.

Table showing activity during the 5th year

Production Of Each Mineral in Fifth Year (In MT)						
Bench	Duration	Rl of Bench	Opening reserves of Useable Stone, boulder, bajri & Sand	Minor mineral extracted/ Used	Closing reserves of bench	Wastage (Silty Sand + Clay)
No.	In Year	In meters	In MT	In MT	In MT	In MT
13, 14, 15, 16, 17, 18, 19, 20 & 21	Fifth Year	510 A	20072	20072	0	2230
		536 B	28350	28350	0	3150
		532 B	34992	34992	0	3888
		528 B	37908	37908	0	4212
		524 B	41958	41958	0	4662
		520 B	50949	50949	0	5661
		516 B	55445	55445	0	6161
		512 B	45704	45704	0	5078
		508 B	38880	38880	0	4320
		TOTAL	**354258**	**354258**	**0**	**39362**

Graph Showing Reserves during 5th Year

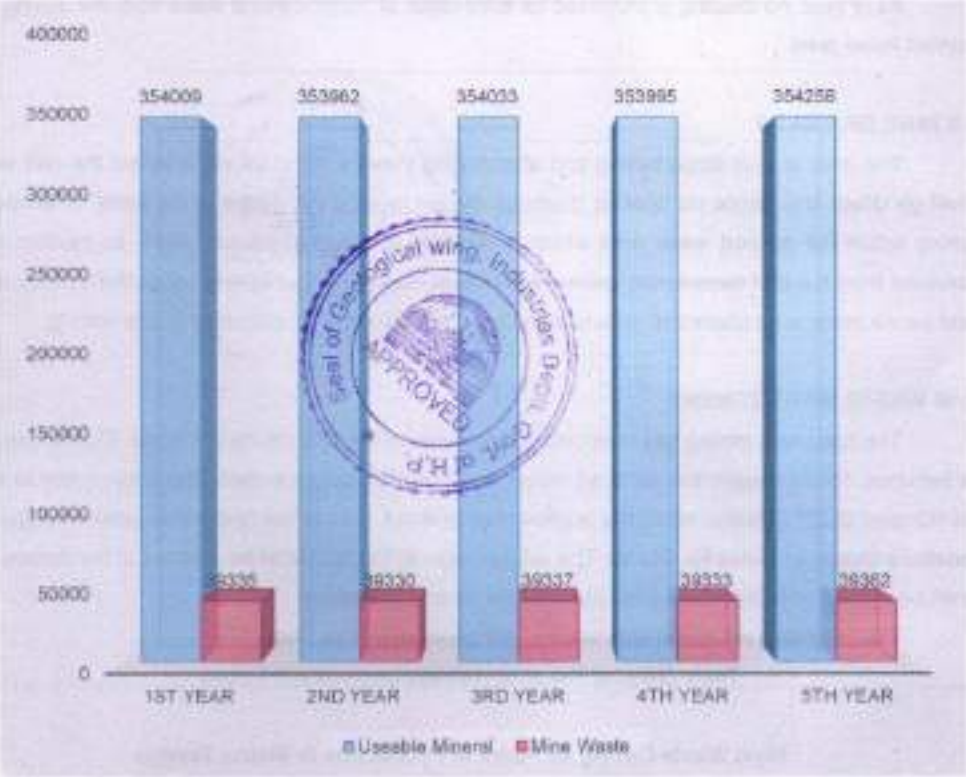


	510 A	536 B	532 B	528 B	524 B	520 B	516 B	512 B	508 B	TOTAL
Opening reserves of Useable Stone, boulder, bajri & Sand	20072	26350	34992	37908	41958	50949	55445	45704	38880	354258
Minor mineral extracted/ Used	20072	26350	34992	37908	41958	50949	55445	45704	38880	354258
Closing reserves of bench	0	0	0	0	0	0	0	0	0	0
Wastage (Silty Sand + Clay)	2230	3150	3886	4212	4662	5661	6161	5078	4320	39362

4.4 PROPOSED RATE OF PRODUCTION OF MINERALS (INCLUDING WASTAGE) WHEN MINE IS FULLY DEVELOPED AND THE EXPECTED LIFE OF THE MINE AFTER ITS OPENING:

Rate of Production when Mine is Fully Developed in Metric Tonnes					
YEAR	1ST YEAR	2ND YEAR	3RD YEAR	4TH YEAR	5TH YEAR
Useable Mineral	354009	353962	354033	353995	354258
Mine Waste	39335	39330	39337	39333	39362
Total	393344	393292	393370	393328	393620

Graph Showing Rate of Production of Mineral and Mine Waste (In Metric Tonnes) when mine is fully developed



4.5 BALANCE MATERIAL AVAILABLE IN THE AREA AFTER FIVE YEARS OF PROGRESSIVE MINING AND ESTIMATED YEAR OF MINE CLOSURE:

As per the reserves calculated in the applied mining lease area, approximately 1966952 metric tonnes of proved material (including waste) is available which shall be utilized in 5 years at the proposed production rate. Whole mineral will be utilized in five years if, the mining lease holder shall work as per the proposed production, the life of mine would be 5 years.

4.6 SALIENT FEATURE OF MODE OF WORKING

The mining shall be done mechanically by using excavators/poclains/Back Hoe Loaders as well as manually by developing 4 meters face height benches. No blasting shall be carried out without the permission from the competent authorities.

4.7 EXTENT OF MECHANIZATION

The material shall be extracted with the help of mechanical excavator like back hoe loader or chain mounted excavator as well as by the manual labour.

4.8 BLASTING

As of now, no blasting is proposed for excavation of minor mineral stone from the mining applied lease area.

4.9 MINE DRAINAGE

The area is a hill slope having and after mining there is sufficient slope where the rain water shall go down and hence no specific drainage design is required. There is no water or seepage/ spring within the applied lease area which is required to be channelized. Also, as per the data obtained from the IPH department ground water level is about 100-120 feet below the surface level and hence there is no chance of ground water level encountered or disturbed due to mining.

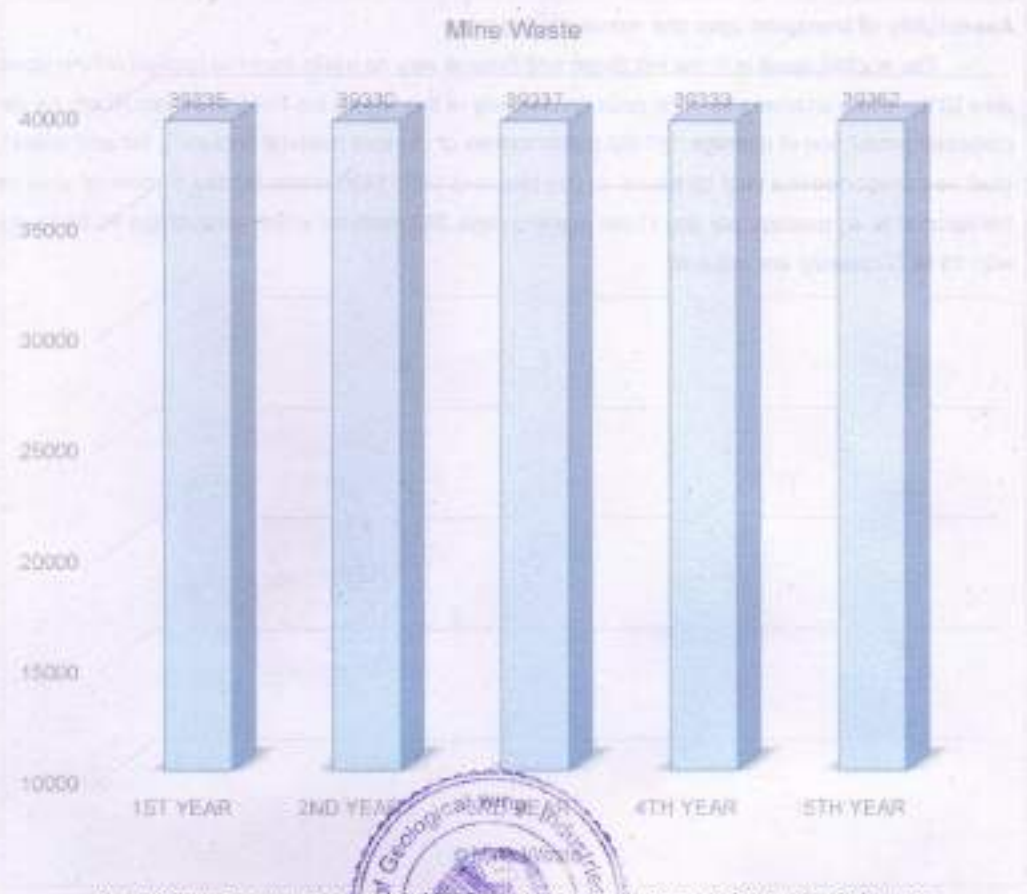
4.10 WASTE MANAGEMENT

The open cast mining has been proposed in view of the hilly nature of the site. During opening of benches, 196697 Metric tonnes of silt mixed clay/ soil shall be generated. The waste material shall be dumped at DY (Waste) within the applied mining lease area in the respective year-wise specific locations shown as plates No 8 to 12. The waste material/Top Soil shall be dumped in the dumps and shall be spread over the worked-out benches for raising plantation.

The year wise silt mixed clay and top soil generated is as under.

Table Showing Yea wise Wastage generated in 5 years

Mine Waste During 05 Years of Production in Metric Tonnes					
YEAR	1ST YEAR	2ND YEAR	3RD YEAR	4TH YEAR	5TH YEAR
Mine Waste	39335	39330	39337	39333	39362



Graph Showing year wise Top Soil generated during 5 years period in Metric Tonnes

A part of this material could be marketable as filling material as per demand. However, the remaining material which is not marketable shall be dumped or spread over the benches for plantation or for development of agriculture fields.

4.11 END USE OF MINERALS

The extracted Stone shall be used in the already established Stone Crusher unit of the applicant in the name and style as "**M/s Lakhwinder Singh Stone Crusher and Screening Plant Unit-I**" unit for manufacturing of Grit and manufactured Sand (M-Sand).

4.12 DETAILS OF DENSITY OF ROAD TRANSPORTATION OF MINERALS

The mining site is located in the form of Hill Slope besides the village Kutharbeet. The main connectivity of this site is through Janani- Polian Road in village Kutharbeet which is sufficiently good in condition to bear this additional traffic load.

Assecibility of transport upto the mining lease area

The applied lease is in the Hill Slope and there is very no traffic from the applied mining lease area till the stone crusher site. The main connectivity of this is with the Polian - Janani Road. As per proposed production of average 393390 metric tonnes of useable material (including Silt and waste), shall be transported in a year by trucks. At this rate only 1400-1450 metric tonnes of material shall be transported at an average per day (Total working days 280/year) for which an average 90-95 trucks with 15 M.T. capacity are required.

PART –II
ENVIRONMENT MANAGEMENT PLAN

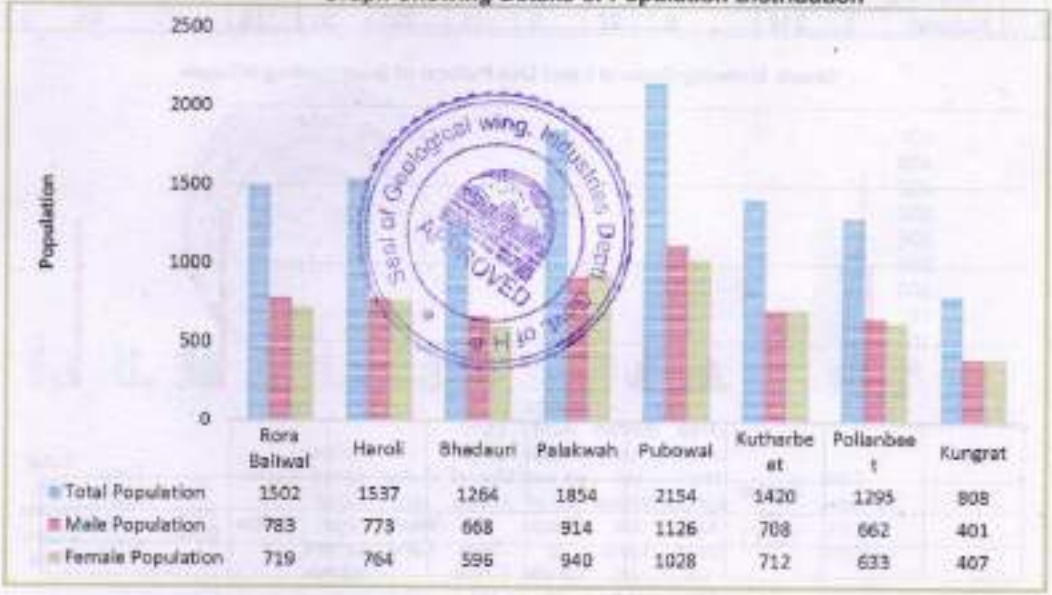
(1) BASE LINE DATA

1.1. Detail of Population Distribution

Table Showing Details of Population Distribution

Sr. No.	Name of Villages	Total Population	Male Population	Female Population
1	Rora Baliwal	1502	783	719
2	Haroli	1537	773	764
3	Bhadauri	1264	668	596
4	Palakwah	1854	914	940
5	Pubowal	2154	1126	1028
6	Kutharbeet	1420	708	712
7	Polianbeet	1295	662	633
8	Kungrat	808	401	407

Graph Showing Details of Population Distribution



1.2 SOCIO ECONOMY OF THE VILLAGE:

The general economy of the village in agriculture and animal husbandry based and people go to find out job opportunities in far flung industrial area outside the state of Himachal as there is no industry in the nearby are. Therefore, any job opportunity created by any entrepreneur may be of small magnitude shall add to the economy of the people. The people who are offered job in the mining shall be a local employment at the door and such worker in the off hours, shall be able to look after their retinue agriculture and livestock.

1.3 LAND USE DETAIL WITH 5 KMS.RADIUS: (ENCLOSED AS PLATE NO. – II)

Table Showing Details of the Land use Pattern of the Surrounding Villages

Sr. No.	Name of Villages	Total area (in Hect.)	Forest (in Hect.)	Area under Non-agricultural Uses (in Hect.)	Barren and Un-cultivable Land (in Hect.)	Permanent Pastures and Other Grazing Lands(in	Land Under Miscellaneous Tree Crops etc.	Culturable Waste Land	Fallow lands other than current fallows	Current Fallows	Net Area Sown	Total Irrigated Land Area	Total Un-irrigated Land Area
1	Rora Baliwal	251.19	0	19.2	1.8	293	4	56	35	2	350	20	330
2	Haroli	437	0	59	100	57	0	100	50	1	70	5	65
3	Bhadauri	285.3	0	67	60	16	28	26	0	0	88.3	78	10.3
4	Palakwah	217.76	0	52.7	30.1	0	8.1	30.2	23	20	53.8	15	38.7
5	Pubowal	251.19	0	0	0	49.6	106.7	0	3.4	0	91.4	91.4	0
6	Kutharbeet	344.34	0	52.9	0	0	0	93.7	90	0	107.8	0	107.8
7	Polianbeet	389.06	0	0	20	71	7	197	0	27.1	67	0	67
8	Kungrat	319	0	27	0	11	203	51	19	0	8	0	8

Graph Showing General Land Use Pattern of Surrounding Villages

	Total area (in Hect.)	Forest (in Hect.)	Area under Non-agricultural Uses (in Hect.)	Barren and Un-cultivable Land (in Hect.)	Permanent Pastures and Other Grazing Lands(in Hect.)	Land Under Miscellaneous Tree Crops etc.	Culturable Waste Land	Fallow lands other than current fallows	Current Fallows	Net Area Sown	Total Irrigated Land Area	Total Un-irrigated Land Area
Rora Baliwal	251.19	0	19.2	1.8	293	4	56	35	2	350	20	330
Haroli	437	0	59	100	57	0	100	50	1	70	5	65
Bhadauri	285.3	0	67	60	16	28	26	0	0	88.3	78	10.3
Palakwah	217.76	0	52.7	30.1	0	8.1	30.2	23	20	53.8	15	38.7
Pubowal	251.19	0	0	0	49.6	106.7	0	3.4	0	91.4	91.4	0
Kutharbeet	344.34	0	52.9	0	0	0	93.7	90	0	107.8	0	107.8
Polianbeet	389.06	0	0	20	71	7	197	0	27.1	67	0	67
Kungrat	319	0	27	0	11	203	51	19	0	8	0	8

The fact file of the district, classified the land available in district Una into 7 categories as shown below:

Table 1.21 Table showing different categories land available in district Una

	GEOGRAPHICAL AREA	1549 m^2
1	FOREST AREA	185 m^2
2	CULTIVATED AREA	430 m^2
3	BARREN & UNCULTURABLE LANDS	226.7 m^2
4	LAND PUT TO NON AGRICULTURAL USES	294 m^2
5	PERMANENT PASTURES & OTHER GRASS LANDS	129.4 m^2
6	LAND UNDER MISC TREE ,CROPS AND GROVES	55.4 m^2
7	IRRIGATED AREA	78.4 m^2

Graph Showing General Land Use Pattern of Surrounding Villages

1.4 AGRICULTURE

Agriculture is the main occupation of the people of the district. It provides direct employment to the major chunk of the working population. The department of Agriculture continued its endeavours to bring more area under high yielding varieties of major cereals. Keeping in view the requirement of disease free and quality seeds, a seed mortification farm at Pekhubela was started in the district during the year 1974 since then seeds such as wheat, maize, pulses, soya bean, barley, toria and sunflower etc. are being supplied to the farmers. For maintaining the quality of seeds, H.P. seeds certification agency has its agency functioning in the district since 1978-79. H.P. Agricultural University, Palampur is running one of its research centre in the district at Akhrot. The supply of fertilizers is arranged by the Area Manager of HIMFED, who in turn supplies fertilizers to District Co-Op. Marketing and Consumers Federation Ltd. Una. The economy is mostly agrarian and majority of population depend on agriculture and activities allied to it for earning their lively hood. The most of the land is un-irrigated and depends upon the rainy season. The part of the lands are irrigated and the irrigation facilities are provided by lifting water from streams, shallow Dug wells and medium to deep tube wells in the valley area.

The farmers grow more than two crops in a year so as to get maximum production from the land. The crop rotation followed in the district is:

I. Maize- Toria-Wheat
II. Maize-Potato-Potato
III. Maize- Toria-Wheat-Baisakhi Moong
IV Paddy Wheat
V Maize-Wheat

Wheat and Maize are major crops of the district. These are followed by gram, Paddy and other pulses. Besides these, Barley, Ragi, Mustered, Seasmum and Sugarcane are also grown in the district. Peas, Carrot, Cabbage, Ladyfinger, Tomato, Brinjal, Capsicum, Cauliflower, Cucumber, Pumpkin etc. Vegetables are also grown. About 95% of the total cultivable area in the district is rain fed. Hence production of the district mainly depends upon rain.

Table showing various agriculture crops in District Una

June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Maize				Wheat				Maize			
Maize			Toria			Wheat			Maize		
Maize			Potato			Wheat			Maize		
Maize			Potato			Potato			Maize		

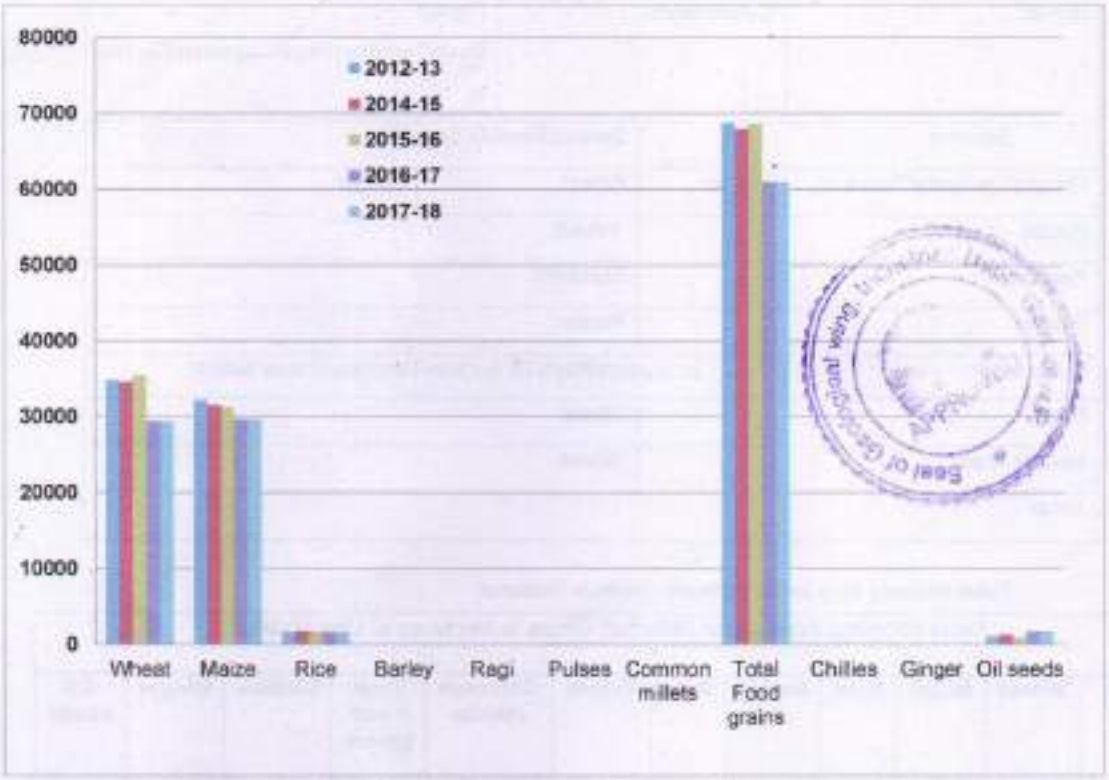
Bhindi	Cauliflower	French Bean/Tomato/brinjal/CapsicumCucubits	
Sesame		Sarson/Raya/G.Sarson	
Ginger/Caucasia/Turmeric	Potato	Wheat	Ginger
Paddy		Wheat	
Paddy		Barseem	
Paddy		Potato	
Kulthi Mash		B. Sarson/Raya/G. Sarson/Taramira(Eruca Sativa)	
Mash		Wheat	
Maize+ Mash		Wheat	
Arhar			

Table showing area under Different Crops in Hectares

Table showing Area under Different Crops in Hectares at Una District

Year	Wheat	Maize	Rice	Barley	Ragi	Pulses	Common millets	Total Food grains	Chillies	Ginger	Oil seeds
2012-13	34836	32157	1587	...	...	192	...	68772	8	1	1113
2014-15	34587	31548	1663	2	...	155	...	67955	8	2	1343
2015-16	35497	31279	1685	...	...	151	...	68612	2	2	888
2016-17	29476	29716	1600	...	...	172	...	60964	3	3	1706
2017-18	29476	29716	1600	...	...	172	...	60964	3	3	1706

Source: Directorate of Land Records, HP

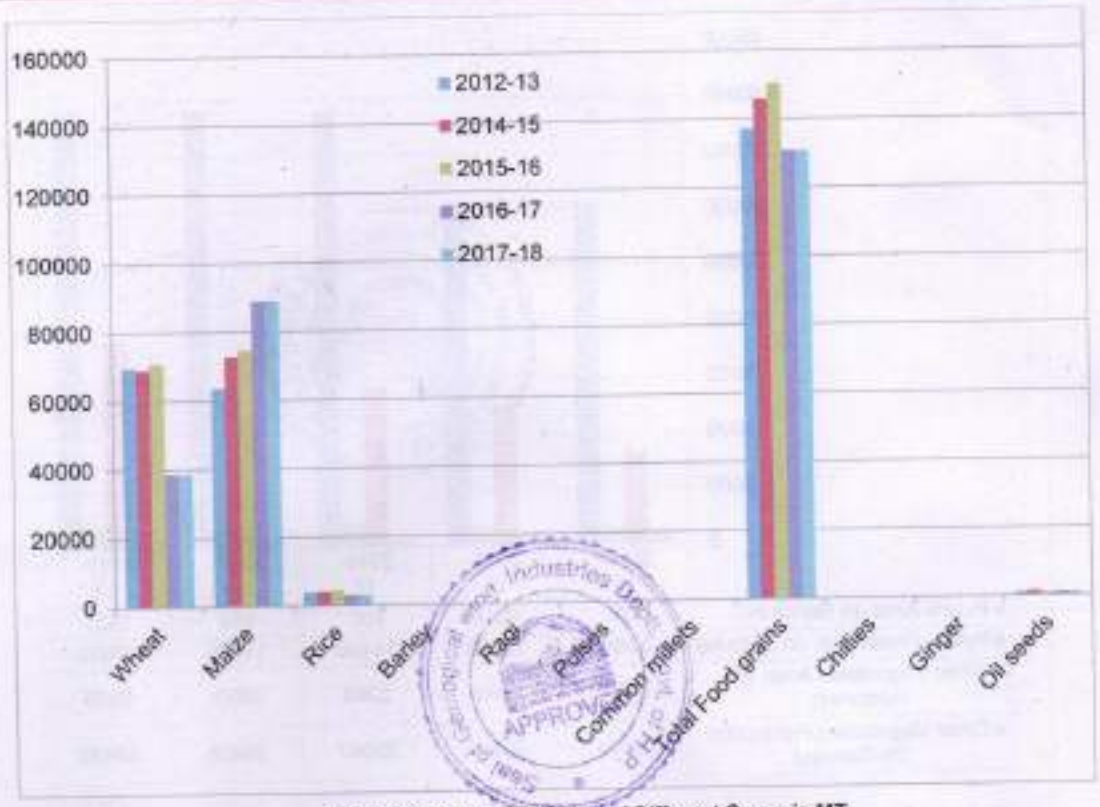


Graph Showing Area under Different Crops in Hectares

Table showing Production of Different Crops in MT

Table showing Production of Different Crops in MT at Una District											
Year	Wheat	Maize	Rice	Barley	Ragi	Pulses	Common millets	Total Food grains	Chillies	Ginger	Oil seeds
2012-13	69667	63630	3720	...	...	122	...	137139	4	7	963
2014-15	69039	72673	3838	3	...	97	...	145650	4	14	1281
2015-16	70855	74789	4346	...	...	125	...	150115	1	14	870
2016-17	38603	89057	2985	...	...	147	...	130792	1	15	1039
2017-18	38603	89057	2985	...	...	148	...	130792	1	15	1039

Source: Directorate of Land Records, HP



Graph Showing Production of Different Crops in MT

Table showing Area & Production of Vegetables in Tonnes

Area & Production of Vegetables (District - Una)				
Year	Potato		Other Vegetables	
	Area (In Hectares)	Production (In Tonnes)	Area (In Hectares)	Production (In Tonnes)
2014-15	770	8350	1634	30801
2015-16	1000	12500	1647	30801
2016-17	600	14400	2285	39067
2017-18	980	11760	2331	39426
2018-19	1431	18610	2353	39428

Source: *Directorate of Land Records, HP*

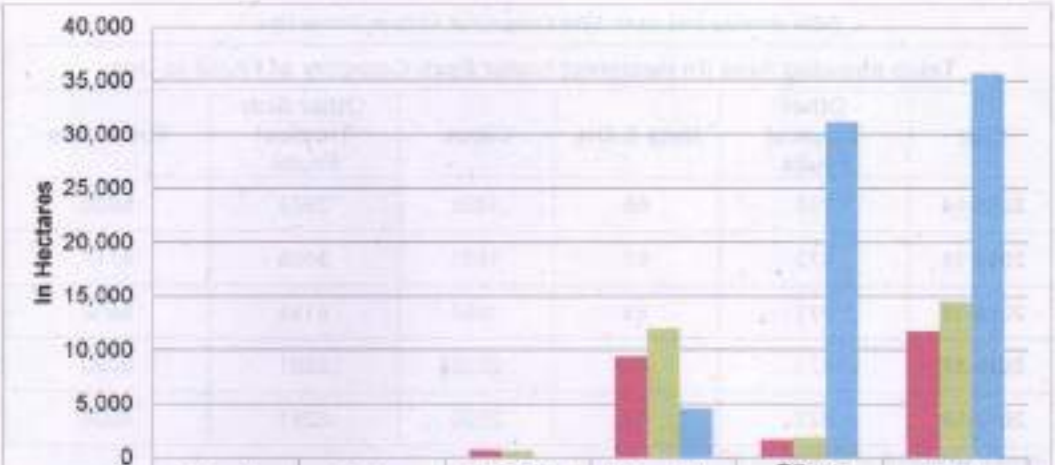
	2014-15	2015-16	2016-17	2017-18	2018-19
Potato Area (In Hectares)	770	1000	600	980	1431
Potato Production (In Tonnes)	8350	12500	14400	11760	18610
Other Vegetables Area (In Hectares)	1634	1647	2285	2331	2353
Other Vegetables Production (In Tonnes)	30801	30801	39067	39428	39428

Graph showing production of vegetables in District Una

Table showing Net Irrigated Area of Una District by source in Hectares

Table showing Net Irrigated Area of Una District by source in Hectares						
Year	Canals	Tanks	Other Wells	Tube Wells	Others Source	Total
2010-11	...	29	657	9401	1627	11714
2011-12	...	4	599	12010	1864	14477
2016-17	11	...	...	4514	31162	35687

Source: Directorate of Land Records, HP



	Canals	Tanks	Other Wells	Tube Wells	Others Source	Total
2010-11	0	29	657	9401	1627	11714
2011-12	0	4	598	12010	1864	14477
2016-17	11	0	0	4514	31162	35687

Showing Net Irrigated Area of the District Una during 2010 to 2017

1.5 HORTICULTURE

In Una district there is a vast scope in the field of development of horticulture activity and the department of horticulture is engaged to popularise the horticulture in the district. During the 1980-81, 1,335 hectares of land was under horticulture which rose to 3,468 hectares in 1988-89. 113,730 fruit plants of various varieties were distributed on subsidized rates to farmers in 1988-89. Thus number was much high in comparison to 69,394 plants distributed in 1980-81. During the year 1985-86 Horticulture Department recorded 766 tonne of production in various fruit crops which went up to 2220 tonnes in 1988-89.

Main fruit crops which are grown in the district are citrus. Mango, guava and pear besides other subtropical fruits. Department provides technical guidance to the farmers at the block level. Pesticides and fertilizers are being supplied by the Agriculture department through co-operative societies. In the district there is only one Progeny-cum-demonstration orchard at Saloh which is having an area of 34.29 hectares

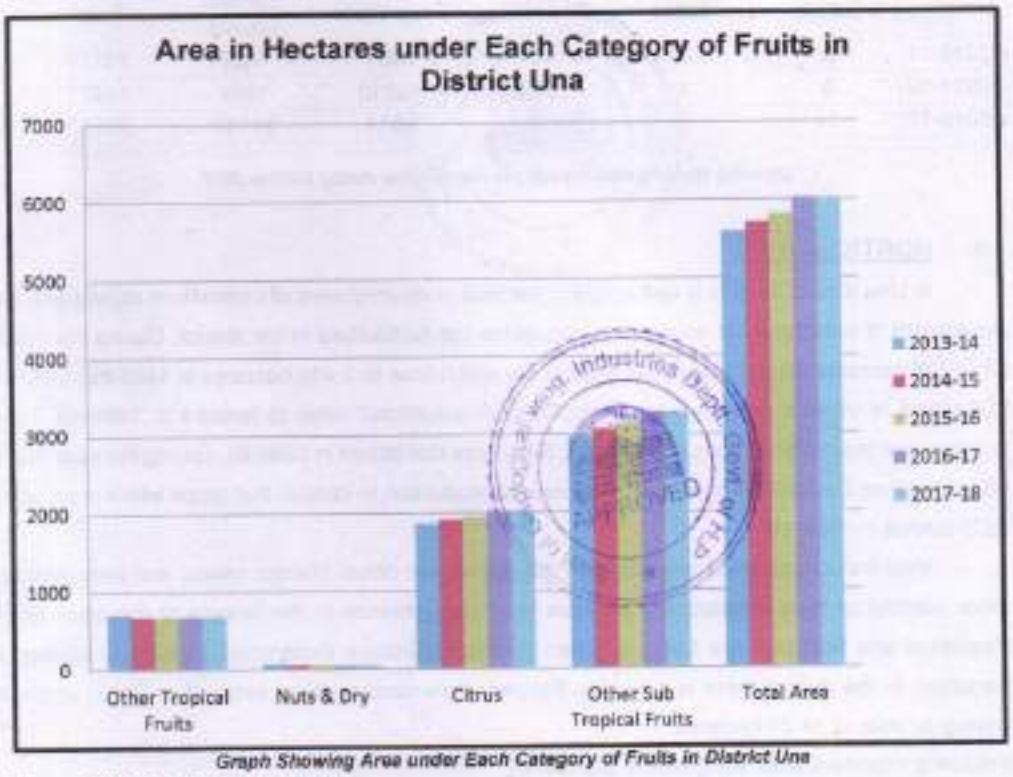
Following important fruits are grown in the district

I	Plum	II.	Peach
III.	Apricot	IV.	Pear
V	Nuts and dry fruits	VI	Citrus fruits
VII.	Sub Tropical fruits like Mango, Guava, Lichi, Papaya etc.		

Table showing area under Each Category of Fruits in District Una

Table showing Area (In Hectares) under Each Category of Fruits in Una					
Year	Other Tropical Fruits	Nuts & Dry	Citrus	Other Sub Tropical Fruits	Total Area
2013-14	707	66	1860	2973	5606
2014-15	673	57	1921	3066	5717
2015-16	671	53	1950	3145	5819
2016-17	671	48	2020	3281	6020
2017-18	671	48	2020	3281	6020

Source: *Directorate of Horticulture, HP*



Graph Showing Area under Each Category of Fruits in District Una

1.6 ANIMAL HUSBANDRY

Economy of the district is predominantly agrarian but the role of Animal Husbandry is equally important as the farmers have to keep the cattle for the purpose of ploughing manure for maintaining fertility of the fields and to meet the daily need of milk of their family. Livestock rearing forms the backbone of the agriculturists of this

District. Major chunk of the population of the District depends wholly on Agriculture and animal husbandry.

The Department Animal husbandry is putting their best efforts to improve the potential of livestock and poultry in the district through treatment, management feeding and artificial insemination, and distribution of improved breeds. To provide the farmers with the veterinary facilities the department has established 13 veterinary hospitals, 27 veterinary dispensaries, 3 sub-centers, 4 veterinary check posts, one mobile dispensary and 2 sub-centers. Veterinary check posts to undertake vaccination of all the livestock entering the State against Rinderpest which is a highly fatal disease of cattle. To improve the existing breeds of cattle particularly buffaloes 31 veterinary institutions provide artificial insemination services. Scarcity of fodder in the District is the main hindrance of the farmers for rearing the animals. To solve this problem the farmer have been educated to utilize the edges of their fields for fodder to increase the production of fodder oats, maize, and barseem seeds have been distributed free of cost to the respective seasons.

Poultry farm at Ajouli, which prior to 1969 was managed by the Panchayat Samiti is under the control of department of Animal Husbandry. To make the poultry more popular at Ajouli- Farm, which is about 16kilometers from the district headquarter has distributed 5,780 layers and 8,096 broilers to the farmers during the year 1989-90. This farms not only has trained 62 young farmers in poultry productions, and management but has also provided regular vaccination against common diseases and spraying with insecticides to control ecto-parasites in private poultry farms through the staff. The milk production in the State has increased manifolds in the recent years. As per the livestock Census Himachal Pradesh during 1987, 1992 and 1997 is given the

Following livestock in the district:

I. Cow
II. Ox
III. Buffalo
IV. Sheep
V Goat
VI Ponies

Following are important poultry birds:

I. Fowl
II. Ducks (Rare)

Table showing Livestock census of District Una

Animal Husbandry Population in District Una										
Year	Status	Period/Cattle				Buffaloes		Sheep	Goats	Horse & Ponies
		Crossbreed		Indigenous		Male	Female			
		Bulls	Cows	Bulls	Cows					
2012	At Una	7407	32035	8050	4104	11627	111460	61	13569	267

Source: Directorate of Animal Husbandry, HP

Graph Showing Livestock census of the Una District

Table showing other Livestock census of District Una

Other Livestock							
Mules	Donkeys	Camels	Pigs	Yaks	Others	Poultry	Dogs
69	91	12	95	63	12	73435	19017

Source: Directorate of Animal Husbandry, HP

Graph Showing other Livestock census of the Una District

1.7 FISHERIES

Una is a foot hill district with arid zone and scanty rains. In natural fisheries resources, this district comprises of a portion of Gobind Sagar reservoir falling in the District. Lunkar Khad spread from Dumkhar to Bhakra from where considerable fish production is achieved.

There are about 130 seasonal and perennial ponds measuring about 65 hectares area in the district which has been brought under the fish culture through different schemes. To popularize the fish culture in the district ,training have been imparted to fish farmers at, this Seed Farm Deoli in Bilaspur district and at various places fish farmers training camps were organized by Fish Farmers Development Agency.

For the development of ponds/tanks three programmes were launched by the Department i.e. (i) Special Scheduled Caste Component plan programme (ii) Low Income group assistance programme for other castes and (iii) Fish Farmers Development Agency (FFDA) Programme.

Major chunk of the most productive area of Gobindsagar reservoir-LathianiKhad spread from Dumkhar to Bhakra falls in this district from where considerable fish production is achieved. The fishery of GobindSagar is exploited by the members of Kutlehar. Lathiani and Mandli Co-operative societies.

Table Showing Annual Production of Fisheries and Its Value of Catch in District Una

Table showing Annual Production of Fisheries at Una District		
YEAR WISE	TOTAL PRODUCTION (IN MT)	VALUE OF FISH PRODUCED (IN LAKHS)
2014-15	696.00	556.80
2015-16	800.00	640.00
2016-17	920.04	736.08
2017-18	1106.12	1106.12
2018-19	1565.22	1565.17

Source: Fisheries Department, HP

Graph Showing Annual Production of Fisheries and Its Value of Catch in District Una

1.8 FLORA

The Tract of Una forest division is bounded on north by Gular Dhar-Chintpurni ridge east by SolasingliDharHamirpur forest Division and Jagir forest and south and west by state boundary of Punjab, total forest area of una district is 52036 Hects. Out of which 28815 Hects falls under Una Forest Division and 23231 hectares under KutleharJagir forest. In Una district much of the plantation of Chil (khair and Eculyptus have been raised successfully. For working in the government reserve forests 4 working circles namely the Una Chil Working Circle, the Una Coppice Working Circle, the Khairover lapping Working Circle and the Protection Working Circle have been constituted. The following most prominent varieties of trees are found in the different elevation.

Table showing most prominent varieties of trees in the area

	Name of tree	Scientific name
1	Mango	(Magniferaindica)
2	Tali	(Dalbergiasisoo))
3	Pipal	(Ficusreligiosa)
4	Behul	(Grewiaoppsitifolia)
5	Chil	(Pinus Rose burghi)
6	Simbal	(Bomberemalabancuth)
7	Tuni	(Cedrelatoona)
8	Jamun	(Engenisjambolana)
9	Bamboo	
10	Brah	
11	Tos	

Broad leaf species

Ber and other bushes

Table Showing classification of forest area (in sq.km.) of district Una

CLASSIFICATION OF FOREST AREA (IN SQ.KM.) OF UNA DISTRICT						
YEAR	RESERVED FOREST	DEMARACATED PROTECTED FORESTS	UN-DEMARACATED PROTECTED FORESTS	UNCLASSIFIED FORESTS	OTHERS FORESTS	TOTAL
2012-13	44	48	131	...	264	487
2013-14	44	48	131	...	264	487
2015-16	44	48	131	...	264	487
2016-17	44	48	131	...	264	487
2017-18	44	44	124	...	...	212

Source: Forest Department, HP

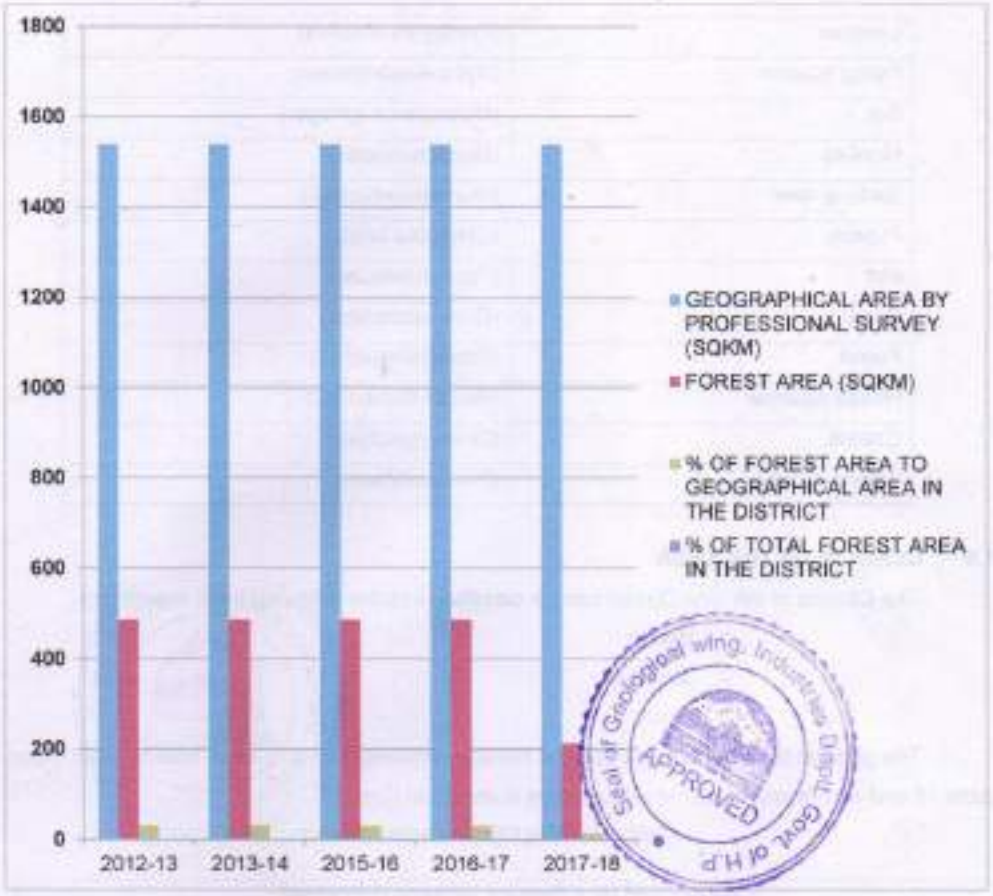
	RESERVED FOREST	DEMARACATED PROTECTED FORESTS	UN-DEMARACATED PROTECTED FORESTS	UNCLASSIFIED FORESTS	OTHERS FORESTS	TOTAL
2012-13	44	48	131	0	264	487
2013-14	44	48	131	0	264	487
2015-16	44	48	131	0	264	487
2016-17	44	48	131	0	264	487
2017-18	44	44	124	0	0	212

Graph showing classification of forest area (in sq.km.) of district Una

Table showing forest area of District Una

FOREST AREA OF UNA DISTRICT				
YEAR	GEOGRAPHICAL AREA BY PROFESSIONAL SURVEY (SQKM)	FOREST AREA (SQKM)	% OF FOREST AREA TO GEOGRAPHICAL AREA IN THE DISTRICT	% OF TOTAL FOREST AREA IN THE DISTRICT
2012-13	1540	487	31.6	1.3
2013-14	1540	487	31.6	1.3
2015-16	1540	487	31.6	1.3
2016-17	1540	487	31.6	1.3
2017-18	1540	212	13.77	0.56

Source: Forest Department, HP



Graph showing forest area (in sq.km.) of district Una

Fauna

The wildlife in an area is directly related to characteristics of the habitat i.e. availability of the food and water, nature and density of flora prevalent in the area along with other factors like slope, Climate, prevalent anthropogenic activities etc. Variation of altitude and slope in the study area has resulted in the proliferation of fauna which adopts with the ruggedness and hard climatic conditions. Due to diverse flora, climate and altitude, the area possesses well unique variety of Himalayan wildlife species. Due to wide variations in the altitude, a large variety of fauna is available in the forest of the district. The thick forest and climate of the district is the best for survival of many animals and birds. The following common animals and birds are found in the Una district:

Table showing Fauna in Una district

Samber	(Cerveus unicolor)
Leopard	(Felisbengalensis)
Hare	(Lepus nigricollies)
Fox	(Vaulepusbengalanesis)

Langoor	(Preshytes entellus)
Flying squirrel	(Hylopetusfimbriatus
Bat	(Hippsideros armiger)
Monkey	(Macacamulatta)
Barking deer	(Munteicusmuntisk)
Pigeon	(Columbia livia)
Mor	(Payocrisslatus)
Crow	(Crovussplendes)
Parrot	(Prottaculakarneri)
House sparrow	(Parser domcrticus)
Cranes	(Grurs species)
Wood pecker	(PicoidesMacer)

1.9 CLIMATE OF THE AREA

The Climate of the Una District can be classified into the following three categories

1. Winter
2. Summer
3. Rainy

The general temperature, rainfall and humidity corresponding to each type is given below in table 10 and month-wise detail of temperature is shown in Graph

Table showing Climate in Una district

Climate of Una District, Himachal Pradesh				
Climate		Winter	Summer	Rainy
Period		Oct.-Mid March	Mid. March-June	July-September
Weather		Cool	Hot	Humid
Humidity		84%	55%	98%
Temperature	Max.	33.0 C	45.5 C	35.0 C
	Min	-3.5.0 C	8.0 C	14.0 C
Rainfall	Max.	82.0 mm	69.0 mm	175. 0 mm
	Min	1.0 mm	1.0 mm	1.0 mm

The terrain in general has profound influence on the temperatures of a region. The temperature generally rises from the beginning of March till June, which is the hottest month of the year with mean minimum and maximum temperature of 25.6°C to 44°C respectively. With the onset of monsoons by the end of the June temperature begins to fall. The drop in day temperature is much more than the drop in night temperature. The night temperature falls rapidly after the withdrawal of monsoons by mid-September. The month of January is cooler month with the mean maximum and

minimum temperature being 24°C and 1.7°C respectively. Under the influences of western disturbance, the temperature falls appreciably during winters and it may go even below 0° C.

Humidity is generally low throughout the year. During summer season, humidity is lowest 36 %. During monsoon months, it goes as high as 80-90%. The highest levels of humidity are observed in the month of August. The average humidity during synoptic hours is 53% and 62% respectively.

Table showing Climate in Una district

CLIMATE OF THE APPLIED MINING LEASE AREA DISTRICT UNA, HIMACHAL PRADESH			
CLIMATE	**WINTER**	**SUMMER**	**RAINY SEASON**
PERIOD	OCT.-MID MARCH	MID MARCH -JUNE	JULY-SEPTEMBER
Weather	Cool	Hot	Humid

(2) ENVIRONMENT MANAGEMENT PLAN

2.1 IMPACT ON AIR

The magnitude of mining is not very high and restricted to the limited area as such there is hardly any impact other than dust emission to smaller extent which can be controlled by sprinkling water on the working face so that the dust be suppressed.

2.2 IMPACT ON WATER

There is no water source such as well or spring near the applied lease area. The mining operations are being carried scientifically. Therefore, it has no adverse impact within the lease area after the mining operations; neither there is any kind of adverse impact within the lease area or below the lease which could be affected.

2.3 IMPACT ON NOISE LEVEL

The area is away from the habitation and the noise shall be caused only by plying tractors/tippers/trucks to bring mineral to the stone crusher site, which shall be kept under control by proper lubrication and the working would only be done during day time to keep noise level below the permissible limit prescribed. No blasting operations are involved as the process is only to lift the material manually/mechanically with the help of excavator and to load in tractors/tippers/trucks hence, the noise level will not exceed the required level.

2.4 WASTE DISPOSAL ARRANGEMENT, IF ANY

During the excavation of stone, boulder, bajri and sand from the Hill slope, silt, clay and soil shall also be quarried being associated with minerals. The total waste material which will be generated to the extent of 196697 metric tonnes in five years shall be separated from the useable mineral. The Top Soil shall be spread over the mined-out benches for growing plantation and re-

grassing of the area. Further, the applied mining lease holder is also a road contractor and he shall use the wastage dumped in the form of Silt, Clay and Silty Sand to manufacture Granular Sub Base (GSB) for road works.

2.5 SOCIO-ECONOMIC BENEFITS

The mining shall provide employment to approx. 25-30 local people who are unskilled and are in need of an additional source of income when they are free from agriculture engagements and shall be helpful in raising additional source of income.

2.6 TRANSPORT OF MINERAL

The applied mining site is located in the form of Hill Slope besides the village Kutharbeet. The main connectivity of this site is through Janani- Polian Road in village Kutharbeet which is sufficiently good in condition to bear this additional traffic load.

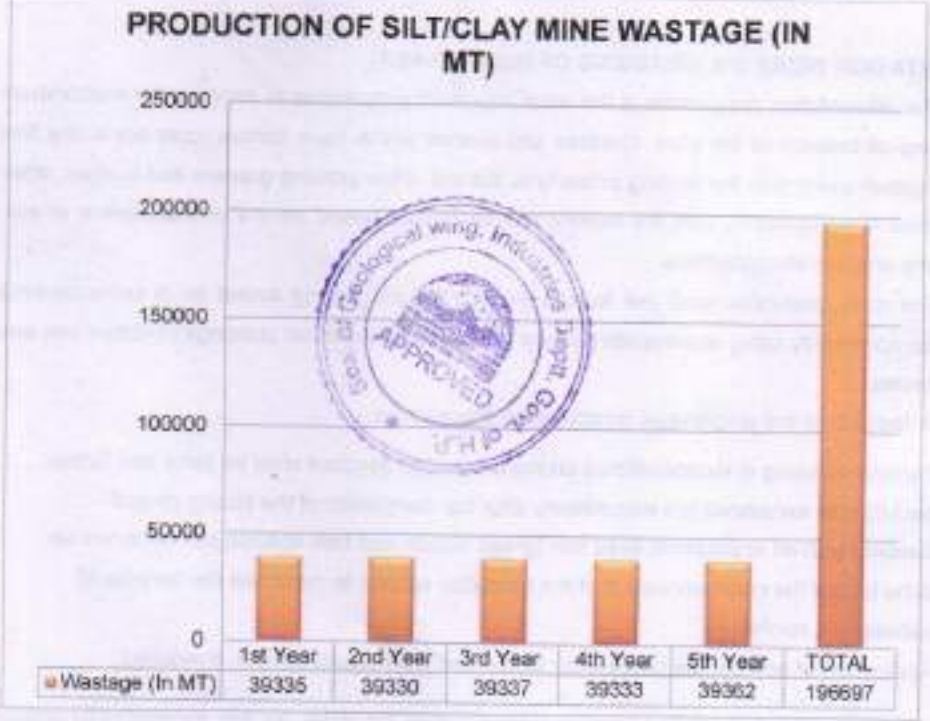
PART-III
PROGRESSIVE MINE CLOSURE PLAN/ RECLAMATION PLAN

1.1 MINE WASTE DISPOSAL

A) YEAR WISE GENERATION OF MINE WASTE

Production of mine waste during five years

Year	1st Year	2nd Year	3rd year	4th Year	5th year	TOTAL
Mine Wastage (Silt, Clay & Topsoil)	39335	39330	39337	39333	39362	196697



The waste material shall be used for the maintenance of the approach road of the applied mining lease and the stone crusher unit as well as the road from stone crusher unit connecting the main road.

B) COST OF MINE WASTE DISPOSAL:

The material shall be brought to the dump site by trucks as well as manually and it shall add little addition to the mining cost around Rs. 5/- per tonne of waste. The total waste production in 5 years is 196697 tonnes. The total cost of dumping shall be around Rs. 9,83,484/- in 5 years.

1.2 TOP SOIL ARRANGEMENT:

The top soil will be spread over the benches developed after mining for growing plantation.

1.3 PREVENTIVE RETAINING STRUCTURES

a. Five no's of retaining structures/Gabion/Check Dam structures of 08 meters length and 1.5 meters height has been proposed to be raised in five years marked in the respective year wise scheme in Plate No 8- 12.
b. Each retaining structures/Gabion/Check Dam structures shall cost Rs. 60,000 and total cost for construction of these in five years shall be 3,00,000.

1.4 PLANTATION WORK (RE-GRASSING OF MINING AREA)

The afforestation programme is the most important programme to improve the environment and ecological balance of the area. Grasses and bushes which have fibrous roots are at the first instance grown which give the binding property to the soil. After growing grasses and bushes, other tree species in consultation with the experts will be raised, based on the characteristics of soil, topography and climatic conditions.

The main post-mine land use for the Project will be grazing based on a self-sustaining vegetation community using appropriate pasture grasses and scattered plantings of native tree and shrub species.

The main features of the progressive rehabilitation process are:

1. Periodic stacking of topsoil/silt/clay on the excavated benches shall be done and further backfilled in excavated pits immediately after the completion of the Mining project.
2. Seeding with an appropriate seed mix (grass, shrub) and tree species plantation will be done before the commencement of the monsoon season to maximise the benefits of subsequent rainfall.
3. Application of appropriate fertiliser for Grass and plant establishment, if required.

The fast-growing plantation and re-grassing shall be done on the exhausted/excavated benches as well as in backfilled pits will be done in consultation of local peoples or Govt. Authorities like forest department etc. The applied mining lease shall be fenced properly in the entire periphery of the safety zone (As per the details given in Plate No. 13). The total mined out area of the benches shall be 198000 Sq.m. and this area shall be dedicated for plantation and re-grassing. The average year-wise proposed bench area for plantation is as under: -

Sr. No	Year	Area in Sq. Mts.	No. Of Plants
1	1st Year	39600	300
2	2nd year	39600	300
3	3rd year	39600	300
4	4th Year	39600	300
5	5th Year	39600	300
	Total	**198000**	**1500**

a) The plantation/regressing and its maintenance cost will be borne by the applicant. Also, a green belt will be developed in consultation with local panchayat and forest department along approach roads in order to minimize the pollution.

b) Based on the characteristics of soil, topography and climatic conditions of the area, plantation of grasses/bushes and other tree species will be done by the applicant.

c) Plantation before the onset of monsoon season will be done progressively until the final closure of the mine.

d) Green Belt shall be properly designed in consultation with the forest department. Plantation shall be carried out as per the periodical plantation programme.

e) Fast-growing and evergreen trees, trees with broadleaf resistant to specific pollutant and those which would maintain the regional ecological balance, soil and hydrological conditions shall be favoured.

f) Green belt area within the along the haul roads, dumping sites and abandoned mine after mining shall be developed.

g) Besides this, only local labours shall be engaged for watch and ward and plantation activity with proper maintenance.

h) The plantation/regressing and its maintenance cost will be borne by the applicant. Also, a green belt will be developed in consultation with the local panchayat and forest department along approach roads in order to minimize pollution.

i) The estimated survival rate proposed to be achieved shall be 80%

(2) STRATEGY FOR PROTECTION OF POINT OF PUBLIC UTILITY ETC.:

There is no point of public utility or of interest which need to be protected while under taking mining operations.

(3) MAN POWER DEVELOPMENT:

Around 25 to 30 unskilled people shall be employed to carry on the mining and associated activities and preference shall be given to employ 100% local people.

(4) USE OF MINERAL:

The extracted stone shall be used for manufacturing of grit and manufactured Sand (M-Sand) and possibility shall also be explored to use the waste material in road construction works.

(5) ANY OTHER RELEVANT INFORMATION:

A lot of construction activity in private & Government sector is going on. Grit is the basic requirement for construction material and there is necessity of such activity to flourish so that the requirement of the material could be met locally.

In the applied mining lease area, following safety measures will be adopted after anticipating the hazard risk:

- ✓ All the provisions of Mines Act 1952, Metalliferous Mines Regulations, 1961, Mineral Conservation and Development Rules, and other laws applicable to mine will be strictly complied with.
- ✓ Personnel working in dusty areas will be provided with wear protective respiratory devices.
- ✓ Expenenced drivers with valid documents will be permitted for the transportation of minerals.
- ✓ Occupational health check-up for all the employees/workers should be undertaken periodically (on annual basis) to observe any changes due to exposure to dust, and corrective measures should be taken immediately, if needed.
- ✓ All emergency nos, like hospital, Police, fire service will be provided at the site. All mining personnel should be aware of the nearest health centres and hospitals. First aid kits will be provided at the site.
- ✓ All persons in supervisory capacity will be provided with proper communication facilities.
- ✓ Road signage shall be erected and maintained at appropriate stretches after assessment of the site.

****

CERTIFICATE

Certified that the provisions of the Himachal Pradesh Minor Minerals (Concession) and Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules, 2015 Metalliferous Mines Regulation 1961 and other guidelines issued from time to time in this regard have been complied for the preparation of Mining Plan of area applied for mining lease situated in Khasra Nos. 1165 (00-03-09 Hect.), 1166 (00-00-54 Hect.), 1169 (00-01-06 Hect.), 1173 (01-00-16 Hect.), 1174 (00-42-47 Hect.), 1196 (00-25-44 Hect.), 1197 (00-02-71 Hect.), 1198 (00-27-46 Hect.), 1200 (00-31-99 Hect.), 1206 (02-28-69 Hect.), 1206/1 (00-94-49 Hect.), 1226 (01-51-50 Hect.) & 1227 (00-11-73 Hect.) (Private Land) total measuring 07-21-35 Hectares (Hill Slope) in Mauza Kutharbeet, Mohal Jorrian Kutharbeet, Tehsil Haroli, District Una, Himachal Pradesh for extraction of Sand, Stone and Bajri for Manufacturing of Grit to be used in the already established Stone Crusher unit of the applicant in the name and style as "**M/s Lakhwinder Singh Stone Crusher and Screening Plant Unit-I**" in favour of Sh. Lakhwinder Singh Prop: - M/s Lakhwinder Singh Stone Crusher and Screening Plant Unit-I, Vill. & P.O. Polianbeet, Tehsil Haroli, District Una, Himachal Pradesh

While preparing the mining plan including progressive mine closure plan, all statutory rules, regulation, orders made by competent authorities of the State or Central Government or orders passed by Courts have been taken into consideration.

The information provided and the data furnished in this Mining Plan is correct to the best of my knowledge.

Date:
Place:

Arun Dhiman
S/o Sh Jagan Nath ,
Village & PO Dhaloon (Panchpuli),
Tehsil Nagrota Bagwan, District Kangra
Himachal Pradesh -176056
RQP No. H.P./ RQP/25/2/2019
Valid Upto 24-09-2024
Mobile No. 98165 79485
Email Id arundhiman77@yahoo.com

DECLARATION

This is to declare that the Mining Plan includes Progressive Mine Closure Plan of area applied for mining lease situated in Khasra Nos. 1165 (00-03-09 Hect.), 1166 (00-00-54 Hect.), 1169 (00-01-06 Hect.), 1173 (01-00-16 Hect.), 1174 (00-42-47 Hect.), 1196 (00-25-44 Hect.), 1197 (00-02-71 Hect.), 1198 (00-27-46 Hect.), 1200 (00-31-99 Hect.), 1206 (02-28-69 Hect.), 1206/1 (00-94-49 Hect.), 1226 (01-51-50 Hect.) & 1227 (00-11-73 Hect.) (Private Land) total measuring 07-21-35 Hectares (Hill Slope) in Mauza Kutharbeet, Mohal Jorian Kutharbeet, Tehsil Haroli, District Una, Himachal Pradesh for extraction of Sand, Stone and Bajri for Manufacturing of Grit to be used in the already established Stone Crusher unit of the applicant in the name and style as **"M/s Lakhwinder Singh Stone Crusher and Screening Plant Unit-I"** has been prepared with my consent and approval and that we/I shall abide by all commitment thereunder.

"The Mining Plan and 'Progressive Mine Closure Plan' complies all statutory rules, regulations, orders made by competent authorities of State or Central Government or orders passed by courts have been taken into consideration and wherever specific permission is required, shall be obtained.

We undertake to implement all the measures proposed in this Mining Plan and Progressive Mine Closure Plan' in a time bound manner.

We have deposited a sum of Rs. ..... with the competent authority of the State Government in form of Fixed Deposit Receipt as financial assurance of the same. In case of default on my/our part, the approval of Mining Plan may be withdrawn and the aforesaid sum assured may be forfeited.

Date: -
Place:-

Applicant

Lakhwinder Singh Prop: - M/s Lakhwinder Singh Stone Crusher and Screening Plant Unit-I,

Address

Vill. & P.O. Pollanbeet, Tehsil Haroli, District Una, Himachal Pradesh

PHOTOGRAPHS SHOWING VIEW APPLIED LEASE AREA AND MINERALS POTENTIAL

PHOTOGRAPHS SHOWING VIEW APPLIED LEASE AREA AND MINERALS POTENTIAL

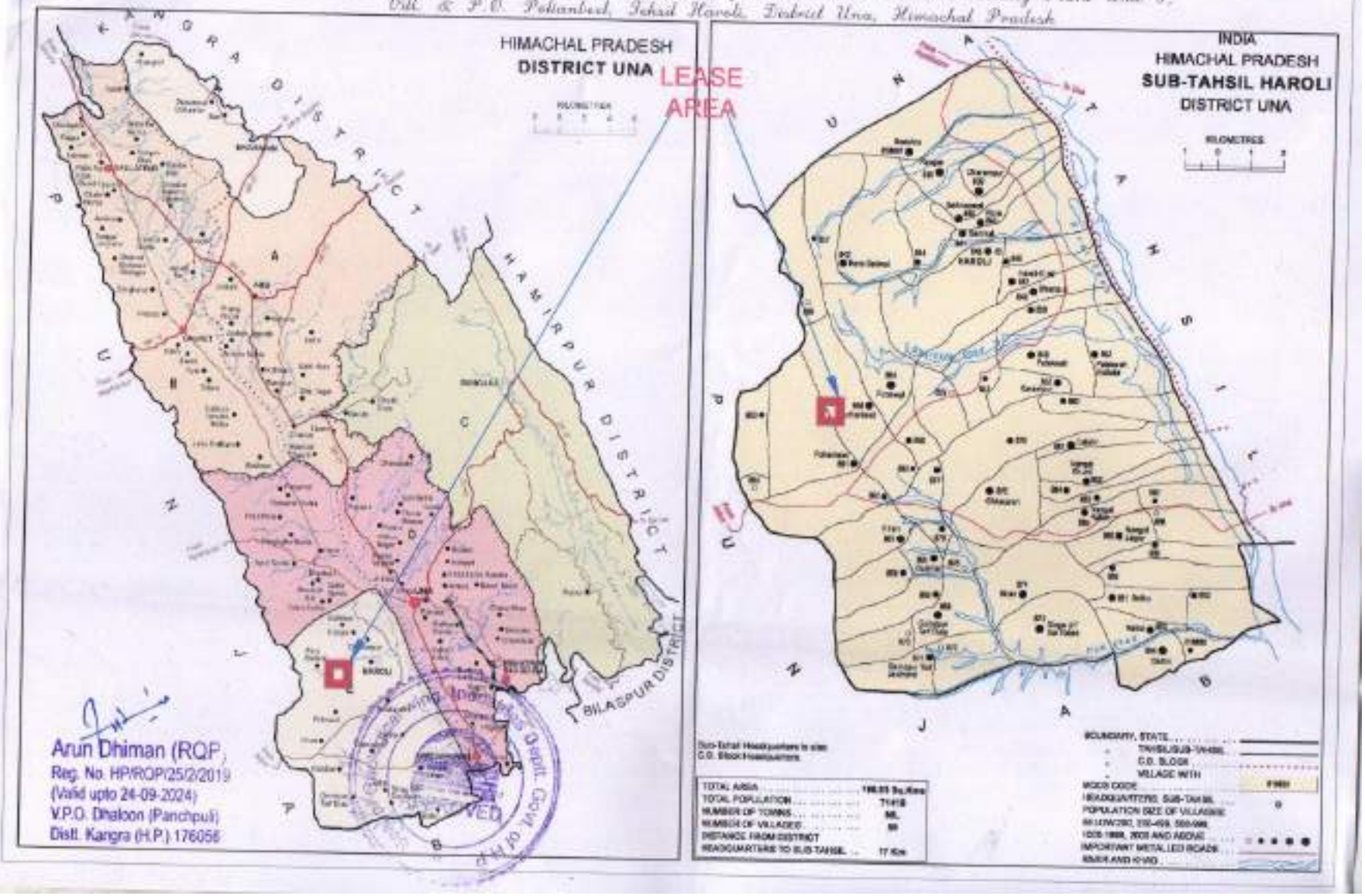
PHOTOGRAPHS SHOWING VIEW APPLIED LEASE AREA AND MINERALS POTENTIAL

Geological wing, Industries Deptt. Govt. of H.P.
APPROVED

LOCATION OF APPLIED MINING SITE

PLATE-I

Lakhwinder Singh, Prop:- M/s Lakhwinder Singh Stone Crusher and Screening Plant Unit-I,
Vill. & P.O. Pollambed, Tehsil Haroli, District Una, Himachal Pradesh



Arun Dhiman (RQP)
Reg. No. HP/ROP/25/2/2019
(Valid upto 24-09-2024)
V.P.O. Dhaloon (Panchpuli)
Distt. Kangra (H.P.) 176056

PLATE-2

Land Use Land Cover Map Based on Toposheet (H43E3)

(Source SoI)

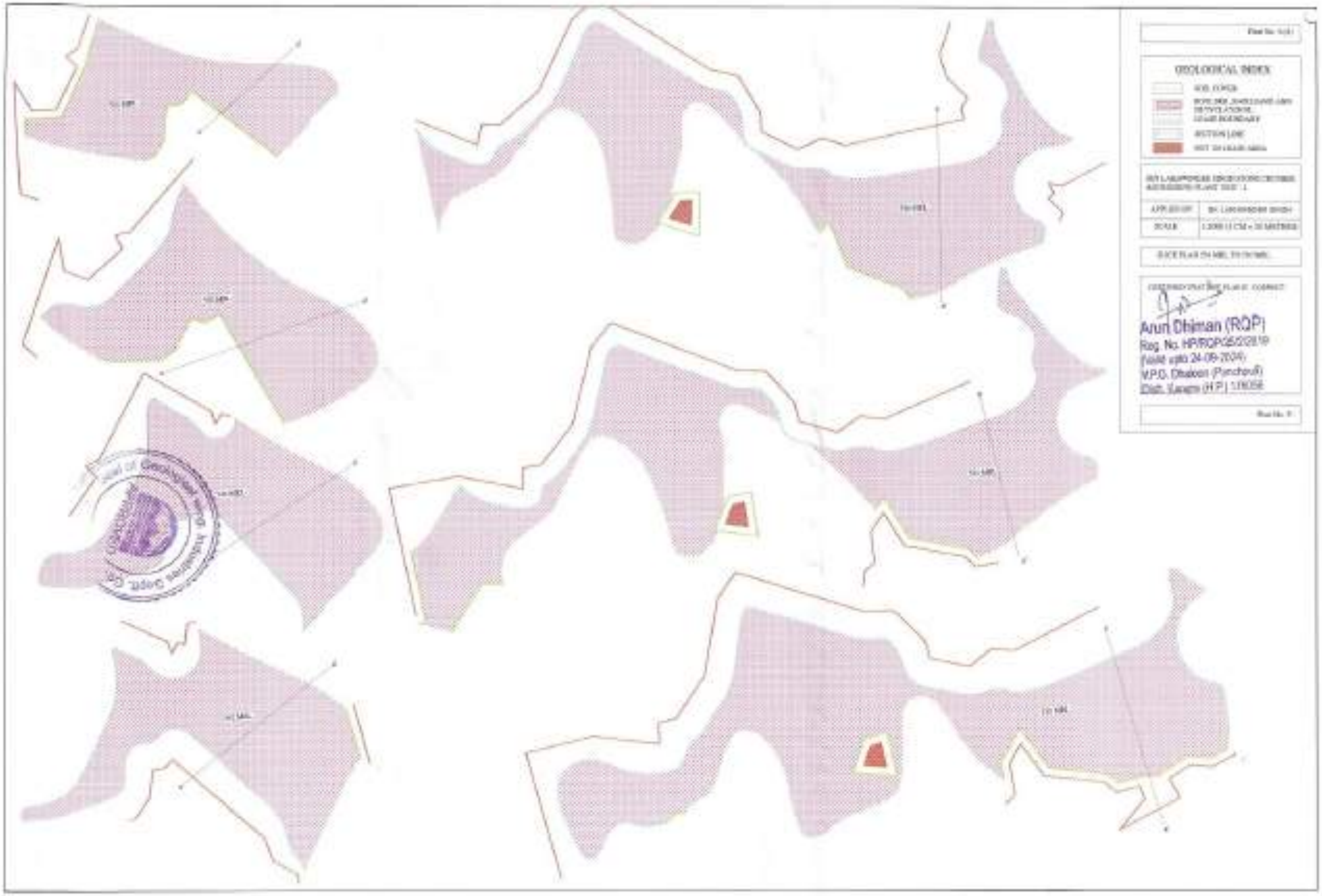
Applicant:

Lakhwinder Singh

Prop:- M/s Lakhwinder Singh Stone Crusher and Screening Plant Unit-I, Vill. & P.O. Polianbeet, Tehsil Haroli, District Una, Himachal Pradesh

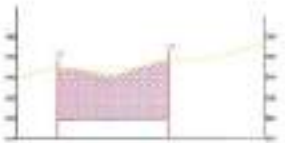
Prepared and Certified By:

Arun Dhiman (ROP)
Reg. No. HP/ROP/25/2/2019
(Valid upto 24-09-2024)
V.P.O. Dhaloon (Panchpuli)
Distt. Kangra (H.P.) 176055

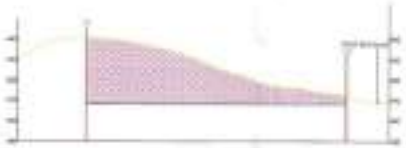

GEOLOGICAL INDEX
SECTION LINE
SCALE
Arun Dhiman (RQP)

X-SECTION ALONG A-A'

X-SECTION ALONG B-B'



X-SECTION ALONG C-C'



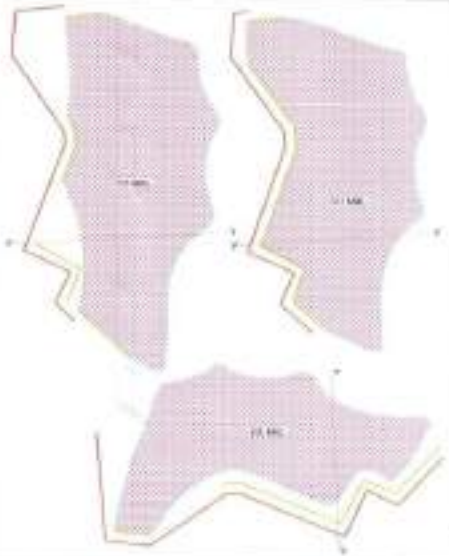
X-SECTION ALONG D-D'

GEOLOGICAL INDEX

Arun Dhiman (RQP)
Reg. No. HPRQP/05/2/2019
(Valid upto 24-09-2024)
V.P.O. Dhalwan (Panchayat)
Distt. Kangra (H.P.) 176057

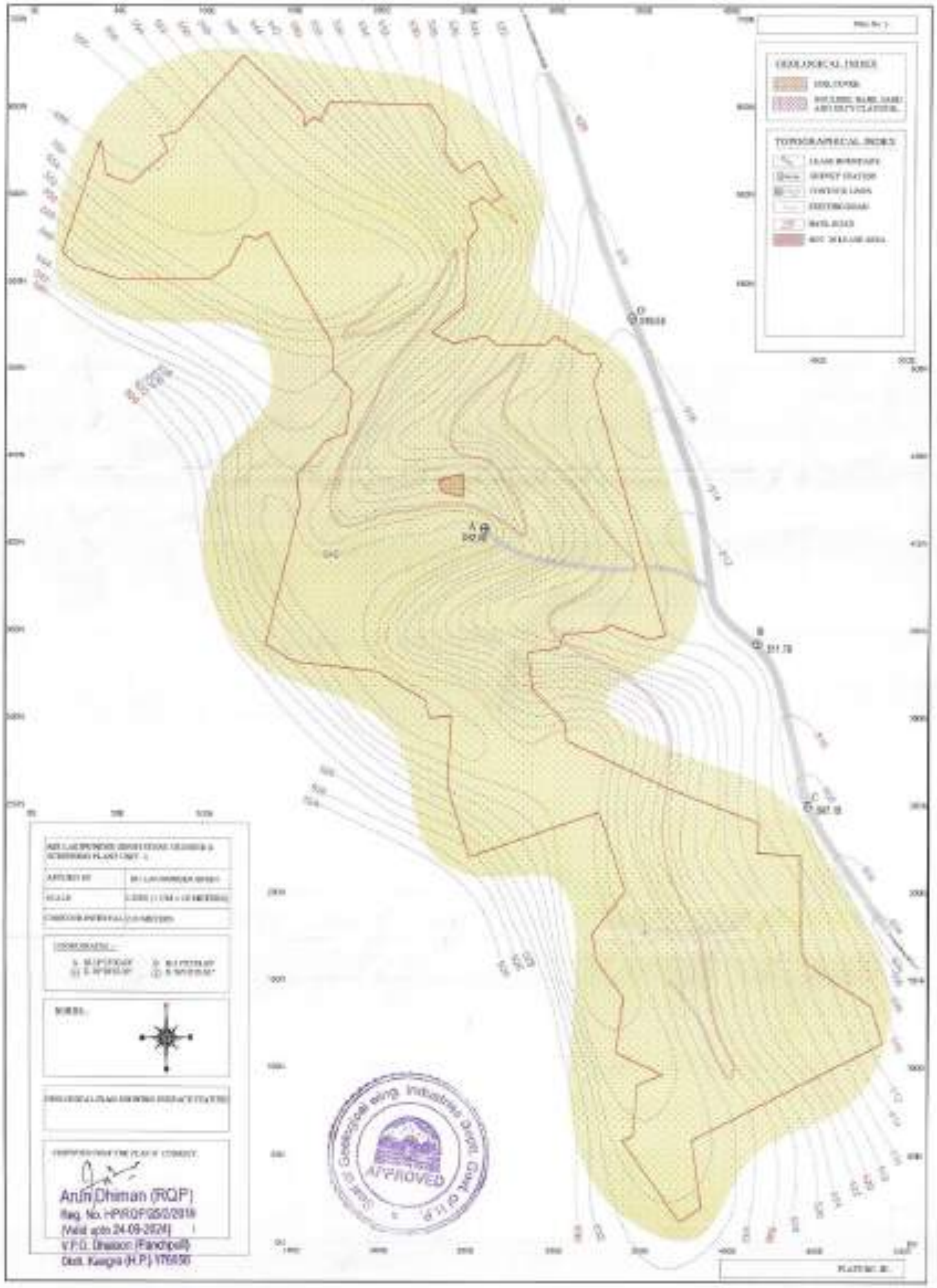
GEOLOGICAL INDEX

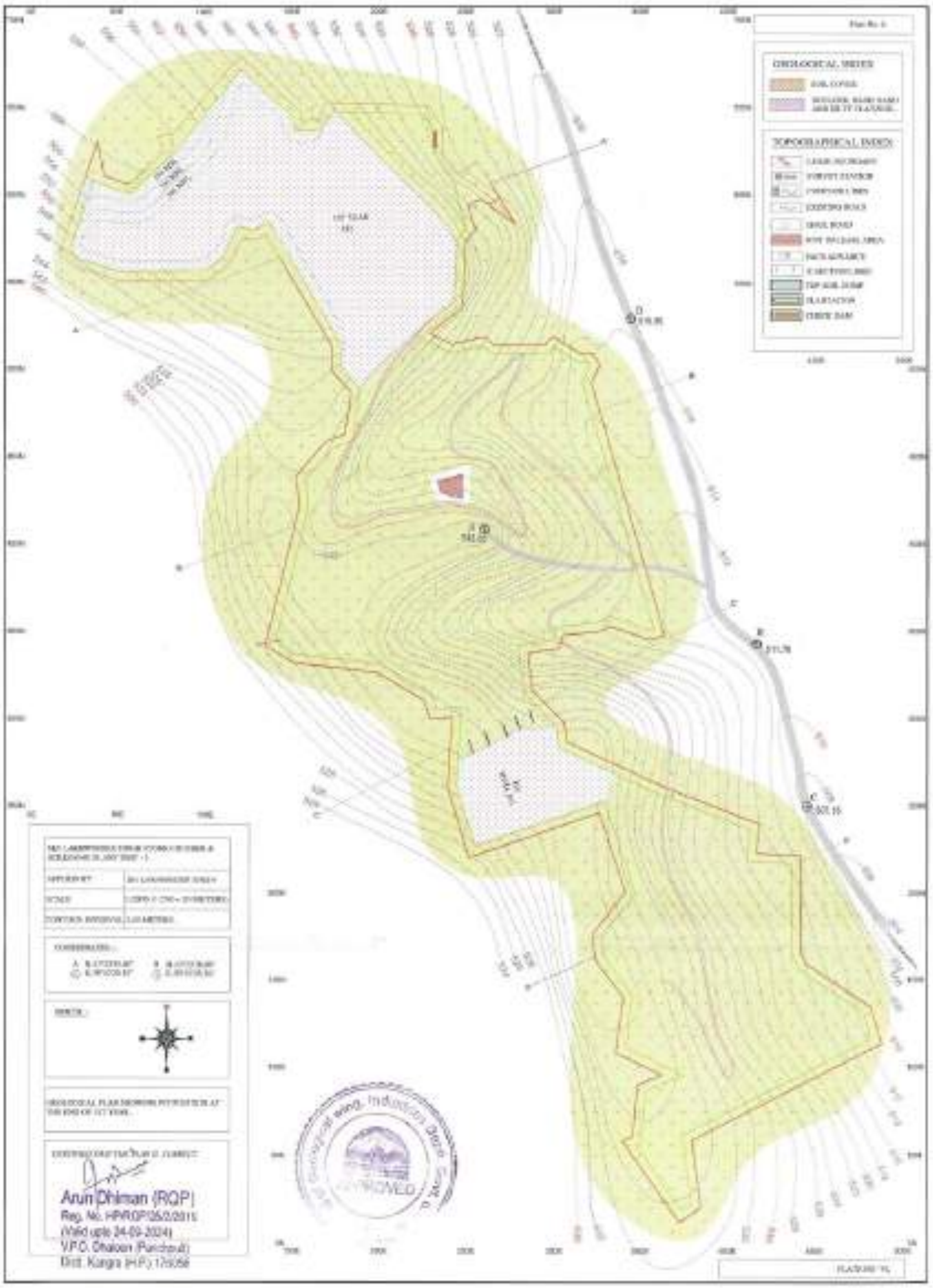
Arun Dhiman (RQP)
Reg. No. HPRQP/05/2/2019
(Valid upto 24-09-2024)
V.P.O. Dhalwan (Panchayat)
Distt. Kangra (H.P.) 176057



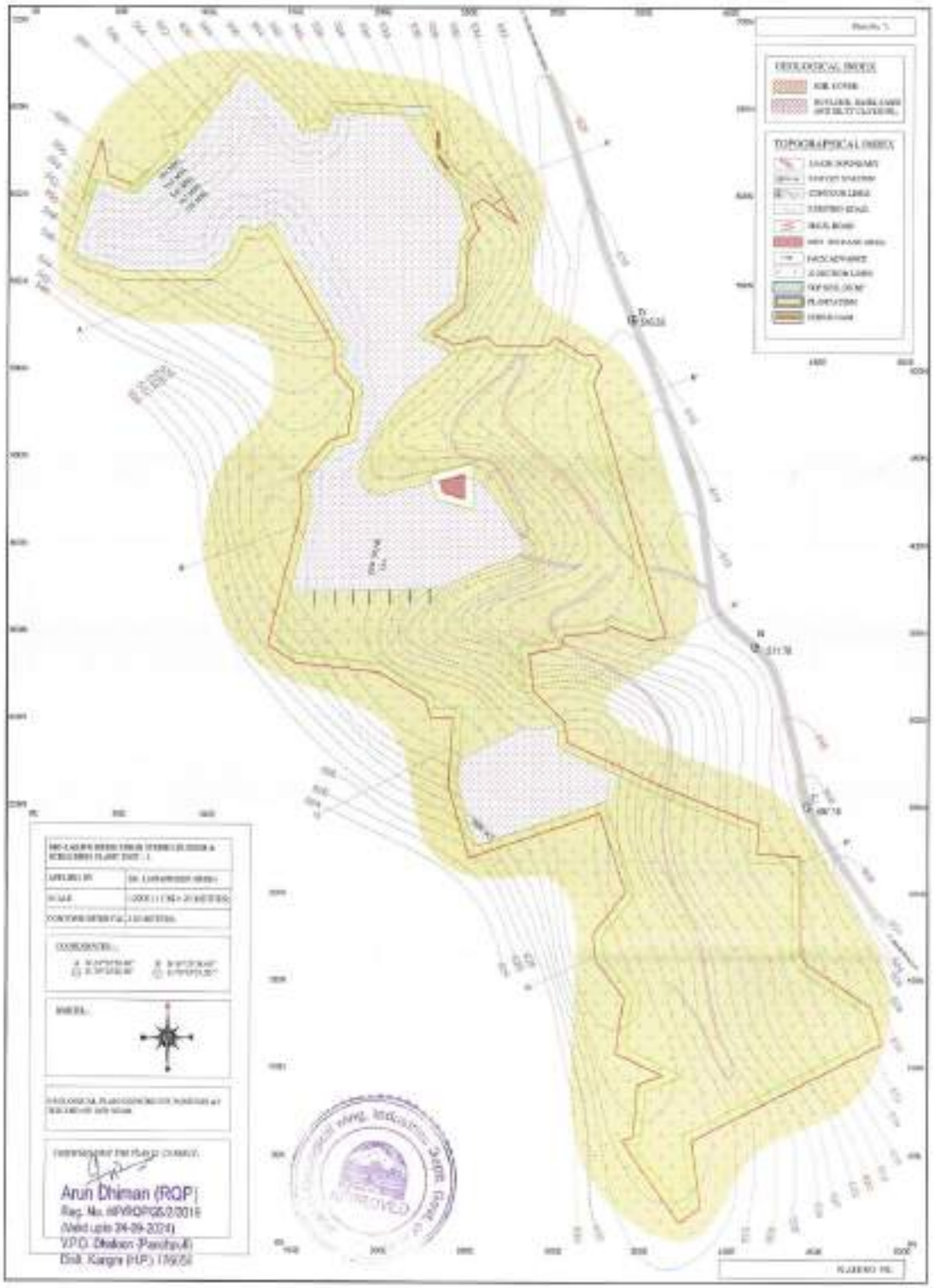
GEOLOGICAL INDEX

Arun Dhiman (RQP)
Reg. No. HPRQP/05/2/2019
(Valid upto 24-09-2024)
V.P.O. Dhalwan (Panchayat)
Distt. Kangra (H.P.) 176057


TOPOGRAPHICAL INDEX
Geological wing, Industries
APPROVED
Arun Dhiman (RQP)
Reg. No. HP/RQP/25/2/2019
(Valid upto 24-09-2024)
V.P.O. Dhaloon (Panchpeli)
Distt. Kangra (H.P.) 176050


TOPOGRAPHICAL INDEX
EXISTING ROAD
TOP SOIL DUMP
PLANTATION
CHECK DAM
SCALE
CONTOUR INTERVAL
APPROVED
Arun Dhiman (RQP)
Reg. No. HP/RQP/26/2/2015
(Valid upto 24-09-2024)
V.P.O. Dhaloon (Punchrot)
Distt. Kangra (H.P.) 176058


GEOLOGICAL INDEX
Arun Dhiman (RGP)
Reg. No. HP/RGP/25/2020/9
(Valid upto 24-09-2024)
V.P.O. Dhalkon (Panchpuli)
Distt. Kangra (H.P.) 176056


GEOLOGICAL INDEX
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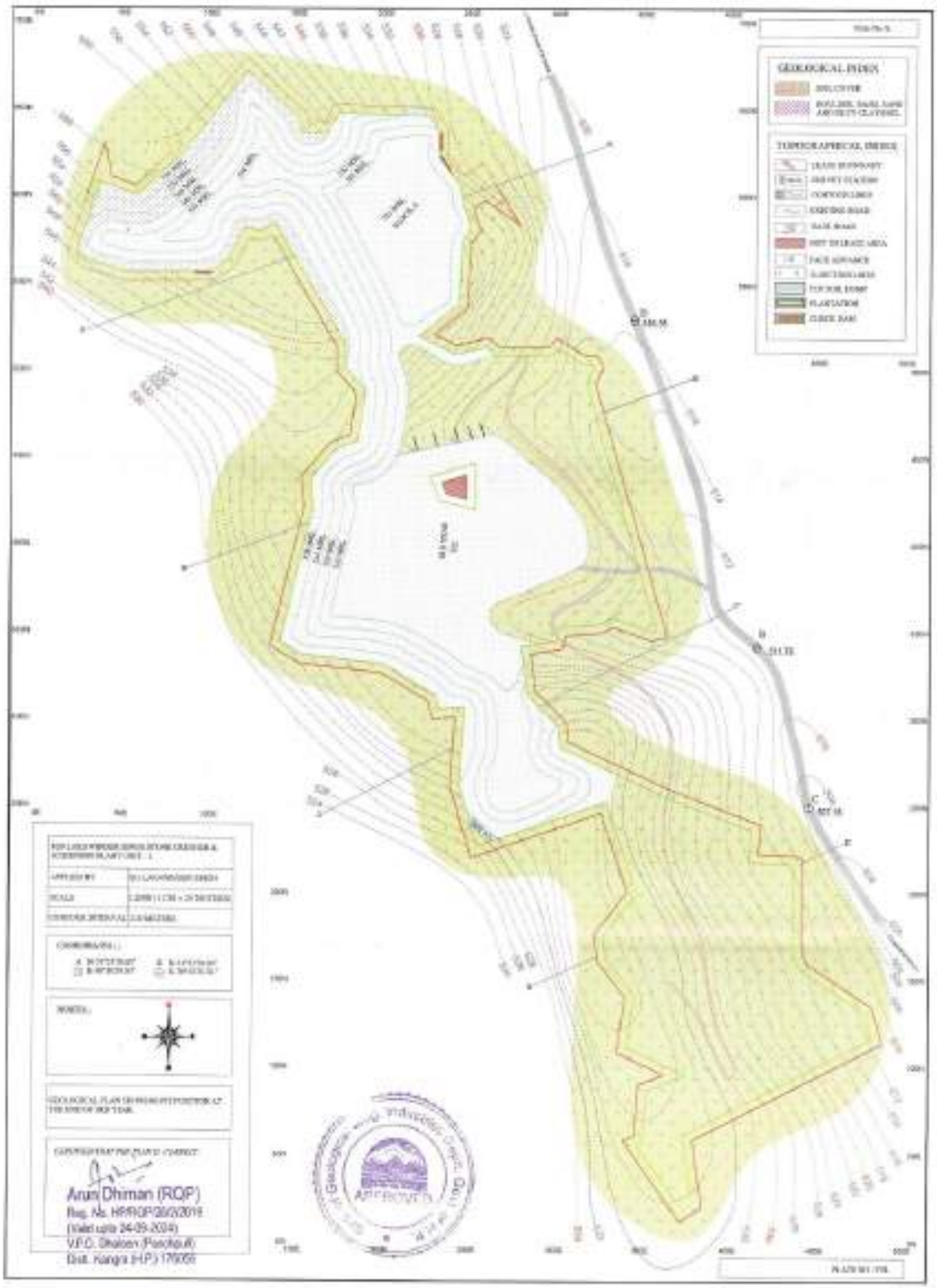
Arun Dhiman (RQP)
Reg. No. HPVRQP/05/2/2016
(Valid upto 24-09-2024)
V.P.O. Dhalkon (Panchyat)
Distt. Kangra (H.P.) 176058


GEOLOGICAL INDEX
TOPOGRAPHICAL INDEX
Arun Dhiman (RQP)
Reg. No. HP/RQP/20/2019
(Valid upto 24-09-2024)
V.P.O. Dhalosni (Panchyat)
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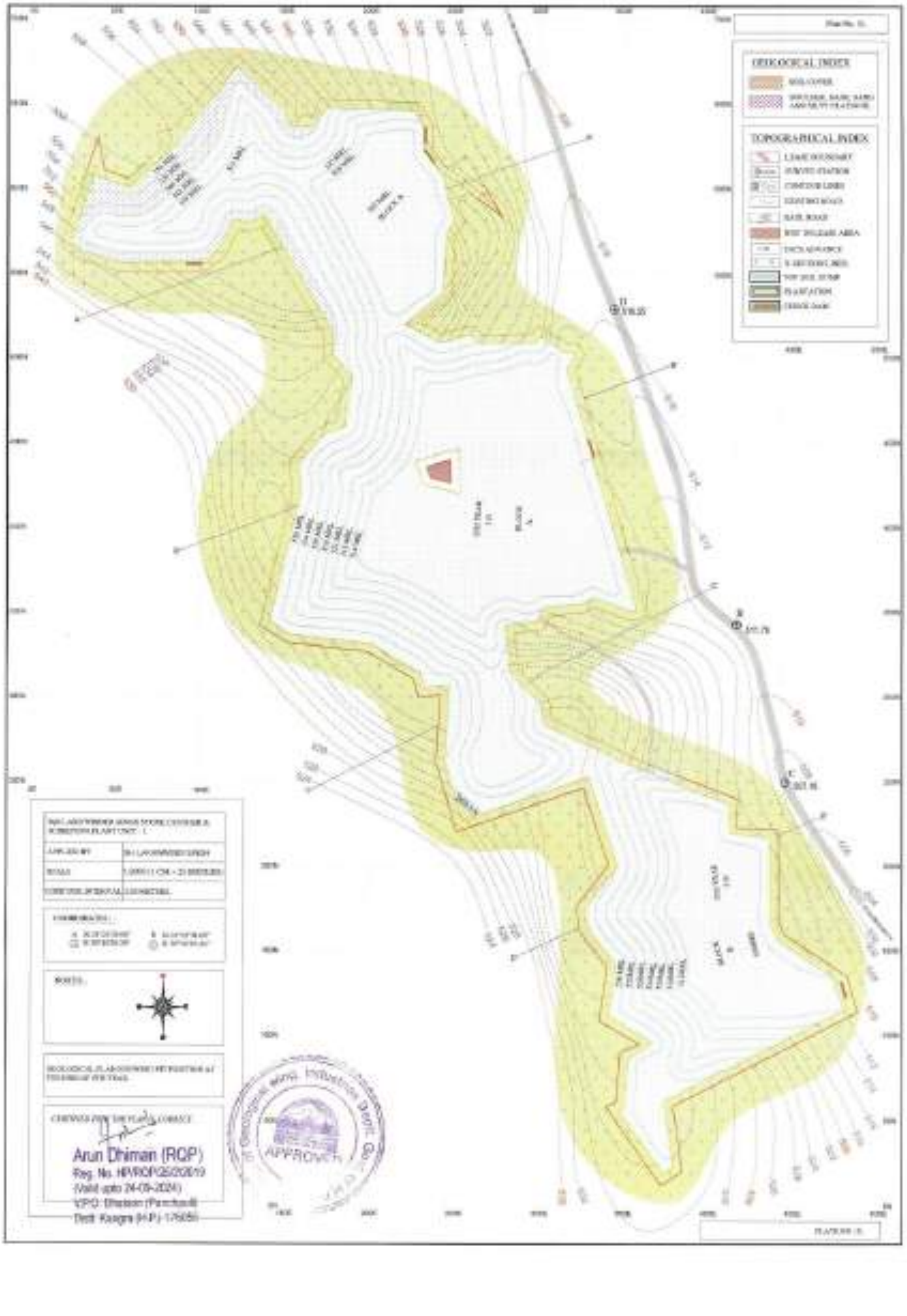
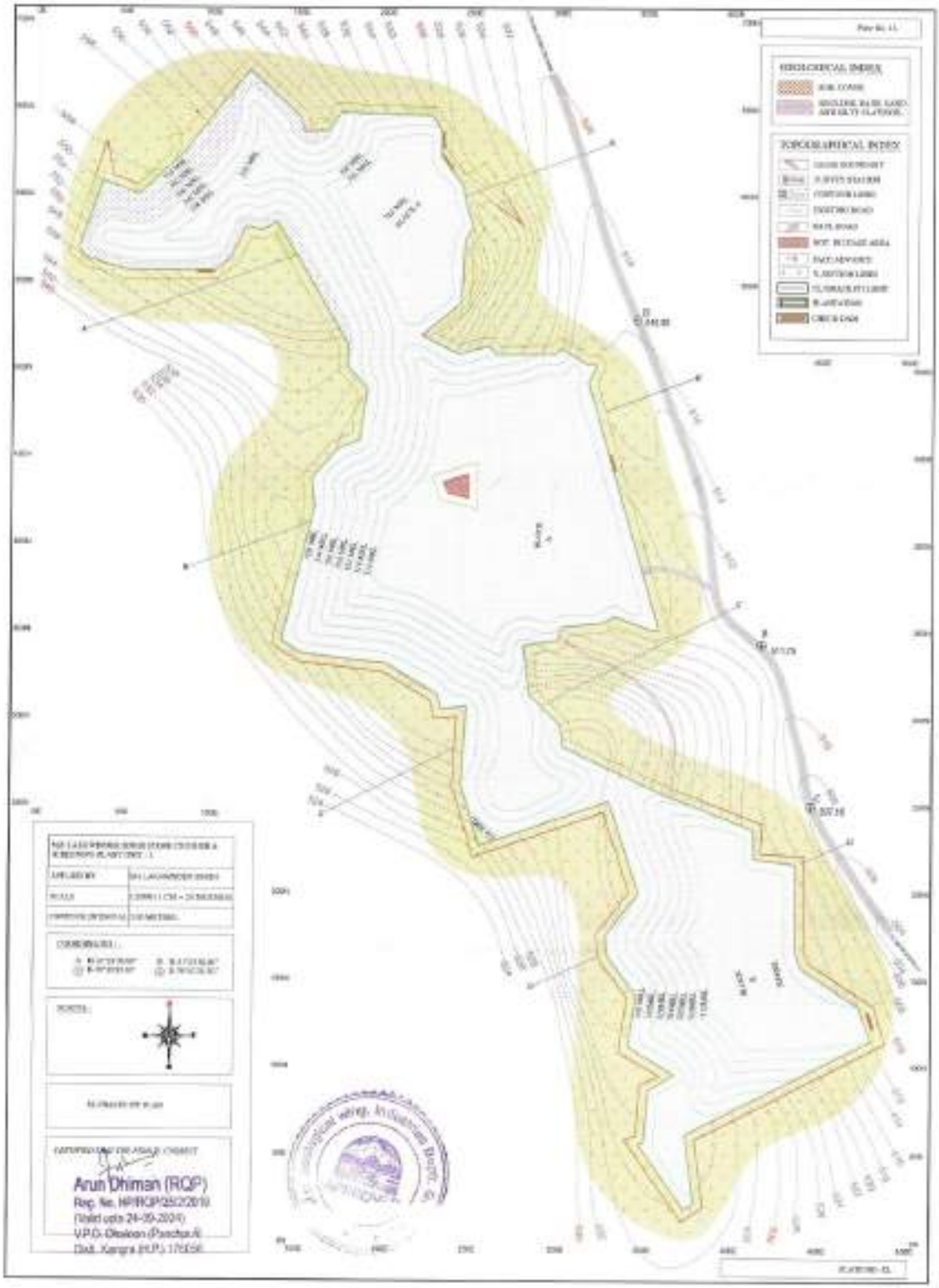
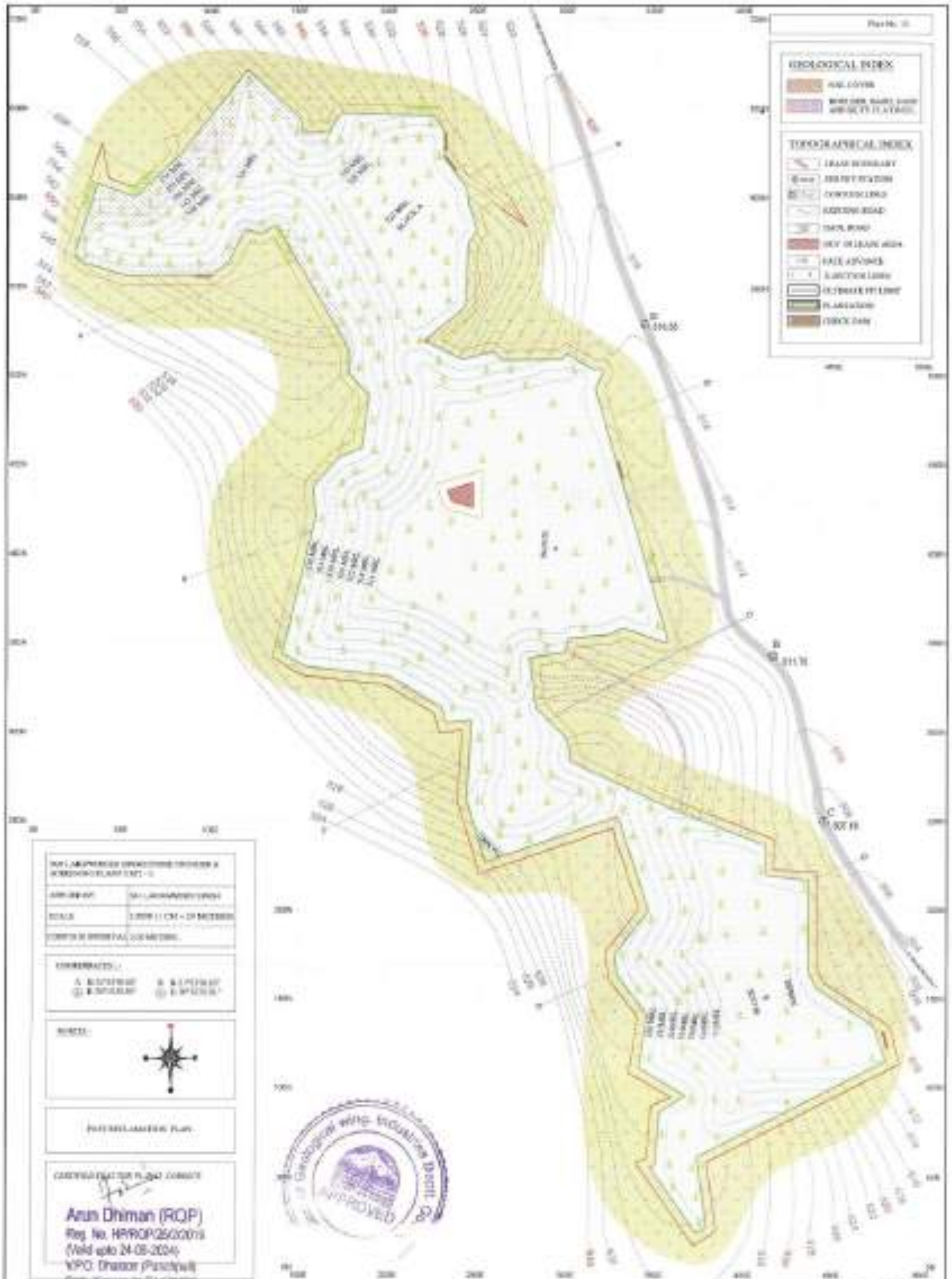
Anuh Dhiman (RQP)
Reg. No. HPRQP/260/2018
Valid upto 24-05-2024
V.P.O. Dhalian (Palampur)
Distt. Kangra (H.P.) 176062
APPROVED


GEOLOGICAL INDEX
TOPOGRAPHICAL INDEX
APPROVED
Arun Dhiman (RQP)
Reg. No. HP/RQP/25/2019
(Valid upto 24-09-2024)
VPO: Dhaloon (Panchrukhi)
Distt. Kangra (H.P.) 176056


Arun Dhiman (RQP)
Reg. No. HP/RQP/25/2019
(Valid upto 24-09-2024)
V.P.O. Dhalian (Panchpulli)
Distt. Kangra (H.P.) 176056


GEOLOGICAL INDEX
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ULTIMATE PIT LIMIT
PLANTATION
CHECK DAM
APPROVED
Arun Dhiman (RQP)
Reg. No. HP/RQP/26/2019
(Valid upto 24-09-2024)
V.P.O. Dhaloor (Panchrukhi)
Distt. Kangra (H.P.) 176208

ANNEXURE VII

HP FOREST DEPARTMENT
UNA FOREST DIVISION, UNA (HP)

To whom it may concern

As requested by M/S Lakhwinder Singh, Village & PO Polian Beet Tehsil Haroli, Distt. Una (HP) the following information is hereby authenticated in respect of Khasra No. 1165, 1166, 1169, 1173, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227 area measuring 07-21-35 hact. falling in Mohal Jodian Kuthar Beet, Tehsil Haroli, Distt. Una (HP) which is under private ownership:-

There is no wild life sanctuary/National park/Biosphere Reserve within 10 KM distance of the mining lease site.

List of flora and fauna, fast growing species, Aquatic Animal species present in the area is enclosed.

Divisional Forest Officer,
Una Forest Division, Una
Phone: 01975-223636
E-mail: forestuna1@gmail.com

Endst. No. 14494-95 dated Una, the 11/2/22

Copy for information and necessary action is forwarded to:-

1. M/S Lakhwinder Singh, Village & PO Polian Beet Tehsil Haroli, Distt. Una (HP) w.r.t his application dated 16.01.2022.
2. Range Forest Officer, Una w.r.t. his letter No. 807 dated 04.02.2022.

Divisional Forest Officer,
Una Forest Division, Una

Table: Flora of the Study area

Sl. No.	Species	Family	Habit
1	*Albizia lebbeck*	Fabaceae	Tree
2	*Bauhinia variegata*	Fabaceae	Tree
3	*Celtis australis*	Cannabaceae	Tree
4	*Dodonaea viscosa*	Sapindaceae	Shrub
5	*Ipomoea* [illegible]	Convolvulaceae	Shrub
6	*Morus alba*	Moraceae	Tree
7	*Saccharum munja*	Poaceae	Grass
8	[illegible]	Poaceae	Grass
9	[illegible]	Poaceae	Grass
10	[illegible]	Lamiaceae	Shrub
11	[illegible]	Rhamnaceae	Shrub
12	*Abutilon indicum*	Malvaceae	Herb
13	*Acacia catechu*	Fabaceae	Tree
14	*Acacia nilotica*	Fabaceae	Tree
15	*Achyranthes aspera*	Amaranthaceae	Herb
16	*Adhatoda vasica*	Acanthaceae	Shrub
17	*Ageratum conyzoides*	Asteraceae	Herb
18	*Albizia procera*	Mimosaceae	Tree
19	*Barleria cristata*	Acanthaceae	Herb
20	*Bauhinia variegata*	Fabaceae	Tree
21	*Boerhavia diffusa*	Nyctaginaceae	Herb
22	*Bombax* [illegible]	Bombacaceae	Tree
23	*Carissa* [illegible]	Apocynaceae	Shrub
24	*Cassia fistula*	Fabaceae	Tree
25	[illegible]	Ulmaceae	Tree
26	[illegible]	Menispermaceae	Climber
27	[illegible]	Boraginaceae	Tree
28	*Cryptolepis buchanani*	Asclepiadaceae	Climber
29	*Dalbergia sissoo*	Fabaceae	Tree
30	*Datura stramonium*	Solanaceae	Shrub
31	*Dicliptera bupleuroides*	Acanthaceae	Herb
32	*Dodonaea viscosa*	Sapindaceae	Shrub
33	*Eupatorium species*	Asteraceae	Herb
34	*Euphorbia* [illegible]	Euphorbiaceae	Shrub
35	[illegible]	[illegible]	Shrub

Range Forest Officer
[illegible] Range

DN
[illegible] Block
.................Block
Date : 02/02/2022

Sl. No.	Species	Family	Habit
41	*Lantana camara*	Verbenaceae	Shrub
44	*Malva parviflora*	Malvaceae	Shrub
46	*Murrayakoenigii*	Anacardiaceae	Shrub
49	*Sidaacuta*	Malvaceae	Herb
50	*Solanum nigrum*	Solanaceae	Herb
53	*Tinospora cordifolia*	Menispermaceae	Climber
54	*Urenalobata*	Malvaceae	Shrub
55	*Xanthium strumarium*	Asteraceae	Shrub
58	*Ziziphus mauritiana*	Rhamnaceae	Shrub

Table: Fauna of the Study area

Sl.No.	Common Name	Scientific name	Wildlife Schedule	IUCN Red List Status
		Mammals:		
1	Field mouse	*Apodemussylvaticus*	-	LC
3	Golden Jackal	*Canis aureus*	II	LC
4	Wild dog	*Cuonalpinus*	II	DD
5	Indian Palm Squirrel	*Funambulus palmarum*	IV	LC
6	Indian Grey Mongoose	*Herpestes edwardsii*	II	LC
7	Indian hare	*Lepusnigricollis*	-	LC
8	Rhesus macaque	*Macacamulatta*		LC
9	Fruit bat	*Pteropusgiganteus*	-	LC
10	Rat	*Rattusrattus*	V	DD
11	Wild pig	*Susscrofa*	III	LC
		Domestic Animals:		
1	Cow	*Bosindicus*		NA
2	Buffalo	*Bubalusbubalis*		DD
3	Goat	*Capraaegagrushircus*		DD

Alok Chand B.O.
........................Block
Date: ....

Range Officer
[illegible]

Sl.No	Common Name	Scientific name	Wildlife Schedule	IUCN Red List Status
		Avian Fauna (Birds):		
1	Jungle Myna	*Acridotheres fuscus*	IV	LC
2	Common Myna	*Acridotheres tristis*	IV	LC
3	Pintail (Duck)	*Anasacuta*	IV	LC
4	Common Teal	*Anascrecca*	IV	LC
5	Mallard (wild duck)	*Anas platyrhynchos*	IV	LC
6	Gadwall	*Anasstrepera*	IV	LC
7	Pond Heron	*Ardeolagrayii*	IV	DD
8	Spotted Owlet	*Athenebrama*	IV	LC
9	Common pochard	*Aythyaferina*	IV	LC
10	Cattle Egret	*Bubulcus ibis*	IV	LC
11	Red-rumped Swallow	*Cecropis daurica*	-	DD
12	Pied kingfisher	*Cerylerudis*	IV	DD
13	Blue Rock Pigeon	*Columba livia*	-	LC
14	Oriental Magpie Robin	*Copsychussaularis*	IV	LC
15	Indian Crow	*Corvus [illegible]*	[illegible]	LC
16	House Crow	*Corvus splendens*	V	LC
17	Common Cuckoo	*Cuculuscanorus*	IV	LC
18	Fork-tailed Drongo	*Dicrurusadsimilis*	IV	LC
19	Asian Koel	*Eudynamysscolopacea*	IV	NA
20	Common hill Myna	*Gracula religiosa*	IV	LC
21	White-breasted King fisher	*Halcyon smyrnensis*	IV	LC

O/c [illegible] D.O.
.................Block
Date:
Range Officer
[illegible]

List of fast growing species

1. Drek (*Melia azedarach*)

2. Popular (*Populus spp.*)

3. Sateda (*Eucalyptus spp.*)

4. Siris (*Albizia lebbeck*)

5. Sehtoot (*Morus alba*)

Block:

Date :

AQUATIC ANIMALS

Amphibians

S.No.	Common Name	Scientific name	IWPA
1	Common Indian toad	*Duttaphrynus melanostictus*	IV
2	Indian skipper frog	*Euphlyctis cyanophlyctis*	IV
3	Indian bull frog	*Hoplobatrachus tigerinus*	IV

Fishes

S.No.	Common Name	Scientific name	IWPA
1	Dumra or Dhambra	*Labeo rohita*	-
2	Theila	*Catla catla*	-
3	Mirror Carp	*Cyprinus carpio*	-
4	Silver Carp	*Hypophthalmichthys molitrix*	

Block

Date :

ANNEXURE VIII

भारतीय गैर न्यायिक

बीस रुपये

रु.20

Rs.20

TWENTY RUPEES

INDIA

INDIA NON JUDICIAL

NOTARY GOVT. OF H.P. (INDIA)

Exp. Dt. 25/11/2026

हिमाचल प्रदेश HIMACHAL PRADESH

04AA 044187

AFFIDAVIT

I, Lakhwinder Singh, S/o Sh Jagmail Singh, R/o of House no 1238, Sector 90-91, SAS Nagar Mohali PB is Sole Proprietor of M/s Lakhwinder Singh Stone Crusher & Screening Plant Unit-01, VPO Polian Beet, Tehsil Haroli, Distt Una (H.P.) do hereby solemnly affirm and declare as under:

1. That I am permanent resident of above-mentioned address.
2. That I hereby undertake the responsibility to provide 2 Solar Lights by marking on Solar Lights "Donate under CER Activity and to donate one plastic Shredder Machine and One Plastic bailing through department of Environment Science & Technology Shimla, as per CER activity and also provide training for shred and plastic waste to Self Help Group/ Local Mahila Mandal at Mauja Kungrat Mahal Thara Heeran, Tehsil Haroli, Distt Una (H.P.)

Deponent

Verification

I, the above-named deponent further declare that the contents of my above affidavit are true and correct to the best of my knowledge and belief and nothing has been concealed therein. Verified on this ____

Certified that this Affidavit presented for attestation by Sh. Lakhwinder Singh S/o Jagmail Singh Resident SAS Nagar and who is identified by Sh. ____ or who is personally known to me and is entered at serial ____ Time at ____ Place ____ Dated 13/06/2025

ATTESTED

NOTARY

Deponent

ANNEXURE IX

No. IPH-SE-P&I-II-EEGWA/2017-18: 2260-61
Government of Himachal Pradesh
I &PH Department
Dated :Shimla the 15-11-17

To,

Sr. Hydrogeologist.
Ground Water Organization
I&PH Department, Una (H.P.).

Subject:- **Application for Certificate of Registration of bore well and use of Ground Water.**

Enclosed please find herewith 1 No. application on prescribed proforma a/w all other supporting documents for verification of facts at site and necessary recommendations for Certificate of Registration in respect of the applicant.

M/S Lakhwinder Singh (Stone Crusher), VPO. Kungrat, Tehsil Haroli, Distt. Una (HP).

Application has been submitted by the applicant on Form-4A for Certificate of Registration for 1 no. bore well already existed for extraction of water for **Industrial purpose.** The bore well situated in **Khatta No. 162min, Khatauni No. 253min, Khasra No. 2180,** in/mohalla **VPO Kungrat, Tehsil Haroli, Distt. Una (HP).**

It is therefore requested that the facts in respect of above application may be verified at site along with water requirement per day. Thereafter, the detailed comments with regard to the section – 8 of the H.P. Ground Water Act with special reference to the points mentioned in T/o letter no. IPH-P&I-II-E.E. (M)-GWA/2009/10- 361 dated 1st May 2010 (copy already stands supplied to you) in respect of grant of permit may also be sent to this unit on prescribed proforma a/w all other supporting documents at the earliest so that further action could be taken by the Authority.

DA: 1 No. application
on prescribed proforma a/w
all other supporting documents.

Member-Secretary, HPGWA-cum-
Superintending Engineer,
P&I-II Unit, I&PH Department,
Jal Bhawan, Kasumpti, Shimla-9.

Copy to M/S Lakhwinder Singh (Stone Crusher), VPO. Kungrat, Tehsil Haroli, Distt. Una (HP) for information please.

Member-Secretary, HPGWA-cum-
Superintending Engineer,
P&I-II Unit, I&PH Department,
Jal Bhawan, Kasumpti, Shimla-9.

"SAVE WATER SAVE LIFE"

o/c o/c

फगवाड़ा रोड, माहिलपुर (होशियारपुर) पंजाब (3431)
Phagwara Road, MAHILPUR (Hoshiarpur) Pb. - 146105

VALID FOR THREE MONTHS ONLY

3 1 0 5 2 0 1 7
D D M M Y Y Y Y

THE MEMBER SECRETARY HIMACHAL PRADESH GROUND WATER AUTHORITY

मांगे जाने पर ON DEMAND PAY

या उनके आदेश पर OR ORDER

** Ten Thousand only**

रुपये RUPEES

मूल्य के बदले अदा करें FOR VALUE RECEIVED ₹ **10,000.00**

UMB 029335

0001/2017

पंजाब नैशनल बैंक punjab national bank

RCC SHIMLA FINACLE

Draft is signed singly as it is for amount upto Rs. 50,000/-
(NOT OVER Rs.10000/-)

AUTHORISED SIGNATORY WITH GBPA No.

AUTHORISED SIGNATORY WITH GBPA No.

⑈029335⑈ 000024000⑆ 16

SP UNA HO (174303)
EE746294092IN
Counter No:2,OP-Code:012
To:THE MEMBER SEC,HP
shdale hp, PIN:171009
From:M/S L SINGH , UNA HP174303
Wt:50grams,
Amt:41.00 ,20/05/2017 ,12:14
Taxes:Rs.6.00<(Track on www.indiapost.gov.in)>

भारतीय डाक India Post

ANNEXURE X

NOIDA TESTING LABORATORIES

(A Government of India Approved Testing Laboratory)

(An ISO : 9001 : 2015, ISO 45001 : 2018 (OH&S) Certified & NABL Accredited Laboratory)

MoEF & CC (Ministry of Environment, Forest & Climate Change), UPPCB Recognized Laboratory

Dedicating for an Assured Future

☎ +91-9313611642, 8510081921, 7503031145, 8527870572, 7503031146, 9999794369

TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Water	W-261222-011	06/01/2023

Issued To: M/s Lakhwinder Singh Stone Crusher and Screening (Unit - 1)

Project Name: Sh. Lakhwinder Singh S/o Sh. Jagmail Singh

Location: Khasra Nos. 1165, 1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227 measuring 7-21-35 ha. (Private Land/Hill Slope) falling in Mauza Kutharbeet, Mohal Jorrian Kutharbeet, Tehsil Haroli, Distt. Una, H.P.

SAMPLING & ANALYSIS DATA

Sample Drawn On	:	24/12/2022
Sample Description	:	**Surface Water**
Sample Collected By	:	NTL Representative
Sample Quantity	:	2.0 Litre
Analysis Duration	:	26/12/2022 to 31/12/2022

S.No	Parameters	Unit	Panjoianwala Khad Center	Panjoianwala Khad Upstream	Panjoianwala Khad Downstream	Jainini Khad Downstream	Tibbi	Jaijon
1	pH value	-	7.56	7.12	7.56	7.80	7.41	7.35
2	Turbidity	NTU	10	3.8	4.5	5.2	4.0	3.2
3	Conductivity	uS/cm	389	320	360	380	412	354
4	Total Dissolved Solids	mg/l	2962	205	230	245	264	228
5	Total Suspended solids	mg/l	8.5	7.2	8.1	8.4	10.0	12.4
6	Total Hardness (as $CaCO_3$)	mg/l	110	98	112	123	108	125
7	Chlorides (as Cl)	mg/l	21	16	20	18	21	19
8	Total Alkalinity as $CaCO_3$	mg/l	114	105	120	126	115	128
9	Sulphate (as SO_4)	mg/l	32	28	35	34	26	30
10	Nitrate(as NO_3)	mg/l	3.2	2.8	3.4	3.8	4.1	3.6
11	Fluoride (as F)	mg/l	0.56	0.41	0.48	0.50	0.34	0.42
12	Iron (as Fe)	mg/l	0.24	0.16	0.20	0.24	0.12	0.10
13	Zinc (as Zn)	mg/l	0.35	0.21	0.26	0.32	0.19	0.14
14	Calcium (as Ca)	mg/l	78.5	76.8	89.2	82.5	110	102
15	Magnesium (as Mg^{2+})	mg/l	20.8	22.7	26.80	20.1	40.4	31.4
16	Cadmium (as Cd)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
17	Copper (as Cu)	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Nickel (as Ni)	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
19	Lead (as Pb)	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
20	Mercury (as Hg)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

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MoEF & CC (Ministry of Environment, Forest & Climate Change), UPPCB Recognized Laboratory

☎ +91-9313611642, 8510081921, 7503031145, 8527870572, 7503031146, 9999794369

TEST CERTIFICATE

21	Total arsenic (as As)	mg/l	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
22	Phenolic Compounds (as C_6H_5OH)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Manganese as Mn	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Cyanide as CN	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
25	Total Chromium (as Cr)	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
26	Aluminum as Al	mg/l	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
27	Oil & Grease	mg/l	<2	<2	<2	<2	<2	<2
28	Chemical Oxygen Demand	mg/l	16	14	18	20	21	28
29	Bio- Chemical Oxygen Demand as BOD (for 3 Days 27 °C)	mg/l	2.5	2.2	2.8	3.2	4.0	4.5
30	Dissolved Oxygen	mg/l	6.2	6.5	6.0	5.8	6.6	6.4
31	Total Coliform	MPN /100ml	3.5×10^4	2.8x 103	4.6×10^3	4.8 x 103	3.2×10^3	2.8×10^3

Notes:

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.

Ajali

CHECKED BY

AUTHORIZED SIGNATORY

NOIDA TESTING LABORATORIES

(A Government of India Approved Testing Laboratory)

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Water	W-261222-012	06/01/2023

Issued To: M/s Lakhwinder Singh Stone Crusher and Screening (Unit - 1)

Project Name: Sh. Lakhwinder Singh S/o Sh. Jagmail Singh

Location: Khasra Nos. 1165, 1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227 measuring 7-21-35 ha. (Private Land/Hill Slope) falling in Mauza Kutharbeet, Mohal Jorrian Kutharbeet, Tehsil Haroli, Distt. Una, H.P.

SAMPLING & ANALYSIS DATA

Sample Received on : 24/12/2022

Sample Drawn By : **NTL Representative**

Sample Quantity : 2.0 lit. + 500 ml.

Analysis Duration : 26/12/2022 to 31/12/2022

Sample Description : Ground Water

S.No.	Parameter	Test Method	Unit	Desirable Limit	Permissible Limit	Pubowal Village	Baliwal Village	Haroli Village	Kuthar Beet
1	*Escherichia coli*	IS-15185	—	Absent/100ml	-	Absent	Absent	Absent	Absent
2	*Coliform Bacteria*	IS-15185	—	Absent/100ml	-	Absent	Absent	Absent	Absent
3	Colour	IS-3025(P-04)	Hazen	5	15	<1.0	<1.0	<1.0	<1.0
4	Odour	IS-3025(P-05)	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Conductivity	IS:3025(Part-14)	µmhos/cm	-	-	486	606	462	640
6	Turbidity	IS-3025(P-10)	NTU	1	5	<1.0	<1.0	<1.0	<1.0
7	pH value	IS-3025(P-04)	-	6.5-8.5	-	7.23	7.46	7.30	7.25
8	Total Dissolve Solid (TDS)	IS-3025(P-16)	mg/l	500	2000	312	389	296	410
9	Boron (as B)	IS: 3025 (P- 57)	mg/l	0.5	2.4	<0.10	<0.10	<0.10	<0.10
10	Calcium (as Ca)	IS: 3025 (P- 40)	mg/l	75	200	64.50	62.18	65.80	61.60
11	Chloride (as Cl)	IS: 3025 (P- 32)	mg/l	250	1000	18.60	15.40	14.21	16.20
12	Copper (as Cu)	IS: 3025 (P-42)	mg/l	0.05	1.5	<0.05	<0.05	<0.05	<0.05
13	Fluoride (as F)	IS: 3025 (P-60)	mg/l	1	1.5	0.42	0.38	0.32	0.36
14	Phenolic Compound as (C_6H_5OH)	IS: 3025 (P- 43)	mg/l	0.001	0.002	<0.001	<0.001	<0.001	<0.001
15	Iron (as Fe)	IS: 3025(P-52)	mg/l	1	No Relaxation	0.121	0.118	0.112	0.126
16	Magnesium (as Mg)	IS: 3025 (P-46)	mg/l	30	100	12.40	5.19	15.12	2.91
17	Manganese (as Mn)	Clause 35 of IS 3025	mg/l	0.1	0.3	<0.1	<0.1	<0.1	<0.1
18	Nitrate (as NO_3)	IS: 3025 (P- 34)	mg/l	45	No Relaxation	3.97	3.60	2.98	3.45

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19	Sulphate (as SO_4)	IS: 3025 (P- 24)	mg/l	200	400	23.54	21.80	24.05	26.48
20	Free Residual Chlorine	IS: 3025 (P-26)	mg/l	0.2	1	<0.1	<0.1	<0.1	<0.1
21	Alkalinity (as Ca CO_3)	IS: 3025 (P- 23)	mg/l	200	600	154	162	135	178
22	Total Hardness (as $CaCO_3$)	IS: 3025 (P- 23)	mg/l	200	600	110	134	102	166
23	Zinc (as Zn)	IS: 3025 (P- 49)	mg/l	5.0	15	0.134	0.118	0.110	0.124
24	Cadmium (as Cd)	IS-3025(P-41)	mg/l	0.003	No Relaxation	<0.001	<0.001	<0.001	<0.001
25	Cyanide (as CN)	IS-3025(P-27)	mg/l	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01
26	Lead (as Pb)	IS-3025(P-47)	mg/l	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01
27	Mercury (as Hg)	IS-3025(P-48)	mg/l	0.001	No Relaxation	<0.001	<0.001	<0.001	<0.001
28	Nickel (as Ni)	Annex L of IS-13428	mg/l	0.02	No Relaxation	<0.01	<0.01	<0.01	<0.01
29	Arsenic (as As)	IS-3025(P-37)	mg/l	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01
30	Total Chromium (as Cr)	Annex J of IS-13428	mg/l	0.05	No Relaxation	<0.05	<0.05	<0.05	<0.05

Notes: -

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
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3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Water	W-261222-013	06/01/2023

Issued To: M/s Lakhwinder Singh Stone Crusher and Screening (Unit - 1)

Project Name: Sh. Lakhwinder Singh S/o Sh. Jagmail Singh

Location: Khasra Nos. 1165, 1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227 measuring 7-21-35 ha. (Private Land/Hill Slope) falling in Mauza Kutharbeet, Mohal Jorrian Kutharbeet, Tehsil Haroli, Distt. Una, H.P.

SAMPLING & ANALYSIS DATA

Sample Received on : 24/12/2022
Sample Drawn By : NTL Representative
Sample Quantity : 2.0 lit. + 500 ml.
Analysis Duration : 26/12/2022 to 31/12/2022
Sample Description : Ground Water

S.No.	Parameter	Test Method	Unit	Desirable Limit	Permissible Limit	Polian	Dulehar
1	*Escherichia coli*	IS-15185	—	Absent/100ml	–	Absent	Absent
2	*Colform Bacteria*	IS-15185	—	Absent/100ml	–	Absent	Absent
3	Colour	IS-3025(P-04)	Hazen	5	15	<1.0	<1.0
4	Odour	IS-3025(P-05)	-	Agreeable	Agreeable	Agreeable	Agreeable
5	Conductivity	IS:3025(Part-14)	µmhos/cm	-	-	580	624
6	Turbidity	IS-3025(P-10)	NTU	1	5	<1.0	<1.0
7	pH value	IS-3025(P-04)	-	6.5-8.5	-	7.41	7.34
8	Total Dissolve Solid (TDS)	IS-3025(P-16)	mg/l	500	2000	372	400
9	Boron (as B)	IS: 3025 (P- 57)	mg/l	0.5	2.4	<0.10	<0.10
10	Calcium (as Ca)	IS: 3025 (P- 40)	mg/l	75	200	60.12	64.80
11	Chloride (as Cl)	IS: 3025 (P- 32)	mg/l	250	1000	14.56	18.02
12	Copper (as Cu)	IS: 3025 (P-42)	mg/l	0.05	1.5	<0.05	<0.05
13	Fluoride (as F)	IS: 3025 (P-60)	mg/l	1	1.5	0.26	0.38
14	Phenolic Compound as (C_6H_5OH)	IS: 3025 (P- 43)	mg/l	0.001	0.002	<0.001	<0.001
15	Iron (as Fe)	IS: 3025(P-52)	mg/l	1	No Relaxation	0.123	0.116
16	Magnesium (as Mg)	IS: 3025 (P-46)	mg/l	30	100	5.39	2.91
17	Manganese (as Mn)	Clause 35 of IS 3025	mg/l	0.1	0.3	<0.1	<0.1

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18	Nitrate (as NO_3)	IS: 3025 (P- 34)	mg/l	45	No Relaxation	2.50	3.18
19	Sulphate (as SO_4)	IS: 3025 (P- 24)	mg/l	200	400	27.16	24.85
20	Free Residual Chlorine	IS: 3025 (P-26)	mg/l	0.2	1	<0.1	<0.1
21	Alkalinity (as Ca CO_3)	IS: 3025 (P- 23)	mg/l	200	600	147	172
22	Total Hardness (as $CaCO_3$)	IS: 3025 (P- 23)	mg/l	200	600	128	150
23	Zinc (as Zn)	IS: 3025 (P- 49)	mg/l	5.0	15	0.127	0.124
24	Cadmium (as Cd)	IS-3025(P-41)	mg/l	0.003	No Relaxation	<0.001	<0.001
25	Cyanide (as CN)	IS-3025(P-27)	mg/l	0.05	No Relaxation	<0.01	<0.01
26	Lead (as Pb)	IS-3025(P-47)	mg/l	0.01	No Relaxation	<0.01	<0.01
27	Mercury (as Hg)	IS-3025(P-48)	mg/l	0.001	No Relaxation	<0.001	<0.001
28	Nickel (as Ni)	Annex L of IS-13428	mg/l	0.02	No Relaxation	<0.01	<0.01
29	Arsenic (as As)	IS-3025(P-37)	mg/l	0.01	No Relaxation	<0.01	<0.01
30	Total Chromium (as Cr)	Annex J of IS-13428	mg/l	0.05	No Relaxation	<0.05	<0.05

Notes: -

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Soil Quality	SQ-261222-010	06/01/2023

Issued To: M/s Lakhwinder Singh Stone Crusher and Screening (Unit - 1)

Project Name: Sh. Lakhwinder Singh S/o Sh. Jagmail Singh

Location: Khasra Nos. 1165, 1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227 measuring 7-21-35 ha. (Private Land/Hill Slope) falling in Mauza Kutharbeet, Mohal Jorrian Kutharbeet, Tehsil Haroli, Distt. Una, H.P.

Sampling & Analysis Data

Sample Drawn On	:	24/12/2022
Sample Description	:	Soil Sample
Sample Quantity	:	2.0 Kg
Sample Drawn By	:	NTL Representative
Analysis Duration	:	26/12/2022 to 31/12/2022

S. No.	Parameters	Unit	Test Method	Project Site	Polian Beet	Kuthar Beet	Pubowal	Baliwal	Haroli
	Physical Characteristics								
1	Texture	USDA	STP/SOIL	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam
2	Porosity	%	STP/SOIL	53.2	54.7	52.5	52.8	54.7	55.5
3	Bulk Density	gm/cc	STP/SOIL	1.24	1.20	1.26	1.25	1.20	1.18
4	Water Holding Capacity	%	STP/SOIL	24.0	26.0	25.0	23.0	25.0	24.0
5	Permeability	cm/hr	STP/SOIL	1.18	1.34	1.30	1.26	1.42	1.21
6	**Particle Size Distribution**								
a.	Sand	%	STP/SOIL	65.00	62.00	68.00	66.00	62.10	60.00
b.	Silt	%	STP/SOIL	15.00	18.00	13.50	12.00	15.20	16.00
c.	Clay	%	STP/SOIL	20.00	20.00	18.50	22.00	22.70	24.00
7	Texture			Sandy clay loam	Sandy clay loam	Sandy loam	Sandy clay loam	Sandy clay loam	Sandy clay loam
	Chemical Characteristics								
7	pH	-	IS:2720(Part-26)	7.54	7.89	7.12	7.60	7.26	7.40
8	Conductivity (EC)	µS/cm	IS:2720(Part-21)	280	312	350	326	398	320
9	CEC	meq/100gm	STP/SOIL	9.78	11.16	11.39	11.93	11.12	10.62
10	Organic Carbon	%	STP/SOIL	0.59	0.62	0.59	0.60	0.62	0.63
11	Organic Matter	%	STP/SOIL	1.01	1.07	1.00	1.03	1.07	1.08
12	SAR	-	STP/SOIL	2.11	2.13	1.85	1.96	2.17	2.19

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S. No.	Parameters	Unit	Test Method	Project Site	Polian Beet	Kuthar Beet	Pubowal	Baliwal	Haroli
13	Chloride as Cl	mg/kg	STP/SOIL	156.0	125.0	154.0	138.0	142.2	138.0
14	Calcium	mg/kg	STP/SOIL	860.0	923.0	950.0	1016.0	886.0	915.0
15	Magnesium as Mg	mg/kg	STP/SOIL	368.8	478.2	510.0	525.0	488.6	417.0
16	Sodium as Na	Mg/kg	STP/Soil	225.1	252.3	225.1	242.6	256.7	245.2
17	Zinc as Zn	mg/kg	STP/SOIL	2.14	1.89	2.34	1.78	1.65	2.54
16	Iron as Fe	mg/kg	STP/SOIL	7.02	5.61	8.85	4.60	7.14	8.20
17	Copper as Cu	mg/kg	STP/SOIL	0.21	0.35	0.27	0.32	0.25	0.26
18	Manganese as Mn	mg/kg	STP/SOIL	0.78	0.52	0.60	0.58	0.64	0.54
19	Exchangeable Sodium	%	STP/SOIL	10.0	9.8	8.6	8.8	10.0	10.0
20	Arsenic (as As)	mg/kg	STP/SOIL	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)
21	Lead (as Pb)	mg/kg	STP/SOIL	12.8	16.5	14.3	10.5	15.0	12.2
22	Cadmium (as Cd)	mg/kg	STP/SOIL	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)
23	Chromium (as Cr)	mg/kg	STP/SOIL	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)
24	Nickel (as Ni)	mg/kg	STP/SOIL	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)	BDL (<0.1)
	Available Nutrients								
25	Nitrogen as N	kg/ha	STP/SOIL	287.0	340.0	266.0	265.0	335.0	342.0
26	Phosphorus as P	kg/ha	STP/SOIL	19.3.0	21.0	17.1	17.8	20.7	22.4
27	Potassium as K	kg/ha	STP/SOIL	167.0	182.0	162.0	165.0	195.0	197.0

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Ambient Air Quality Analysis	AAQ-051022-01	06/01/2023

Issued To: M/s Lakhwinder Singh Stone Crusher and Screening (Unit - 1)

Project Name: Sh. Lakhwinder Singh S/o Sh. Jagmail Singh

Location: Khasra Nos. 1165, 1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227 measuring 7-21-35 ha. (Private Land/Hill Slope) falling in Mauza Kutharbeet, Mohal Jorrian Kutharbeet, Tehsil Haroli, Distt. Una, H.P.

Sampling & Analysis Data

Sample Drawn By	NTL Representative	: Monitoring Period	Oct 2022 - Dec 2022
Sampling Location	Project Site (Upside)	: Protocol Used	CPCB Guidelines
Sampling Plan & Procedure	SOP-AAQ/08	: Sampling Instrument Used	Respirable Dust Sampler (PM_{10}), Fine Particulate ($PM_{2.5}$) Sampler

S. No.	Monitoring Date	PM_{10}	$PM_{2.5}$	SO_2	NO_2	CO	NH_3	O_3
1	05.10.2022	45.12	18.4	5.18	9.6	0.36	<20.0	<10.0
2	08.10.2022	44.98	16.78	6.48	8.84	0.65	<20.0	<10.0
3	12.10.2022	49.23	17.74	5.42	9.83	0.32	<20.0	<10.0
4	15.10.2022	44.86	16.72	7.45	8.88	0.42	<20.0	<10.0
5	19.10.2022	44.86	18.78	5.48	9.89	0.52	<20.0	<10.0
6	22.10.2022	45.01	20.77	6.49	10.87	0.62	<20.0	<10.0
7	26.10.2022	44.92	19.8	7.47	8.85	0.42	<20.0	<10.0
8	29.10.2022	44.89	16.74	5.03	9.82	0.62	<20.0	<10.0
9	02.11.2022	53.4	21.73	6.41	8.84	0.47	<20.0	<10.0
10	05.11.2022	44.88	16.8	5.42	9.83	0.52	<20.0	<10.0
11	09.11.2022	44.96	23.84	6.45	10.9	0.42	<20.0	<10.0
12	12.11.2022	40.92	16.82	5.5	10.88	0.62	<20.0	<10.0
13	16.11.2022	44.95	18.92	7.47	9.83	0.52	<20.0	<10.0
14	19.11.2022	45.03	16.93	6.53	8.84	0.56	<20.0	<10.0
15	23.11.2022	40.96	17.88	5.49	9.92	0.62	<20.0	<10.0
16	26.11.2022	45.08	18.79	7.54	10.85	0.7	<20.0	<10.0
17	01.12.2022	42.87	16.74	5.47	9.87	0.72	<20.0	<10.0
18	02.12.2022	44.86	18.78	7.42	9.83	0.52	<20.0	<10.0
19	05.12.2022	44.83	22.84	6.43	10.82	0.62	<20.0	<10.0
20	06.12.2022	42.91	18.89	5.59	9.92	0.88	<20.0	<10.0
21	10.12.2022	44.96	16.93	6.48	8.88	0.92	<20.0	<10.0
22	11.12.2022	45.03	21.78	5.47	8.85	0.62	<20.0	<10.0
23	14.12.2022	44.8	16.8	6.44	9.87	0.66	<20.0	<10.0
24	15.12.2022	44.86	20.7	5.25	10.8	0.42	<20.0	<10.0
Min		40.92	16.72	5.03	8.84	0.32	<20.0	<10.0
Max		53.4	23.84	7.54	10.9	0.92	<20.0	<10.0
Avg.		44.97	18.79	6.18	9.80	0.57	<20.0	<10.0
P 98		51.48	23.38	7.51	10.89	0.90		
NAAQS, For 24 hourly monitoring (except CO for Eight hour)		100 µg/m³	60 µg/m³	80 µg/m³	80 µg/m³	2 mg/m³	400 µg/m³	180 µg/m³

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Ambient Air Quality Analysis	AAQ-051022-02	06/01/2023

Issued To: M/s Lakhwinder Singh Stone Crusher and Screening (Unit - 1)

Project Name: Sh. Lakhwinder Singh S/o Sh. Jagmail Singh

Location: Khasra Nos. 1165, 1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227 measuring 7-21-35 ha. (Private Land/Hill Slope) falling in Mauza Kutharbeet, Mohal Jorrian Kutharbeet, Tehsil Haroli, Distt. Una, H.P.

Sampling & Analysis Data

Sample Drawn By	NTL Representative	:	Monitoring Period	:	Oct 2022 - Dec 2022
Sampling Location	Project Site (Center)	:	Protocol Used	:	CPCB Guidelines
Sampling Plan & Procedure	SOP-AAQ/08	:	Sampling Instrument Used	:	Respirable Dust Sampler (PM_{10}), Fine Particulate ($PM_{2.5}$) Sampler

S. No.	Monitoring Date	PM_{10}	$PM_{2.5}$	SO_2	NO_2	CO	NH_3	O_3
1	05.10.2022	50.28	19.43	7.36	9.52	0.61	<20.0	<10.0
2	08.10.2022	51.7	21.48	7.39	10.59	0.74	<20.0	<10.0
3	12.10.2022	48.29	22.75	7.37	8.66	0.43	<20.0	<10.0
4	15.10.2022	43.25	19.6	7.65	8.8	0.26	<20.0	<10.0
5	19.10.2022	43.3	21.49	6.42	6.55	0.61	<20.0	<10.0
6	22.10.2022	47.32	20.69	7.39	9.58	0.27	<20.0	<10.0
7	26.10.2022	52.85	17.62	7.37	7.64	0.43	<20.0	<10.0
8	29.10.2022	43.39	19.47	7.42	6.69	0.61	<20.0	<10.0
9	02.11.2022	43.2	20.67	6.41	7.55	0.26	<20.0	<10.0
10	05.11.2022	46.36	18.62	6.3	6.5	0.54	<20.0	<10.0
11	09.11.2022	43.38	16.53	6.38	6.58	0.35	<20.0	<10.0
12	12.11.2022	43.39	16.67	6.46	7.62	0.47	<20.0	<10.0
13	16.11.2022	45.82	18.4	7.37	10.56	0.65	<20.0	<10.0
14	19.11.2022	43.79	16.63	7.42	6.52	0.34	<20.0	<10.0
15	23.11.2022	43.88	17.52	6.39	6.53	0.46	<20.0	<10.0
16	26.11.2022	41.26	15.46	6.47	7.63	0.57	<20.0	<10.0
17	01.12.2022	43.55	15.43	6.42	9.55	0.31	<20.0	<10.0
18	02.12.2022	43.68	18.61	5.67	6.69	0.49	<20.0	<10.0
19	05.12.2022	43.74	15.6	5.37	7.74	0.63	<20.0	<10.0
20	06.12.2022	43.53	15.43	5.46	10.68	0.38	<20.0	<10.0
21	10.12.2022	43.67	16.58	6.41	7.75	0.42	<20.0	<10.0
22	11.12.2022	43.81	15.46	6.52	6.55	0.59	<20.0	<10.0
23	14.12.2022	43.76	15.57	5.49	6.65	0.34	<20.0	<10.0
24	15.12.2022	43.36	14.69	6.46	6.69	0.43	<20.0	<10.0
Min		41.26	14.69	5.37	6.5	0.26	<20.0	<10.0
Max		52.85	22.75	7.65	10.68	0.74	<20.0	<10.0
Avg.		45.02	17.93	6.64	7.91	0.47	<20.0	<10.0
P 98		52.32	22.17	7.54	10.64	0.70	<20.0	<10.0
NAAQS, For 24 hourly monitoring (except CO for Eight hour)		100 µg/m³	60 µg/m³	80 µg/m³	80 µg/m³	2 mg/m³	400 µg/m³	180 µg/m³

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Ambient Air Quality Analysis	AAQ-051022-03	06/01/2023

Issued To: M/s Lakhwinder Singh Stone Crusher and Screening (Unit - 1)

Project Name: Sh. Lakhwinder Singh S/o Sh. Jagmail Singh

Location: Khasra Nos. 1165, 1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227 measuring 7-21-35 ha. (Private Land/Hill Slope) falling in Mauza Kutharbeet, Mohal Jorrian Kutharbeet, Tehsil Haroli, Distt. Una, H.P.

Sampling & Analysis Data

Sample Drawn By	NTL Representative	:	Monitoring Period	:	Oct 2022 - Dec 2022
Sampling Location	Project Site (Downside)	:	Protocol Used	:	CPCB Guidelines
Sampling Plan & Procedure	SOP-AAQ/08	:	Sampling Instrument Used	:	Respirable Dust Sampler (PM_{10}), Fine Particulate ($PM_{2.5}$) Sampler

S. No.	Monitoring Date	PM_{10}	$PM_{2.5}$	SO_2	NO_2	CO	NH_3	O_3
1	05.10.2022	54.98	24.9	7.15	9.6	0.50	<20.0	<10.0
2	08.10.2022	44.67	16.78	6.48	8.84	0.67	<20.0	<10.0
3	12.10.2022	49.23	22.74	6.42	8.83	0.54	<20.0	<10.0
4	15.10.2022	47.86	16.72	5.93	10.64	0.49	<20.0	<10.0
5	19.10.2022	44.86	21.78	6.48	9.89	0.67	<20.0	<10.0
6	22.10.2022	45.91	16.77	6.49	9.87	0.61	<20.0	<10.0
7	26.10.2022	44.92	16.8	6.47	8.85	0.53	<20.0	<10.0
8	29.10.2022	44.89	16.74	6.43	9.82	0.35	<20.0	<10.0
9	02.11.2022	53.40	19.73	6.41	8.84	0.80	<20.0	<10.0
10	05.11.2022	44.88	16.8	6.42	9.83	0.39	<20.0	<10.0
11	09.11.2022	44.96	18.84	6.43	9.9	0.42	<20.0	<10.0
12	12.11.2022	44.92	18.82	6.5	10.23	0.49	<20.0	<10.0
13	16.11.2022	44.95	17.92	7.47	10.62	0.31	<20.0	<10.0
14	19.11.2022	51.03	17.93	7.53	9.84	0.50	<20.0	<10.0
15	23.11.2022	44.96	16.88	7.49	9.9	0.45	<20.0	<10.0
16	26.11.2022	45.08	16.79	6.54	9.85	0.34	<20.0	<10.0
17	01.12.2022	44.87	17.74	6.47	9.87	0.62	<20.0	<10.0
18	02.12.2022	44.86	17.78	7.42	8.83	0.51	<20.0	<10.0
19	05.12.2022	44.83	16.84	6.43	8.82	0.56	<20.0	<10.0
20	06.12.2022	42.76	18.89	6.59	8.9	0.35	<20.0	<10.0
21	10.12.2022	44.96	16.93	7.48	8.88	0.43	<20.0	<10.0
22	11.12.2022	45.03	16.78	7.47	8.85	0.68	<20.0	<10.0
23	14.12.2022	44.[illegible]	16.83	6.44	8.87	0.29	<20.0	<10.0
24	15.12.2022	44.86	15.94	6.4	8.8	0.40	<20.0	<10.0
Min		42.76	15.94	5.93	8.8	0.29	<20.0	<10.0
Max		54.98	24.9	7.53	10.64	0.80	<20.0	<10.0
Avg.		46.15	18.11	6.72	9.47	0.50	<20.0	<10.0
P 98		54.25	23.91	7.51	10.63	0.74	<20.0	<10.0
NAAQS, For 24 hourly monitoring (except CO for Eight hour)		100 µg/m³	60 µg/m³	80 µg/m³	80 µg/m³	2 mg/m³	400 µg/m³	180 µg/m³

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Ambient Air Quality Analysis	AAQ-051022-04	06/01/2023

Issued To: M/s Lakhwinder Singh Stone Crusher and Screening (Unit - 1)

Project Name: Sh. Lakhwinder Singh S/o Sh. Jagmail Singh

Location: Khasra Nos. 1165, 1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227 measuring 7-21-35 ha. (Private Land/Hill Slope) falling in Mauza Kutharbeet, Mohal Jorrian Kutharbeet, Tehsil Haroli, Distt. Una, H.P.

Sampling & Analysis Data

Sample Drawn By	NTL Representative	:	**Monitoring Period**	Oct 2022 - Dec 2022
Sampling Location	Lakh Data Peer Mandir Panjoiyan	:	**Protocol Used**	CPCB Guidelines
Sampling Plan & Procedure	SOP-AAQ/08	:	**Sampling Instrument Used**	Respirable Dust Sampler (PM_{10}), Fine Particulate ($PM_{2.5}$) Sampler

S. No.	Monitoring Date	PM_{10}	$PM_{2.5}$	SO_2	NO_2	CO	NH_3	O_3
1	05.10.2022	40.22	16.4	5.35	8.54	0.55	<20.0	<10.0
2	08.10.2022	38.46	14.32	6.84	9.94	0.46	<20.0	<10.0
3	12.10.2022	41.45	15.36	7.82	10.97	0.49	<20.0	<10.0
4	15.10.2022	42.28	14.35	6.83	9.93	0.52	<20.0	<10.0
5	19.10.2022	35.41	18.37	7.81	8.94	0.47	<20.0	<10.0
6	22.10.2022	42.69	14.35	6.89	9.96	0.5	<20.0	<10.0
7	26.10.2022	43.11	19.39	7.83	10.24	0.55	<20.0	<10.0
8	29.10.2022	43.21	14.38	5.87	9.97	0.53	<20.0	<10.0
9	02.11.2022	38.58	21.38	7.8	9.93	0.51	<20.0	<10.0
10	05.11.2022	44.12	14.39	6.9	8.99	0.47	<20.0	<10.0
11	09.11.2022	42.4	15.37	7.87	8.97	0.45	<20.0	<10.0
12	12.11.2022	41.47	14.4	7.88	9.94	0.53	<20.0	<10.0
13	16.11.2022	38.46	15.39	7.89	10.93	0.51	<20.0	<10.0
14	19.11.2022	39.55	20.42	6.89	9.91	0.55	<20.0	<10.0
15	23.11.2022	37.05	16.35	7.24	10.96	0.49	<20.0	<10.0
16	26.11.2022	41.56	14.36	5.94	9.97	0.54	<20.0	<10.0
17	01.12.2022	36.04	16.43	7.83	10.98	0.52	<20.0	<10.0
18	02.12.2022	43.28	20.42	5.82	9.96	0.49	<20.0	<10.0
19	05.12.2022	43.16	18.39	6.84	9.99	0.48	<20.0	<10.0
20	06.12.2022	45.02	14.37	5.87	8.97	0.45	<20.0	<10.0
21	10.12.2022	41.47	21.03	6.83	8.96	0.54	<20.0	<10.0
22	11.12.2022	42.5	14.42	5.88	10.94	0.52	<20.0	<10.0
23	14.12.2022	41.44	20.48	6.87	10.93	0.52	<20.0	<10.0
24	15.12.2022	40.47	14.34	5.8	9.9	0.5	<20.0	<10.0
Min		35.41	14.32	5.35	8.54	0.45	<20.0	<10.0
Max		45.02	21.38	7.89	10.98	0.55	<20.0	<10.0
Avg.		40.98	16.62	6.89	9.95	0.51	<20.0	<10.0
P 98		44.61	21.22	7.89	10.98	0.55	<20.0	<10.0
NAAQS, For 24 hourly monitoring (except CO for Eight hour)		100 µg/m³	60 µg/m³	80 µg/m³	80 µg/m³	2 mg/m³	400 µg/m³	180 µg/m³

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Ambient Air Quality Analysis	AAQ-061022-05	06/01/2023

Issued To: M/s Lakhwinder Singh Stone Crusher and Screening (Unit - 1)

Project Name: Sh. Lakhwinder Singh S/o Sh. Jagmail Singh

Location: Khasra Nos. 1165, 1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227 measuring 7-21-35 ha. (Private Land/Hill Slope) falling in Mauza Kutharbeet, Mohal Jorrian Kutharbeet, Tehsil Haroli, Distt. Una, H.P.

Sampling & Analysis Data

Sample Drawn By	NTL Representative	:	**Monitoring Period**	Oct 2022 - Dec 2022	
Sampling Location	Govt. Primary School Kuthar Beet	:	**Protocol Used**	CPCB Guidelines	
Sampling Plan & Procedure	SOP-AAQ/08	:	**Sampling Instrument Used**	Respirable Dust Sampler (PM_{10}), Fine Particulate ($PM_{2.5}$) Sampler	

S. No.	Monitoring Date	PM_{10}	$PM_{2.5}$	SO_2	NO_2	CO	NH_3	O_3
1	06.10.2022	40.6	13.78	4.82	6.18	0.41	<20.0	<10.0
2	09.10.2022	45.74	13.69	4.89	6.2	0.40	<20.0	<10.0
3	13.10.2022	40.86	13.73	4.91	6.38	0.20	<20.0	<10.0
4	16.10.2022	47.2x	13.76	4.93	6.29	0.62	<20.0	<10.0
5	20.10.2022	45.75	13.82	4.97	6.64	0.51	<20.0	<10.0
6	23.10.2022	42.63	13.84	6.25	7.31	0.50	<20.0	<10.0
7	27.10.2022	43.52	13.92	3.84	6.28	0.41	<20.0	<10.0
8	30.10.2022	44.14	13.69	4.88	6.3	0.40	<20.0	<10.0
9	03.11.2022	44.25	15.93	4.89	6.34	0.50	<20.0	<10.0
10	06.11.2022	44.14	9.57	4.86	6.52	0.51	<20.0	<10.0
11	10.11.2022	41.36	14.11	4.92	6.39	0.52	<20.0	<10.0
12	13.11.2022	40.29	13.88	4.93	6.46	0.40	<20.0	<10.0
13	17.11.2022	36.67	13.83	5.01	6.46	0.19	<20.0	<10.0
14	20.11.2022	38.69	13.86	4.96	6.48	0.51	<20.0	<10.0
15	24.11.2022	38.77	14.02	4.85	6.43	0.41	<20.0	<10.0
16	27.11.2022	41.25	13.98	4.86	6.31	0.42	<20.0	<10.0
17	02.12.2022	42.63	14.09	4.83	6.29	0.20	<20.0	<10.0
18	05.12.2022	42.25	13.86	5.02	6.39	0.41	<20.0	<10.0
19	09.12.2022	45.75	13.72	4.82	5.81	0.51	<20.0	<10.0
20	12.12.2022	45.21	14.2	4.83	6.33	0.40	<20.0	<10.0
21	16.12.2022	44.15	13.68	4.87	6.35	0.41	<20.0	<10.0
22	19.12.2022	41.245	14.13	5.1	6.25	0.51	<20.0	<10.0
23	23.12.2022	41.63	13.84	4.86	6.39	0.63	<20.0	<10.0
24	26.12.2022	40.38	13.92	4.97	6.42	0.50	<20.0	<10.0
Min		**36.67**	**9.57**	**3.84**	**5.81**	**0.19**	**<20.0**	**<10.0**
Max		**47.21**	**15.93**	**6.25**	**7.31**	**0.63**	**<20.0**	**<10.0**
Avg.		**42.46**	**13.79**	**4.92**	**6.38**	**0.44**	**<20.0**	**<10.0**
P 98		**46.54**	**15.13**	**5.72**	**7.00**	**0.63**	**<20.0**	**<10.0**
NAAQS, For 24 hourly monitoring (except CO for Eight hour)		**100 µg/m³**	**60 µg/m³**	**80 µg/m³**	**80 µg/m³**	**2 mg/m³**	**400 µg/m³**	**180 µg/m³**

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Ambient Air Quality Analysis	AAQ-061022-06	06/01/2023

Issued To: M/s Lakhwinder Singh Stone Crusher and Screening (Unit - 1)

Project Name: Sh. Lakhwinder Singh S/o Sh. Jagmail Singh

Location: Khasra Nos. 1165, 1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227 measuring 7-21-35 ha. (Private Land/Hill Slope) falling in Mauza Kutharbeet, Mohal Jorrian Kutharbeet, Tehsil Haroli, Distt. Una, H.P.

Sampling & Analysis Data

Sample Drawn By	NTL Representative	:	**Monitoring Period**	:	Oct 2022 - Dec 2022
Sampling Location	Gram Panchayat Baliwal	:	**Protocol Used**	:	CPCB Guidelines
Sampling Plan & Procedure	SOP-AAQ/08	:	**Sampling Instrument Used**	:	Respirable Dust Sampler (PM_{10}), Fine Particulate ($PM_{2.5}$) Sampler

S. No.	Monitoring Date	PM_{10}	$PM_{2.5}$	SO_2	NO_2	CO	NH_3	O_3
1	06.10.2022	40.5	23.9	6.93	9.26	0.57	<20.0	<10.0
2	09.10.2022	44.1	25.96	6.22	10.75	0.52	<20.0	<10.0
3	13.10.2022	45.33	21.94	7.43	9.37	0.51	<20.0	<10.0
4	16.10.2022	47.16	20.96	6.45	8.6	0.49	<20.0	<10.0
5	20.10.2022	52.97	25.93	5.89	9.48	0.54	<20.0	<10.0
6	23.10.2022	50.25	32.97	6.31	9.63	0.57	<20.0	<10.0
7	27.10.2022	49.03	28.94	7.75	10.36	0.51	<20.0	<10.0
8	30.10.2022	48.97	29.97	5.78	9.47	0.58	<20.0	<10.0
9	03.11.2022	45.05	30.91	7.06	11.52	0.5	<20.0	<10.0
10	06.11.2022	42.21	28.95	6.85	10.96	0.53	<20.0	<10.0
11	10.11.2022	45.06	27.94	7.68	9.58	0.48	<20.0	<10.0
12	13.11.2022	47.1	28.91	6.38	10.99	0.51	<20.0	<10.0
13	17.11.2022	49.99	26.95	7.54	9.63	0.54	<20.0	<10.0
14	20.11.2022	47.13	28.96	5.84	12.48	0.54	<20.0	<10.0
15	24.11.2022	52.06	25.99	7.58	9.48	0.55	<20.0	<10.0
16	27.11.2022	49.96	28.97	6.44	11.36	0.51	<20.0	<10.0
17	02.12.2022	51.31	31.06	5.89	9.85	0.47	<20.0	<10.0
18	05.12.2022	50.46	29.07	8.18	12.53	0.55	<20.0	<10.0
19	09.12.2022	52.01	30.1	6.89	11.45	0.52	<20.0	<10.0
20	12.12.2022	40.02	28.98	6.82	9.63	0.52	<20.0	<10.0
21	16.12.2022	49.11	27.95	6.45	10.56	0.52	<20.0	<10.0
22	19.12.2022	50.23	29.03	7.06	13.2	0.59	<20.0	<10.0
23	23.12.2022	51.02	28.1	8.2	9.63	0.49	<20.0	<10.0
24	26.12.2022	52.9	28.9	7.56	10.14	0.54	<20.0	<10.0
Min		40.02	20.96	5.78	8.6	0.47	<20.0	<10.0
Max		52.97	32.97	8.2	13.2	0.59	<20.0	<10.0
Avg.		48.08	27.97	6.88	10.41	0.53	<20.0	<10.0
P 98		52.94	32.09	8.19	12.89	0.59	<20.0	<10.0
NAAQS, For 24 hourly monitoring (except CO for Eight hour)		100 µg/m³	60 µg/m³	80 µg/m³	80 µg/m³	2 mg/m³	400 µg/m³	180 µg/m³

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TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Ambient Air Quality Analysis	AAQ-061022-07	06/01/2023

Issued To: M/s Lakhwinder Singh Stone Crusher and Screening (Unit - 1)

Project Name: Sh. Lakhwinder Singh S/o Sh. Jagmail Singh

Location: Khasra Nos. 1165, 1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227 measuring 7-21-35 ha. (Private Land/Hill Slope) falling in Mauza Kutharbeet, Mohal Jorrian Kutharbeet, Tehsil Haroli, Distt. Una, H.P.

Sampling & Analysis Data

Sample Drawn By	NTL Representative	:	Monitoring Period	Oct 2022 - Dec 2022
Sampling Location	Govt. School Badhera	:	Protocol Used	CPCB Guidelines
Sampling Plan & Procedure	SOP-AAQ/08	:	Sampling Instrument Used	Respirable Dust Sampler (PM_{10}), Fine Particulate ($PM_{2.5}$) Sampler

S. No.	Monitoring Date	PM_{10}	$PM_{2.5}$	SO_2	NO_2	CO	NH_3	O_3
1	06.10.2022	41.63	16.52	5.21	7.53	0.37	<20.0	<10.0
2	09.10.2022	42.58	14.78	4.93	7.48	0.25	<20.0	<10.0
3	13.10.2022	41.02	23.47	6.51	7.09	0.29	<20.0	<10.0
4	16.10.2022	40.63	14.63	5.32	8.11	0.35	<20.0	<10.0
5	20.10.2022	45.63	15.63	6.25	8.2	0.52	<20.0	<10.0
6	23.10.2022	46.58	15.24	5.48	9.23	0.47	<20.0	<10.0
7	27.10.2022	50.63	16.33	5.96	9.78	0.62	<20.0	<10.0
8	30.10.2022	40.75	15.24	5.47	8.86	0.41	<20.0	<10.0
9	03.11.2022	42.5	14.25	5.66	8.58	0.32	<20.0	<10.0
10	06.11.2022	41.17	15.44	6.12	7.52	0.29	<20.0	<10.0
11	10.11.2022	41.52	13.89	4.92	7.45	0.26	<20.0	<10.0
12	13.11.2022	42.35	13.6	6.3	8.1	0.43	<20.0	<10.0
13	17.11.2022	40.63	13.79	6.25	9.5	0.50	<20.0	<10.0
14	20.11.2022	41.06	14.65	5.89	9.9	0.48	<20.0	<10.0
15	24.11.2022	39.86	15.78	5.74	7.52	0.20	<20.0	<10.0
16	27.11.2022	46.35	16.24	5.23	7.63	0.24	<20.0	<10.0
17	02.12.2022	42.41	14.85	5.24	9.58	0.31	<20.0	<10.0
18	05.12.2022	46.52	20.54	4.96	9.93	0.39	<20.0	<10.0
19	09.12.2022	42.52	16.53	4.99	7.96	0.52	<20.0	<10.0
20	12.12.2022	40.8	19.56	5.63	8.12	0.27	<20.0	<10.0
21	16.12.2022	42.63	18.74	5.78	8.14	0.36	<20.0	<10.0
22	19.12.2022	40.58	17.65	5.47	7.65	0.45	<20.0	<10.0
23	23.12.2022	43.42	13.19	5.89	7.43	0.23	<20.0	<10.0
24	26.12.2022	43.52	20.63	6.11	7.42	0.59	<20.0	<10.0
Min		39.86	13.19	4.92	7.09	0.20	<20.0	<10.0
Max		50.63	23.47	6.51	9.93	0.62	<20.0	<10.0
Avg.		42.80	16.30	5.64	8.28	0.38	<20.0	<10.0
P 98		48.77	22.16	6.41	9.92	0.61	<20.0	<10.0
NAAQS, For 24 hourly monitoring (except CO for Eight hour)		100 µg/m³	60 µg/m³	80 µg/m³	80 µg/m³	2 mg/m³	400 µg/m³	180 µg/m³

Ajay
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AUTHORIZED SIGNATORY

NOIDA TESTING LABORATORIES

(A Government of India Approved Testing Laboratory)

(An ISO : 9001 : 2015, ISO 45001 : 2018 (OH&S) Certified & NABL Accredited Laboratory)

MoEF & CC (Ministry of Environment, Forest & Climate Change), UPPCB Recognized Laboratory

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+91-9313611642, 8510081921, 7503031145, 8527870572, 7503031146, 9999794369

TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Ambient Air Quality Analysis	AAQ-061022-08	06/01/2023

Issued To: M/s Lakhwinder Singh Stone Crusher and Screening (Unit - 1)

Project Name: Sh. Lakhwinder Singh S/o Sh. Jagmail Singh

Location: Khasra Nos. 1165, 1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227 measuring 7-21-35 ha. (Private Land/Hill Slope) falling in Mauza Kutharbeet, Mohal Jorrian Kutharbeet, Tehsil Haroli, Distt. Una, H.P.

Sampling & Analysis Data

Sample Drawn By	NTL Representative	:	**Monitoring Period**	Oct 2022 - Dec 2022	
Sampling Location	PWD Guest House Haroli	:	**Protocol Used**	CPCB Guidelines	
Sampling Plan & Procedure	SOP-AAQ/08	:	**Sampling Instrument Used**	Respirable Dust Sampler (PM_{10}), Fine Particulate ($PM_{2.5}$) Sampler	

S. No.	Monitoring Date	PM_{10}	$PM_{2.5}$	SO_2	NO_2	CO	NH_3	O_3
1	06.10.2022	52.81	22.46	9.18	12.5	0.68	<20.0	<10.0
2	09.10.2022	41.46	24.32	8.84	14.94	0.26	<20.0	<10.0
3	13.10.2022	41.45	19.36	8.82	11.97	0.32	<20.0	<10.0
4	16.10.2022	42.28	20.35	9.83	13.93	0.39	<20.0	<10.0
5	20.10.2022	38.71	19.37	9.81	11.94	0.41	<20.0	<10.0
6	23.10.2022	44.69	21.35	8.89	12.96	0.35	<20.0	<10.0
7	27.10.2022	46.11	20.39	6.83	12.98	0.27	<20.0	<10.0
8	30.10.2022	45.21	22.38	6.87	11.97	0.31	<20.0	<10.0
9	03.11.2022	43.58	20.38	6.8	12.93	0.52	<20.0	<10.0
10	06.11.2022	47.12	17.39	7.9	12.99	0.59	<20.0	<10.0
11	10.11.2022	48.4	18.37	7.87	11.97	0.21	<20.0	<10.0
12	13.11.2022	43.47	18.4	8.88	11.94	0.29	<20.0	<10.0
13	17.11.2022	45.46	18.39	8.89	11.93	0.34	<20.0	<10.0
14	20.11.2022	41.5	18.4	8.89	10.91	0.47	<20.0	<10.0
15	24.11.2022	47.05	16.35	7.9	10.96	0.42	<20.0	<10.0
16	27.11.2022	41.56	16.36	7.94	10.97	0.22	<20.0	<10.0
17	02.12.2022	43.04	18.4	7.83	10.98	0.53	<20.0	<10.0
18	05.12.2022	43.28	16.42	6.82	10.96	0.39	<20.0	<10.0
19	09.12.2022	43.16	17.39	6.84	10.99	0.53	<20.0	<10.0
20	12.12.2022	44.02	17.37	6.87	9.97	0.61	<20.0	<10.0
21	16.12.2022	44.47	16.33	7.83	9.96	0.63	<20.0	<10.0
22	19.12.2022	42.5	16.42	6.88	10.94	0.25	<20.0	<10.0
23	23.12.2022	41.44	14.48	5.84	9.93	0.45	<20.0	<10.0
24	26.12.2022	41.47	16.3	6.8	9.9	0.23	<20.0	<10.0
Min		38.71	14.48	5.84	9.9	0.21	<20.0	<10.0
Max		52.81	24.32	9.83	14.94	0.68	<20.0	<10.0
Avg.		43.93	18.63	7.91	11.73	0.40	<20.0	<10.0
P 98		50.78	23.46	9.82	14.48	0.66	<20.0	<10.0
NAAQS, For 24 hourly monitoring (except CO for Eight hour)		100 µg/m³	60 µg/m³	80 µg/m³	80 µg/m³	2 mg/m³	400 µg/m³	180 µg/m³

CHECKED BY

AUTHORIZED SIGNATORY

NOIDA TESTING LABORATORIES

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☎ +91-9313611642, 8510081921, 7503031145, 8527870572, 7503031146, 9999794369

TEST CERTIFICATE

Test Report of	Report Code	Date of Issue
Ambient Noise	AN-061022-09	06/01/2023

Issued To: M/s Lakhwinder Singh Stone Crusher and Screening (Unit - 1)

Project Name: Sh. Lakhwinder Singh S/o Sh. Jagmail Singh

Location: Khasra Nos. 1165, 1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227 measuring 7-21-35 ha. (Private Land/Hill Slope) falling in Mauza Kutharbeet, Mohal Jorrian Kutharbeet, Tehsil Haroli, Distt. Una, H.P.

SAMPLING & ANALYSIS DATA

Sample Drawn By : NTL Representative
Sample description : Ambient Noise
Sampling Time : 24 hrs
Sampling Instrument Used : Digital Noise Meter
Weather Condition : Normal
Monitoring Period : Oct 2022 - Dec 2022

S. No.	Locations	Date of Monitoring	Results		Units
			Day	Night	
1.	Project Site	08.10.2022	58.2	46.2	dB(A)
2.	Pubowal	24.10.2022	52.6	40.8	dB(A)
3.	Gram Panchayat Baliwal	05.10.2022	50.4	38.6	dB(A)
4.	Haroli	04.11.2022	54.1	42.0	dB(A)
5.	Govt. Primary School Kuthar Beet	18.11.2022	47.2	34.6	dB(A)
6.	Polian Beet	23.11.2022	48.4	36.2	dB(A)
7.	Govt. School Badhera	01.12.2022	45.6	32.1	dB(A)
8.	PWD Guest House Haroli	14.12.2022	46.7	38.0	dB(A)

Requirement (as per CPCB Guidelines Limits in dB (A) Leq

Category of Area/ Zone	Day Time	Night Time
Industrial Area	75	70
Residential Area	55	45
Commercial Area	65	55
Silence Zone	50	40

Notes: -

1. The results given above are related to the tested sample, as received & mentioned parameters. The customer asked for the above tests only.
2. Responsibility of the Laboratory is limited to the invoiced amount only.
3. This test report will not be generated again, either wholly or in part, without prior written permission of the laboratory.
4. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.

Ajali
CHECKED BY

AUTHORIZED SIGNATORY

ANNEXURE XI

भारतीय गैर न्यायिक

पचास रुपये

रु.50

भारत

FIFTY RUPEES

Rs.50

INDIA

INDIA NON JUDICIAL

हिमाचल प्रदेश HIMACHAL PRADESH

A 925202

AFFIDAVIT

We, Tilak Raj, Avtar Singh S/os Hakam Singh S/o Sh. Ami Chand & Sh. Chaudhary Ram S/o Sh. Parshotam Singh S/o Sh. Ami Chand all r/o Mohal & Mauza Kuthar Beet, Sub-Teh Dulehar, Distt Una. H.P. Do hereby solemnly affirm and declare as under:-

1. That We are the owner (co-share) of land comprised in khasre No. 1165, 1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226, 1227 Kitta 13 measuring 7-21-35 Hect. Situated in Mohal Jorian Mauza Kuthar Beet, Sub-Teh Dulehar, Distt Una H.P.

2. That We have given consent in favour of Sh. Lakhwinder Singh s/o Sh. Jagmail Singh, R/o Flat No; 824, HIG. Phase-2, Mohali (Punjab) to extract material (sand, Stone and Bajari) from my/our above stated land for a period of **20 years**, and mining lease could be granted by the Department of Industry on this land.

3. That I/we shall charge a sum of Rs. 1,00,000/-per year form Sh. Lakhwinder Singh s/o Sh. Jagmail Singh, R/o Flat No; 824, HIG. Phase-2, Mohali (Punjab). On account of malkana for the above said land.

4. That the expiry of 20 years I/we shall settle fresh malkana which shall be agreeable to both the parties.

5. That in the event of withdrawing from consent before 20 years. We shall responsible for the damage suffered by Sh. Lakhwinder Singh s/o Sh. Jagmail Singh, R/o Flat No; 824, HIG. Phase-2, Mohali (Punjab).

उप-प्रधान
ग्राम पंचायत कुठार बीत
विकास खण्ड हरोली,
जिला ऊना (हि.प्र.)

Attested

Executive Magistrate

6. That the above said statement is true and correct to the best of my knowledge and belief.

Dated:-24-8-2017

Deponent(s)

तिलक राज सिंह चौहरी राम

VERIFICATION:-

I/We Further do hereby solemnly affirm and declare that the contents of this affidavit is true and correct to the best of our knowledge and belief and nothing has been concealed therein.

Dated:-24-8-2017

Deponent(s)

तिलक राज सिंह चौहरी राम

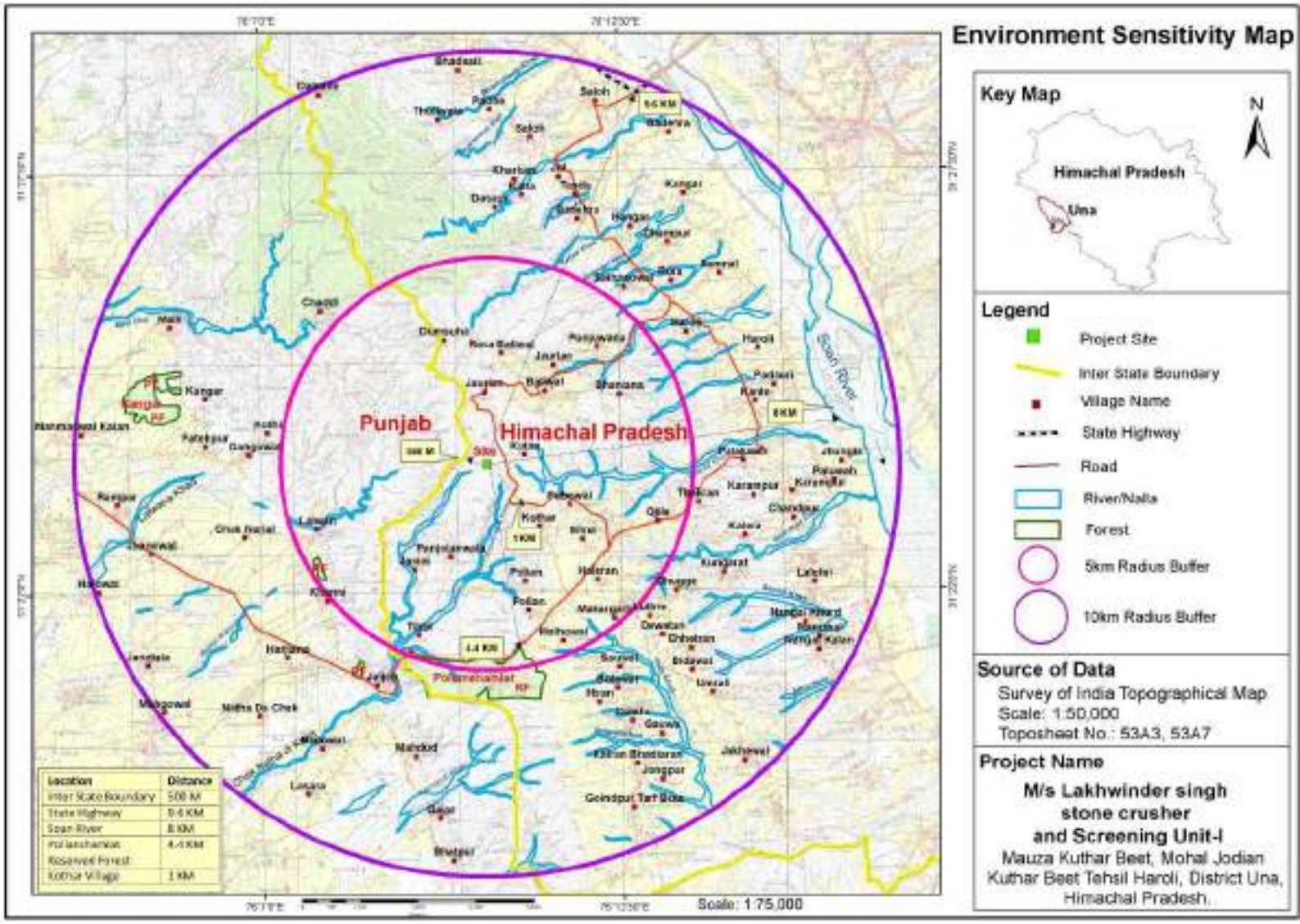
No. 285/RT
28/08/2017

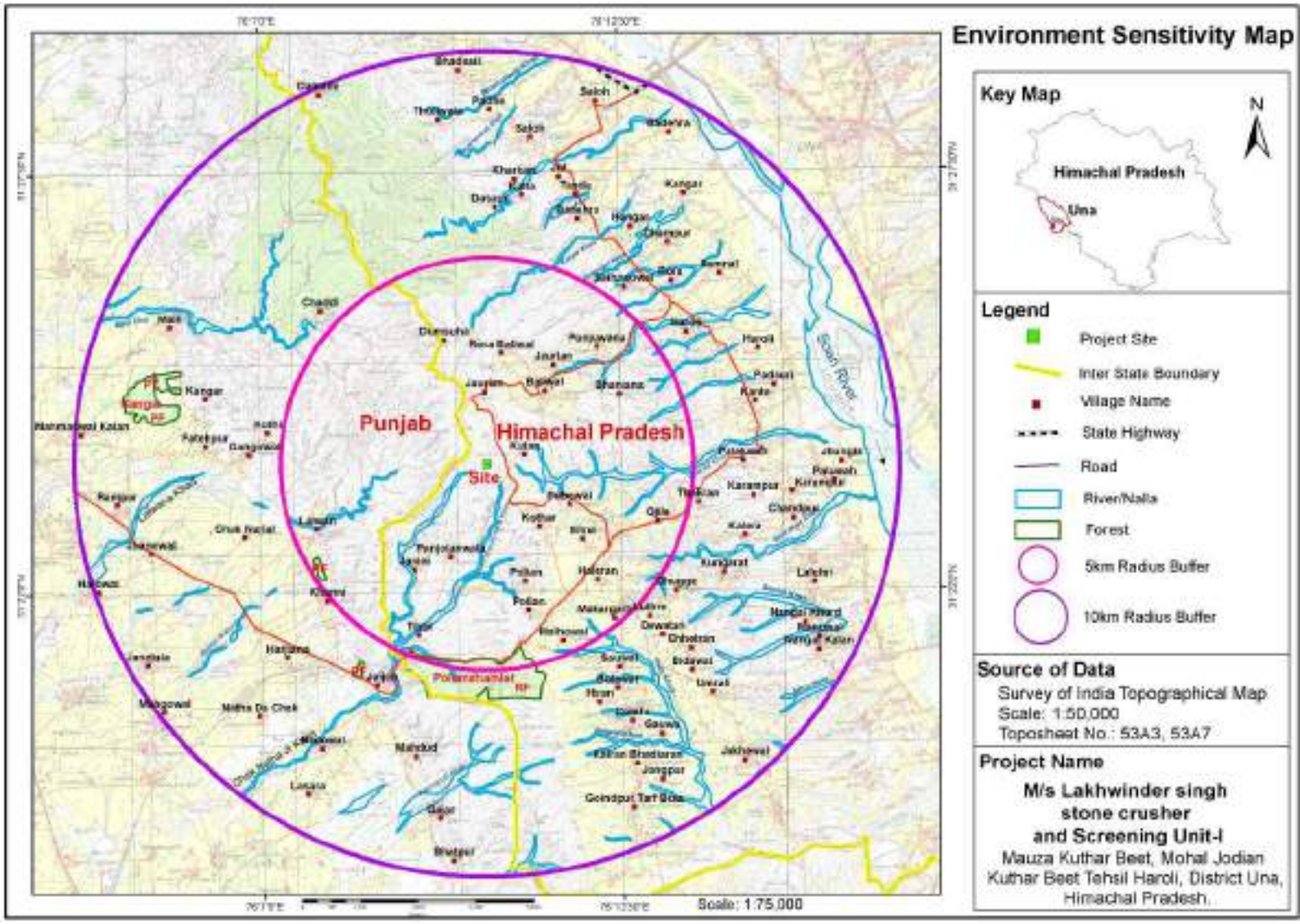
उप-प्रधान
ग्राम पंचायत कुठार बीत
विकास खण्ड हरोली,
जिला ऊना (हि.प्र.)

Executive Magistrate
Harol, Distt. Una (H.P.)

Attested

Executive Magistrate
Harol, Distt. Una (H.P.)


Environment Sensitivity Map
Key Map
N
Himachal Pradesh
Una
Legend
Project Site
Inter State Boundary
Village Name
State Highway
Road
River/Nalla
Forest
5km Radius Buffer
10km Radius Buffer
Source of Data
Survey of India Topographical Map
Scale: 1:50,000
Toposheet No.: 53A3, 53A7
Project Name
M/s Lakhwinder singh
stone crusher
and Screening Unit-I
Mauza Kuthar Beet, Mohal Jodian
Kuthar Beet Tehsil Haroli, District Una,
Himachal Pradesh.
Punjab
Himachal Pradesh
Location | Distance
Inter State Boundary | 500 M
State Highway | 0.6 KM
Soan River | 8 KM
Reserved Forest | 4.4 KM
Kuthar Village | 1 KM
Scale: 1:75,000


Environment Sensitivity Map
Key Map
N
Himachal Pradesh
Una
Legend
Project Site
Inter State Boundary
Village Name
State Highway
Road
River/Nalla
Forest
5km Radius Buffer
10km Radius Buffer
Source of Data
Survey of India Topographical Map
Scale: 1:50,000
Toposheet No.: 53A3, 53A7
Project Name
M/s Lakhwinder singh
stone crusher
and Screening Unit-I
Mauza Kuthar Beet, Mohal Jodian
Kuthar Beet Tehsil Haroli, District Una,
Himachal Pradesh.
Punjab
Himachal Pradesh
Site
Scale: 1:75,000

Evacuation Route Map

Key Map

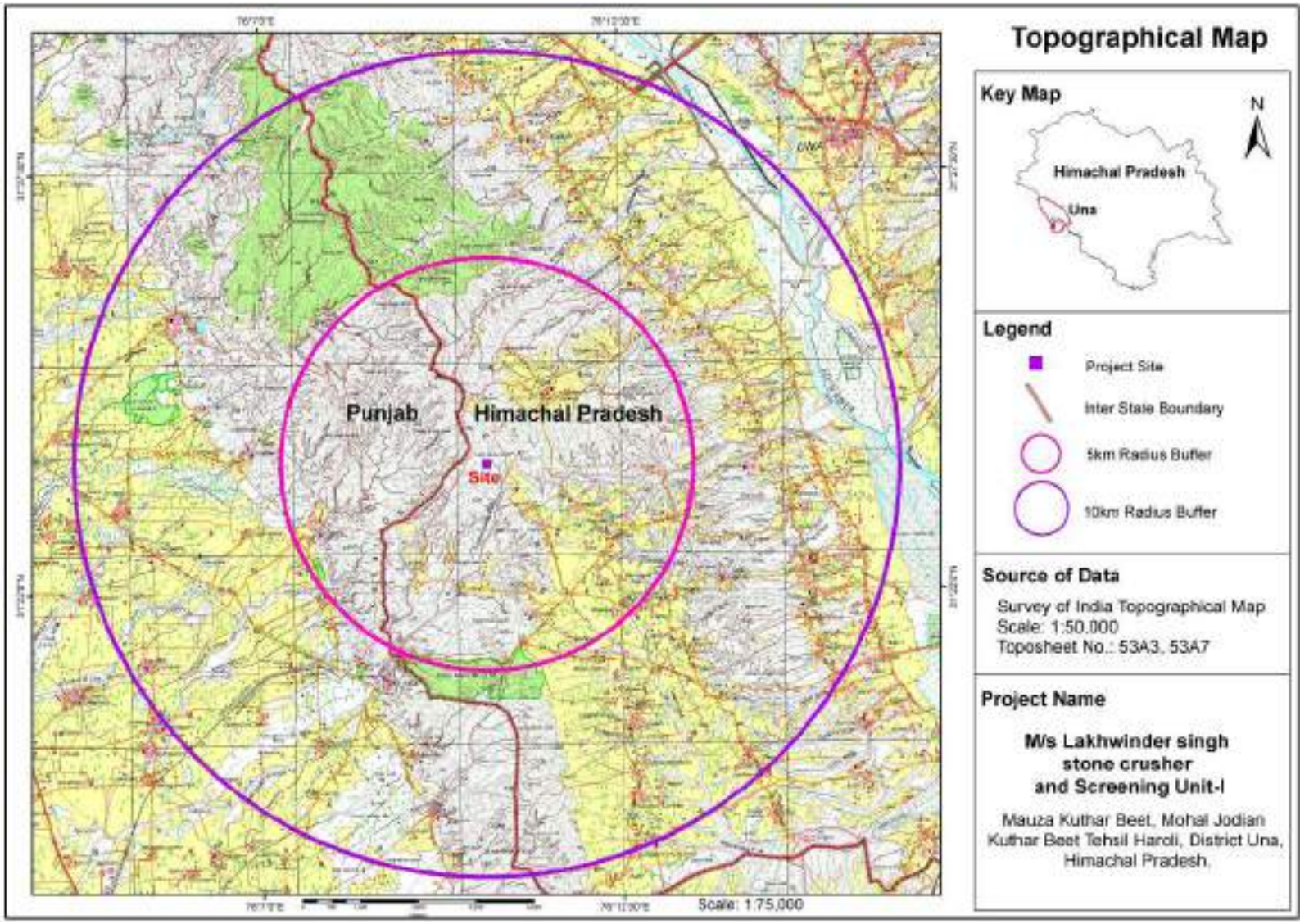
Legend

- Site
- Main Road
- Approch Road
- Metalled Road

Project Name

M/s Lakhwinder singh stone crusher and Screening Unit-I

Mauza Kuthar Beet, Mohal Jodian Kuthar Beet Tehsil Haroli, District Una, Himachal Pradesh.



Topographical Map

Key Map

Legend

- Project Site
- Inter State Boundary
- 5km Radius Buffer
- 10km Radius Buffer

Source of Data

Survey of India Topographical Map
Scale: 1:50,000
Toposheet No.: 53A3, 53A7

Project Name

M/s Lakhwinder singh stone crusher and Screening Unit-I

Mauza Kuthar Beet, Mohal Jodian Kuthar Beet Tehsil Haroli, District Una, Himachal Pradesh.

STUDY ON THE DRAINAGE SYSTEM, MINERAL POTENTIAL AND FEASIBILITY OF MINING IN RIVER/ STREAM BEDS OF DISTRICT UNA, HIMACHAL PRADESH

1 Introduction

There is a common feeling amongst general public that mining activity in river beds creates environmental pollution and damage to the public and private property and to safeguard it, numbers of Petitions are being filed in the court of law for justice. A similar Writ Petition No. 188/2001 was filed in Hon'ble High Court during 2001 titled "Jagjit Singh Dukhiya V/s State of H.P. pointing a very important issue with respect to the mining operation in and upon the river beds of the State of Himachal Pradesh especially vital concern for the safety of the bridge structure. It was further stated in the petition that indiscriminate mining in and upon river beds has been going on unchecked and unregulated causing irreversible depletion as well as hazards and damage to the ecology and environment, including the change of course by the river because of the hazardous, unchecked and totally unregulated mining threatening the safety of bridges and other structures. The Hon'ble High Court of Himachal Pradesh while passing the order on 16-12-2002 in the said. Petition directed the State Government to constitute an appropriate Committee of the Officers and experts of the State Government to formulate the mining policy. The Govt. vide Notification Dated 16-1-2004 constituted a Committee under the Chairmanship of A.C.S. -cum -Secretary Industries to the Govt. of Himachal Pradesh including members from other Departments to formulate Policy and Guidelines for regulation and control of mining operation in and upon the rivers/streams/khallas. Accordingly, River/Stream Bed Mining Policy Guidelines for the State of H.P.-2004 was framed and notified vide notification No. Ind.-II(E)2-1/2001 dated 28-2-2004 (published on 20-3-2004 in extra ordinary Gazette) incorporating guidelines to protect environment and maintain ecological balance, support an appropriate environment friendly utilization of mineral resources of the River/Stream, their proper replenishment and protection of private and Government property with following Principals and Objectives:-

1. 1 Principals:-

- River/natural resources must be utilized for the benefit of the present and future generation.
- It is the responsibility of all sectors to maintain the river resources of the State and to ensure that it is prudently managed and developed
- Awareness is essential to ensure the protection of natural resources of river and their proper utilization and conservation

1.2 Objectives:-

To ensure:-

- scientific and systematic mining
- conservation of minerals
- protection of environment and ecology
- proper replenishment of river beds
- proper protection of river banks
- protection of soil erosion
- protection of bridges and other structures of public utility and
- checking of illegal mining

In the said policy guidelines, it was provided that District level river/stream bed mining action plan shall be prepared according to 9.2 Strategy 2. The action plan shall be based on a survey document of the existing river/stream bed mining in each district and also to assess its direct and indirect benefits and identification of the potential threats to the individual rivers/streams in the State.

This survey shall be conducted by Geological Wing, Department of Industries, Himachal Pradesh and shall contain:-

a) District wise detail of Rivers/Streams/Nallas; and
b) District wise details of existing mining leases/ contracts in river/stream/khalla beds

Based on this survey, the action plan shall divide the rivers/streams of the State into the following two categories;-

a) Rivers/ Streams or the River/Stream sections selected for extraction of minor minerals
b) Rivers/ Streams or the River/Stream sections prohibited for extraction of minor minerals

1.3 Based on the action plan as mentioned above, mining leases/ contracts shall be granted in accordance to the Himachal Pradesh Minor Mineral (Concession) Revised Rules, 1971 and observing the Policy Guidlines. Accordingly, the survey report of the river beds/ parts of river beds of District Una has been prepared based on the field surveys conducted in the past and revisited again from 21st November, 2010 to 23th November, 2010. The rivers/streams were studied based on the following parameters :-

a) Geomorphological studies

i) Place of origin
ii) Catchment area
iii) General profile of river stream
iv) Annual deposition factor
v) Replenishment
vi) Total potential of minor mineral in the river bed

b) **Geological Studies**

i) Lithology of catchment area
ii) Tectonics and structural behavior of rocks

c) **Climatic parameters**

I) Intensity of rainfall
II) Climate zone
III) Temperature variation

1.4 In addition following are the important guiding Geo morphological features of rivers considered while recommending the river/ stream bed for collection of minor minerals:-

- A stable river is able to constantly transport the flow of sediments produced by water shed such that its dimensions (width and depth) pattern and vertical profile are maintained without aggrading (building up) or degrading (scouring down)
- The amount of boulders, cobbles, pebbles, and sand deposited in river bed equals to the amount delivered to the river from catchment area and from bank erosion minus amount transported downstream each year.
- It is compulsive nature for river to meander in their beds and therefore they will have to be provided with adequate corridor for meandering without let or hinderance. Any attempt to diminish the width of the corridor (Floodway) and curb their freedom to meander would prove counter productive
- Erosion and deposition is law of nature. The river/stream has to complete its geomorphological cycles from youth, mature to old age.
- River capturing is unavoidable.
- Fundamentally the lowest point of any stream is fixed by sea level

2. Overview of Mining Lease in the District Una

The three types of minor mineral constituents such as sand stone and bajri are required for any type of construction apart from other material like cement and steel. In earlier times, the houses/ buildings were constructed in form of small dwellings with walls made up of mud plaster, stone and interlocking provided with wooden frames and there were negligible commercial as well as developmental activities resulting less demand of building material. However with the passage of time when the District was carved out during 1972, new vistas of developmental activities were started and as such the demand of minor minerals in the District started an increasing trend. The increase could be gauged from the fact that during 1993-94, the royalty receipt from minerals was merely 5.67 Lakhs which has now been increased to 221.45 lakhs during the year 2010-2011. The quantity of minor mineral consumption is a thermometer to assess the quantity of developmental activities being undertaken in a particular area.

In order to meet the requirement of raw material for construction, the extraction of sand, stone and bajri is being carried out exclusively from the river beds. The demand of sand is mainly met through by river borne sand whereas the demand of bajri/grit is either met through river borne collection or through manufactured grit by stone crushers. The demand of dressed or undressed stone is met through the broken rock material from the hill slope.

In Una District minor mineral such as sand, stone and bajri are available in plenty in various river/stream beds. However in some of the streams like Hum Khad, Palkhwa, Bathri etc. white quartzite boulders are also available in small proportion. These white quartzite boulders are segregated during mining operation and are pulverized for manufacture of white quartzite powder used for glass industry. The quartzites boulders available in the river/stream beds are white, spotted white, greenish white, blackish grey, pink, purple to greyish green. Quartzite fragments are rounded, sub-rounded and discoidal in shape having smooth surface. Their size varies from gravel to boulder. During the monsoons, these beds are replenished to a very large extent from the Siwalik rocks due to erosion by heavy flows.

The result of chemical analysis is tabulated as below in following Table.

Table No. 1: Showing Chemical analysis of Silica Boulders of the Una District

Constituent	**Pure white boulders**	**Spotted white boulders**	**Greenish boulders**
SiO_2	98.035 %	98.053 %	97.678 %
Al_2O_3	1.386 %	1.274 %	1.50 %
Fe_2O_3	0.110%	0.133 %	0.21 %
TiO_2	nil	nil	nil
CaO	0.1 %	0.135 %	0.17 %
MgO	0.056 %	0.056%	0.109 %
Loss of Ignition	0.0286 %	0.319%	0.306 %

The average % age of each grade in the river bed is as under:-

White	8.97 %
Spotted white	3.39 %
Greenish white	4.13 %

Photograph No. : `Silica Boulders of Hum Khad, District Una

The local residents used to lift gravel etc. from the river beds to meet out their bonafide requirement of construction material, however after coming into being the Himachal Pradesh Minor Mineral Concession (Revised) Rules, 1971, the mining was allowed in accordace to the rules. Presently in this District two types of mineral concessions are being granted:-

1) Through grant of mining Lease
2) Through auction

3. At present 47 Nos of mining leases have been granted under Himachal Pradesh Minor Minerals (Concession) and minerals (prevension of illegal mining , storage and Transportation), Rules, 2015 . The detail is tabulated below.

3.0 The List of Mining Leases in the District with location, area and period of validity

Table-2 Showing List of Mining leases in District Una

Sr.No.	Name & Address of the Mining Lease	Mauza / Mohal	Khasra No.	Area	River Bed/ Hill Slope	Period of mining lease with date	Purpose of Lease free sale /stone crusher	Status (working/non-working), if non-working reason
SUB DIVISION HAROLI								
1	M/s Himachal Chemicals & Silicate Works Vpo. Bathu Teh. Haroli District Una (H.P.)	Bathu	1040,1004,1005,853,878,877,1189,1190,1191,1192,1193,1194,1181,1182,1144,1145,1146,1147,1148,1001,847,1032,1032,1034,1034/1,1035/1,1035/2,1035/3,1036,1037/1,1037/2	08-25-60 Hect.	River Bed	25-07-2005 to 24-07-2025	Stone Crusher	Working
2	----Do---	Bathu	949,950,3131/2,3134,3135,3719,3824,3822	27-80-16 Hect.	River Bed	27-07-2005 to 26-07-2025	Stone Crusher	Working
3	----Do---	Singha	1359,2785,2786,2817,to 2828,3046,3047,3050,3054, 3055,3056,3057,3064,3065	20-73-60 Hect.	River Bed	27-00-1996 to 26-11-2016	Stone Crusher	Working
4	----Do---	Bathri	79/2,81/2,82/2,83/1	7-42 Hect.	River Bed	27-11-1996 to 26-11-2016	Stone Crusher	Working
5	M/s Himachal Chemicals & Silicate works Unit-II, Vpo Bathu Tehsil Haroli District Una (H.P.), Unit-II)	Bathri	1115/1	01-07-91 hect.	Hill Slope	11-05-2011 to 10-05-2021	Stone Crusher	Working
6	M/s Him Chemicals & Allied Industries Vpo Bathu,Tehsil Haroli Distt. Una (H.P.)	Bathri	952	0-99-39 Hect.	Hill Slope	19-01-2011 to 18-01-2021	Stone Crusher	Working

SUB DIVISION HAROLI								
7	**Lakhwinder Singh Stone Crusher Vpo Pollian Tehsil Haroli District Una(H.P.), Unit-I)**	**Pollian Beet/ Janani**	**1381,1377,1376,1370,1367,1364,1363,1362,1361,1359,1358,1357,1356,1349,1348,1346,1345,1343,1342,1341,1340/1,1339,1338,1336,1335,1334,1332,1321,1241,1239,1238,1237,1235,1234,1232/1,1231,1217,1215,1213,1211,1210,1208,1207,1203,1202,1198,1195/1,1194,1191,1190,1188,& 1108**	**04-94-12 Hect.**	**Hill Slope**	**07-11-2008 to 06-11-2023**	**Stone Crusher**	**Not Working (EIA)**
8	**M/s Lakhwinder Singh Stone Crusher Vpo Pollian Tehsil Haroli District Una (H.P.) Unit-I)**	**Kuthar Beet**	**1063,1064,1065,1066,1067,1069,1070,1071,1072,1073,1074,1075,1076,1077,1078,1079,1080,1081,1083,1084,1086,1088,1107,1112,1113,1115,11116,1118,1124,1125,1145,1147,1148/1,1149,1152,1155,1159,1159/1,1160,1161,1162,1163,1164,1165,1212,1213,& 1214**	**7-24-93 Hect.**	**Hill Slope**	**08-04-2015 to 07-04-2030**	**Stone Crusher**	**Working**
9.	**M/s Lakhwinder Singh Stone Crusher Vpo Kungrat Tehsil Haroli**	**Kungrat**	**3115,3118,3119,3120,3123,3125,3126,3128,3129,3131,3132,3137,3138,3127,3131/1**	**13-57-15 Hect.**	**Hil Slope**	**18-08-2016 to 17-08-2031**	**Stone Crusher**	**Working**
10	**M/s Lakhwinder Singh Stone Crusher Vpo Kungrat,Tehsil Haroli District Una (H.P.) Unit-II**	**Kungrat**	**546,547,548,7 549**	**4-17-79 Hect.**	**Hill Slope**	**18-11-2011 to 17-11-2026**	**Stone Crusher**	**Working**
11	**M/s Mohantan Mining & Manufacturing Co.Pvt. Ltd. Kothi No 518 Sector 8B Chandigrah**	**Bathri**	**303,304& 305**	**8-98-35 Hect.**	**River Bed**	**25-10-2008 to 24-10-2028**	**Stone Crusher**	**Working**

SUB DIVISION HAROLI								
12	Sh Ramesh Chand Prop: M/s Shiv Shakti Stone Crusher Vpo Singha (Soor Kallan), Tehsil Haroli District Una (H.P.)	Singha/ Soorkalan	3652,3654,3670,3673,3671,3677,3679,3669,3680	4-33-39	Hill Slope	13-03-2014 to 12-03-2029	Stone Crusher	Crush Insta
13	M/s Jai Shankar Stone Crusher Vpo Chandpur,Tehsil Haroli District Una (H.P)	Chanpur	12/2	2-76-30	Hill Slope	04-08-2015 to 03-08-2020	Stone Crusher	Wor
14	M/s Sai Stone Crusher Vpo Bhadiaran PO Dulehar, Tehsil Haroli District Una (H.P.)	Bhadiyaran	300,301,302/2306	4-39-37	Hill Slope	18-01-2016 to 17-01-2031	Stone Crusher	Crush Insta
15	Jagdambay Stone Crusher & Screening Plant Vpo Gondpur Jaichand Nichla Tehsil Haroli District Una	Singa	4083/1460	2-75-53	River Bed	07-04-2016 to 06-04-2031	Stone Crusher	Crush Insta
16	M/s Aar Ess Grit Vpo Kuthar Beet, Tehsil Haroli District Una (H.P.)	Kuthar Beet/Jodian Kuthar beet	3,1478,1479	4-55-60	Hill Slope	15-03-2012 to 14-03-2017	Stone Crusher	Wor
17	Sh. Satbeer Singh S/o Sh Bikram Singh Village & PO Bhaduri Tehsil Haroli District Una (H.P.)	Bhaduri	1803 & 1804	3-52-37	River Bed	05-06-2015 to 04-06-2020	Open Sale	Wor
18	Sh. Mohan Lal S/o Sh Gurbachan Lal Village & PO Bathu Tehsil Haroli District Una (H.P.)	Bathu/ Gurpalah	1435/2,1452/2,1451/2,1450/2,1448/2,1447/2 & 1449	1-98-97	River Bed	03-05-2016 to 02-05-2021	Open Sale	Wor
19	Sh Sanjeev Thakur S/o Sh Kaman Singh Thakur Village & PO Mohalla Gopal naga	Sainsowal	2947/2824/1,2947/2824/2,2947/2824/3,2947/2824/42947/2824/5	3-38-90	River Bed	29-04-2016 to 28-04-2021	Open Sale	Wor
20	M/s AAR ESS Grits Stone Crusher Village & PO Kuthar Beet Tehsil Haroli District Una	Gondpur Bulla Uperla	1200/1	04-45-08	Hill Slope	06-07-2016 to 05-07-2031	Stone Crusher	Crush Insta
21.	Ajay Sharma S/o Sh Prem Chand Sharma ward No.1 village Kalehra PO. Kungrat Tehsil Haroli Distt.Una (H.P.)	Khanpur	1930/2,1929/2,1928/2	3-12-51 Hect. Pvt. Land	Rever Bed	29-09-2016 to 19-09-2021	Open Sale	Wor
22	Rajan Kumar Son Sh Ved Prakash Vpo Saloh Tehsil & Distt.Una	Bela Bathri	1675,1676,1680,1681,1686	3-36-41 Hect. Pvt. Land	River Bed	15-10-2016 to 14-10-2021	Open Sale	Wor

SUB DIVISION AMB								
1	M/s Jaswal Stone Crusher Vpo Mandwara Tehsil Amb Distt.Una	Mandwara	1801	2-42-70 Hect.	River Bed	03-06-2009 to 02-06-2024	Stone Crusher	Wo
2	M/s Mahesh Stone Crusher Vpo Karluhi, Tehsil Amb District Una (H.P.)	Andora Nichla	2074/1 & 2228/1	06-52-21 Hect.	River Bed	19-04-2016 to 18-04-2021	Stone Crusher	Wo
3	Sh. Satish Kumar S/o Sh Prakash Chand Prop M/s HSD Stone Crusher Vpo Dhusara, Tehsil Amb District Una(H.P.)	Takarla Shivnagar	1161&162	16-09-45 Hect.	River Bed	06-04-2015 to 05-04-2030	Stone Crusher	Wo
4	M/s Mahaveer Stone Crusher Vpo Takarla, Tehsil Amb District Una(H.P.)	Takarla Shivnagar	1214,1215,1216,1217,& 1166	9-33-09 Hect.	River Bed	27-01-2015 to 26-01-2020	Stone Crusher	Wo
5	M/s Bharat Stone Crusher & Screening Plant Vpo,Mawa Sindhian, Tehsil Amb District Una (H.P.)	Mawa Sindhiyan	2358,2359	7-24-63 Hect.	River Bed	03-06-2014 to 02-06-2019	Stone Cruher	Wo
6	M/s Rudra Stone Crusher Vpo Oel Tehsil Amb District Una (H.P.)	Oel	1749,1751 & 1763	4-87-72 Hect.	River Bed	25-01-2016 to 24-04-2021	Stone Crusher	Worl
7	M/s Rudra Stone Crusher Vpo, Oel ,Tehsil Amb District Una (H.P.)	Loharli	8/2 & 9	2-95-63 Hect.	River Bed	01-06-2016 to 31-05-2026	Stone Crusher	Wo
8	Sh Satpal & Sachin Prop: M/s Jai Ganesh Stone Crusher Vpo Karluhi Tehsil Amb District Una (H.P.)	Kalroohi	509,510,511,512,513,731	4-39-29 Hect.	River Bed	17-07-2009 to 16-07-2024	Stone Crusher	Wo
9	M/s Athrav Stone Crusher Village Tatehra PO. Oel, Tehsil Amb District Una (H.P.)	Oel	2356,2357,2358,2359, &2365	4-79-80 Hect.	River Bed	30-06-2015 to 29-06-2030	Stone Crusher	Wo
10	Sh.Arun Kumar & Sh Naresh Kumar Partners M/s Krishna Stone Crusher Village Tatehra PO.Oel, Tehsil Amb District Una (H.P.)	Tatehra	4008/1672,4009/1672,4010/1752,4011/1752	03-05-43 Hect.	River Bed	25-04-2015 to 24-04-2020	Stone Crusher	Wo
11	Nand Kishore S/o Late Sh Ved Brat Vpo Guglehar Tehsil Amb District Una (H.P.)	Piplu	2190,2187,2189,2191	0-81-31 Hect.	River Bed	08-06-2016 to 07-06-2021	Open Sale	Wo

12	Sh Rajinder Thakur Prop: M/s Thakur Enterprises Unit-II Vpo Kuthyari Tehsil Amb District Una (H.P.)	Kuthera Jaswalan Nichla	4346/3987/2,4347/3987/2,4348/3987/2	02-43-18 Hect.	River Bed	27-07-2016 to 26-07-2021	Stone Crusher	Wo

SUB DIVISION BANGANA								
1	M/s Thakur Enterprises Vpo Barrian PO. Chowkiminar, Tehsil Bangana District Una (H.P.)	Chowkiminar/ Baduhi	967,969	9-35-30 Hect.	River Bed	07-06-2015 to 06-06-2020	Stone Crusher	

SUB DIVISION UNA								
1	M/s Shiva Stone Crusher Vpo Dhamandri Tehsil & District Una (H.P.)	Dhamandri	3696/3330,3709/3590,3391,3695/33330	01-16-96 Hect.	River Bed	29-06-2011	Stone Crusher	
2	Smt Ambika D/o Sh Prem Chand Vivek Nagar Pir Nigah Road Prop M/s Saraswati Stone Crusher	Chalola Pratham	2846/1236,2843/1234,2845/1236	00-76-38Hect.	Hill Slope	03-11-2011 to 02-11-2016	Stone Crusher	
3	Raman Kumar S/o Sh Ganda Ram R/o Gondpur Bulla Tehsil Haroli District Una	Santoshgrah	270,271,273,274,275,276,277,278,279	2-36-15 Hect.	River Bed	05-06-2015 to 04-06-2020	Open Sale	
4	Sh Raman Kumar S/o Sh DharampalVpo Ispur Tehsil & District Una (H.P.)	Saloh/Ghalluwal	339/2,341/1,339/1,340 & 341/2	3-31-57 Hect.	River Bed	16-02-2016 to 15-02-2021	Open Sale	
5	Sh Sham Kumar S/o Sh Tilak Raj Vpo Ispur Tehsil & District Una (H.P.)	Pandoga	2542,2543,2544,2545,2546,3202, & 3203	3-63-22 Hect.	River Bed	10-06-2015 to 09-06-2021	Open Sale	
6	Sh Som Nath S/o Sh Yog Raj Vpo Upper Basal Tehsil 7 District Una (H.P.)	Upper Basal	1551 & 1533	3-47-69 Hect.	River Bed	30-04-2016 to 29-04-2021	Open Sale	
7	Matri Stone Crusher Partners Sh Ram Dev Duvedi & Kamal Kishore Sharma, Vpo Bhatoli Tehsil Una District Una (H.P.)	Basal/Khaduni	804,805,806,807,808,809	04-75-67 Hect.	River Bed	07-04-2016 to 06-04-2031	Stone Sale	
8	Sh Manjit Singh Prop:Nav Durga Stone Crusher,Village Bangrah PO Kakhera Tehsil Una District Una(H.P.)	Bangarh	3817 7 3821	01-99-88 Hect.	Hill Slope	01-06-2016 to 31-05-2021	Stone Crusher	
9	Sh Ran Vijay S/o Sh Desh Raj Vpo Nangran Tehsil & District Una (H.P.)	Nangran	1960,1961,1962,1971,1972,1976,1978 & 1973	2-84-13 Hect.	River Bed	20-07-2016 to 19-07-2021	Open Sale	
10	Sh Kapil Sharma Prop M/s Shree Shree Rudra Stone Crusher & Screening Plant,Vpo Basal Tehsil Una District Una (H.P.)	Basal	1395,1396,1394/1,1398/1,1402/1,1406/1	02-99-25 Hect.	River Bed	07-04-2016 to 06-04-2031	Stone Crusher	

11	Sh Raman Kumar S/o Sh Dharampal Prop M/s Rudra Crusher Sharma,Vpo Ispur Tehsil Una District Una (H.P.)	Ispur	2561,2562,2563,2564,2569,2570,2571,2572,2573,2574,2575,2576,2566,2567,2568,2577,2578258 0,2581	04-81-31 Hect.	River Bed	26-08-2016 to 25-08-2031	Stone Crusher	
12	Vijay Kumar son Mangat Ram Vpo Charatgrah Tehsil & Distt.Una	Udaypur	1197/2	03-99-79 Hect. Pvt. Land	River Bed	04-11-2016 to 03-11-2021	Open Sale	

3.1 Through Auction

Total Eight blocks of river bed are identified to put into auction for extraction of sand, stone and bajri

Table-3 Showing List Of Auctioned Quarries District Una

Sr. No.	Name of Quarry/River	Khasra No.	Mauza/Muhal	Area in Hect.	Revenue status of Land
1	Nangran (Block I) Swan River	2044,2045,2042,2043,2041,2040,2035,2036,2039,2034,2037,2038,2033,2032,2031,2030	Nangran Jhikla	05-69-16	Gair Mumkin Swan
2	Nangran (Block 2) Swan River	2014,2015,2016,2010,2011,2012,2013,1984,1983,1982,1981,1978,1977,1975,1974	Nangran Jhikla	05-61-74	Gair Mumkin Swan
3	Nangran (Block 3) Swan River	1967,1968,1969,1970,1966,1965,1964,1602,1596,1591,1590,1601,1598,1595	Nangran Jhikla	05-15-34	Gair Mumkin Swan
4	Nangran (Block 4) Swan River`	1600,1599,1594,1593,1587,1561,1562,1586,1579,1563,1564,1585,1580,1578,1565,1566,1567,1573,1572,1570,1569,1568	Nangran Jhikla	10-28-80	Gair Mumkin Swan
5	Nangran (Block 5) Swan River	712,709,708,702,703,704,696,695,694,693,690,691,692,685,683,684,680,661,662	Nangran Jhikla	07-23-42	Gair Mumkin Swan
6	Jankaur (Block 1) Swan River	29	Jankaur	13-21-32	Gair Mumkin Swan
7	Jankaur (Block 2) Swan River	8	Jankaur	05-30-63	Gair Mumkin Swan
8	Jankaur (Block 3) Swan River	9	Jankaur	06-72-04	Gair Mumkin Swan

4.0 Details of Royalty or Revenue received in last three years

Table No.**-4 showing yearwise detail of Royalty of Minor Minerals**

Sr No.	Year	Royalty in lacs

1	2013-2014	4,35,38,205
2	2014-2015	2,77,92,350
3	2015-2016	5,76,67,059

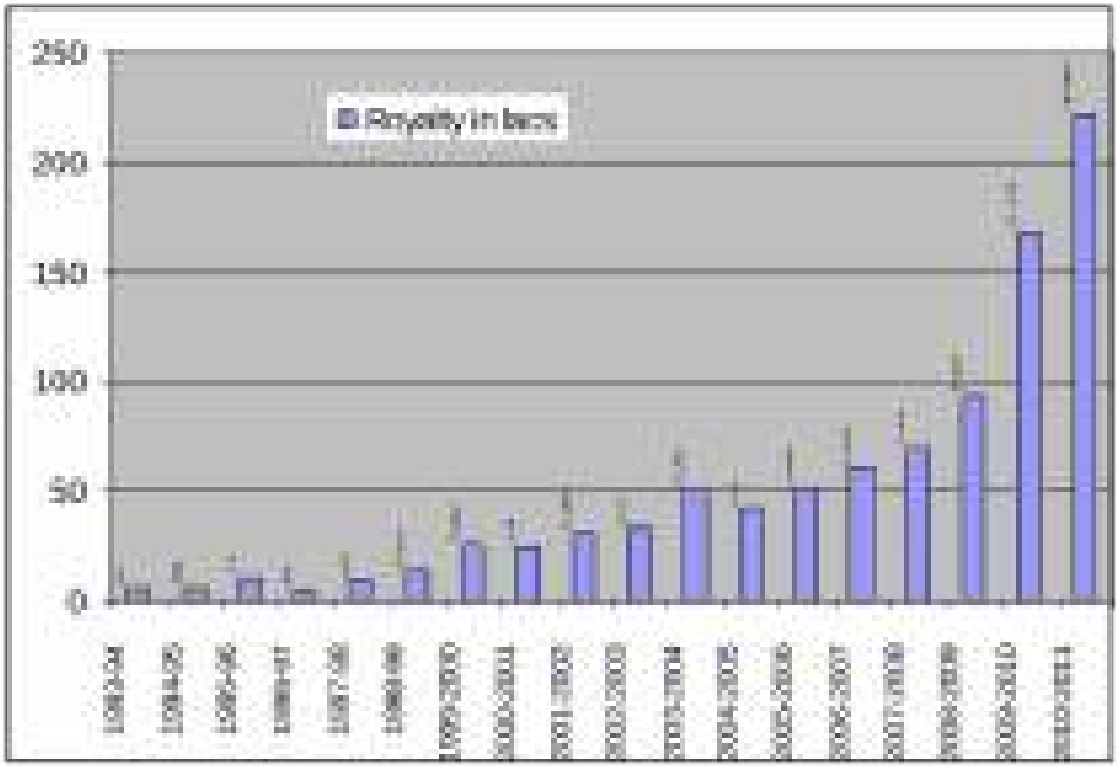
5.0 Detail of Production of Sand or Bajri or Minor Mineral in last three years.

In Una District, minor minerals such as sand stone and bajri are available in plenty and in some rivers/stream beds, white quartzite boulders are also available which are being used in glass industry. The royalty received from the aforesaid minerals since 1993-94 onwards is tabulated in the following table.

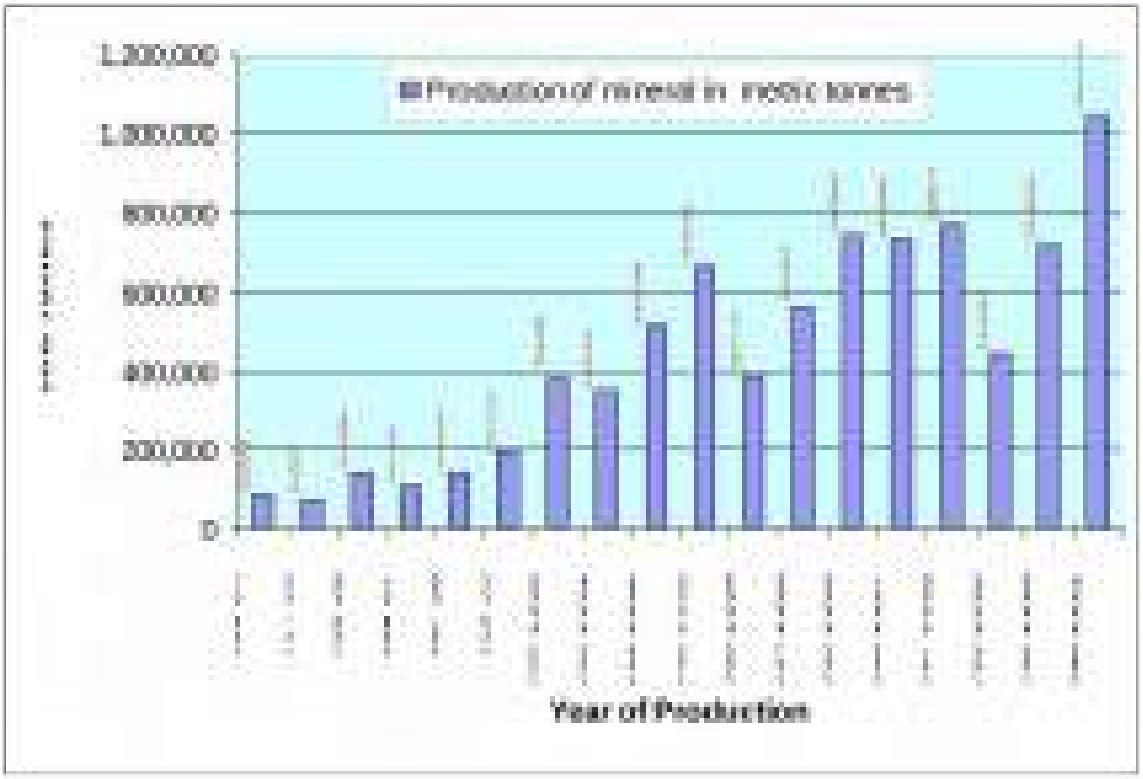
Table No.-5 showing yearwise detail of Royalty and production of Minor Minerals

Sr No.	**Year**	**Production of mineral** in metric tonnes
1.	2013-2014	9,42,887
2.	2014-2015	6,50,790

Graph No. 1 Showing Year wise Revenue Trend of District Una (in Lacs)



Graph No. 2 Showing Year wise Production of Minerals in District Una



6.0 Process of Deposition of Sediments in the rivers of the District

6.1 Deposition is the opposite of erosion. Deposition is where a river lays down or drops the sediments or material that it is carrying. Rivers carry lot of different sediments, including rocks, boulders, silt, mud, pebbles and stones. Normally, a river has the power to carry sediments. If the force of a river drops, the river cannot carry sediment and as such deposits its sediment.

The work done by a river consists of the following

1) Erosion
2) Transport of the material produced by erosion
3) Accumulation (deposition) of the transported material

The erosion and transport of material go hand in hand with the deposition of the latter. There is not a single river that doesn't carry fragmental material and deposit it. Even at the early stages, in the development of a river, when the erosion and transport definitely prevails over accumulation, the material carried by the river is deposited in some of the sections. During youthful stage of the river, these deposits are unstable and when the volume of water and stream velocity increases (during flood), they may start moving again downstream. The load carried by a stream includes the rock waste supplied to it by rain wash, surface creep, slumping etc. by tributaries, external agents such as glaciers, wind, together with, acquired by its own erosion work. The term load doesn't specifically mean the maximum amount of debris, that a stream could carry in a given set of conditions, that amount is referred to as the transporting power or capacity of a river. The term load is technically defined as the total weight of solid detritus transported in unit time. The transporting capacity of a stream rises very rapidly as the discharge and the velocity increases. Experiments show that with debris of mixed shapes and sizes, the maximum load that can be carried is proportional to something between the third and fourth power of the velocity. But the fragments of a given shape, the largest size that can be moved (not the actual mass of mixed debris) is proportional to the sixth power of the velocity, provided of course that the depth of water is also adequate for the purpose. As the velocity of a river is checked, the bed load is first to come to rest with continued slackening of the flow, the larger ingredients of the suspended load are dropped, followed successibly by finer and finer particles. When the stream begins to flow more vigoursly, the finer materials are the first to move again. A river begins to sort out its load or burden as soon as it receives it. The proportion of fine to coarse amongst the deposited materials tend on average to increase downstream, but there may be interruptions of this tendency because of addition of coarse debris from tributataries or from landslides and steepening of the banks.

Both discharge and load depend on the climate and geology (litholgy, structure and relief) of the river basin concerned and both co-operate in carving out the channels down and down

6.2 General Geomorphological Characteristics of Rivers/Streams

Transport of Sediment by Streams and Rivers

The material transported by a stream can travel as:

1. **Bed load**
2. **Suspended load**
3. **Dissolved load** (salts, chemicals)

Stream capacity

- Maximum quantity of solid material that a stream can carry
- Related to velocity (discharge)
- Higher after a rain (more sediment in water)

Stream competence (or competency)

- Measure of the maximum **size** of particles the stream can transport
- Predict erosive capabilities

Type of rivers or streams

1. **Meandering**

These streams are very sinuous, and tend to migrate back and forth across the floodplain (or meander), over time. The word "meander" comes from the name of a sinuous river in Turkey, named the Menderes.

2 Braided

These streams have lots of lenticular-shaped in-channel bars. The stream channel bifurcates around these bars, and follows a pattern resembling braided hair.

Fluvial Geomorphology

Erosion is the set of all processes by which soil and rock are loosened and move downhill or downslope. The most important process of erosion is due to running water. Erosion by running water acts in two basic forms: *overland flow* and *channel flow.*

Splash Erosion

Most running water starts off as rain. Rain drops have diameters between 0.5 to 7 mm and hit the ground at the rate of 1 - 9 m/sec. The force of the impact loosens material and throws it into the air. This is called **splash erosion**. In violent thunderstorms, over 200 tonnes/hectare can be disturbed. On a sloping surface, soil is shifted downhill as grains move slightly greater distances downhill than uphill. More importantly, however, it leads to a decrease in the permeability of the surface due to openings being sealed by particles. There is therefore less infiltration and an increase in overland flow

Overland Flow

Runoff starts as a broad sheet. The sheet exerts a drag force over the ground surface and some weathered products may be removed. This is sheet erosion. Generally, after travelling a short distance, small channels or rills are formed, which coalesce into gullies, concentrating the erosive action.

The amount of erosion of a slope depends on

- the length and steepness of the slope
- the rainfall intensity
- the permeability and structure of the surface
- the amount of vegetation cover.

Channel Flow

Stream erosion is "the progressive removal of mineral matter from the surface of a stream channel which itself may consist of bedrock or regolith. Erosion will only occur when the stream has an excess of energy. In mountainous streams, the rough channel walls may amount to 96% of the potential energy of the stream. Some energy is also spent in transporting load previously acquired. The quantity of water passing through the channel is termed the **discharge** (m^2/sec) and is eqaul to the channel cross-sectional area (m^2) times the average stream velocity (m/sec).

The amount of sediment carried by the stream is called the stream **load** (kg/m^3).

6.3 Sub-processes of Erosion.

a. Hydraulic Action

This is very important in weak alluvial deposits, especially in times of flood, when fast flowing; turbulent water undermines the channel banks.

b. Abrasion,

- the scouring caused by the impact of rock particles that are being transported. Abrasion features include plunge pools, potholes and chutes. Abrasion is proportional to velocity, so a three-fold increase in velocity leads to nine times as much abrasion. The mutual erosion of two particles is known as attrition

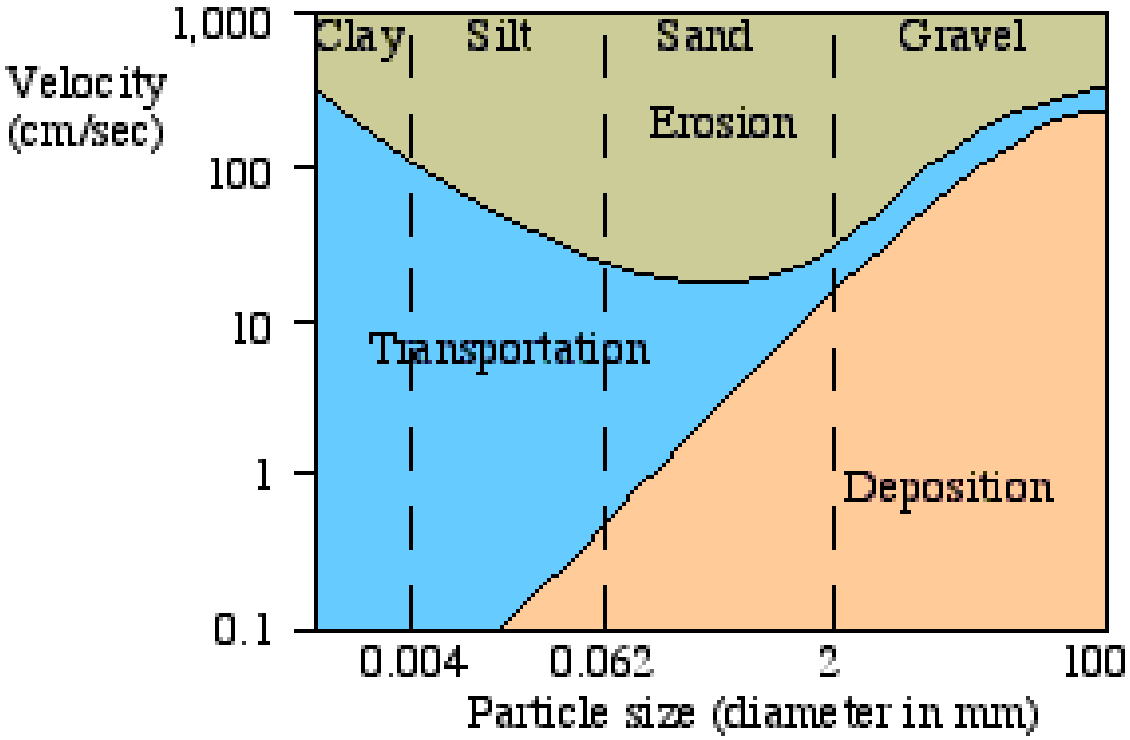
c. Solution (Corrosion)

- chemical reactions between ions in solution and exposed minerals. It is particularly important in limestone areas or on beds of rock salt and gypsum, but all common minerals is soluble to some extent.

6.4 Erosion Velocities

The easiest grains to erode are in the fine to medium sand size range Particles greater than this size have a proportionally greater volume to surface area ratio, so are harder to erode. For clays, ionic bonding leads to increased cohesion between clay particles, making them harder to erode. Clays are also platy minerals and form smooth surfaces. Laminar flow over the smooth surface decreases the ability of the stream to erode the particles. Clays also infill between larger grains and so are protected by the larger grains. Sands, therefore, may be moved during "normal" river flow, but it is only when floods increase the stream's velocity that the larger and smaller particles can be moved. Once the particles are being transported, there is an orderly deposition of particles with the largest being deposited first and clays being held almost indefinitely. Hence the sediment becomes sorted downstream.

Graph No. 3 Showing the stream velocity required to erode, transport and deposit particles of various sizes.



Hjulstrom diagram showing the stream velocity required to erode, transport and deposit particles of various sizes.

6.5 Transportation

The particles carried by streams are known as the **stream load**. Particles may be carried by

- **floatation**. of very minor significance.
- **solution**. Ions of dissolved minerals that may travel downstream indefinitely. The most common are Na, Ca, K, Mg, Cl, SO_4 and HCO_3. One estimate of U.S. rivers was that they carry 300 million tonnes of dissolved load each year, and 250 million tonnes of solid load.
- **suspension**. The temporary support of particles when turbulence is greater than the settling velocity of the particle. Clay and silt are normally transported in suspension, but sand may be carried this way in floods.
- **saltation**. Intermittent "jumping" of grains that are lifted by turbulence, but are too heavy to remain in suspension.
- **traction**. The sliding or rolling of particles along the stream floor. Particles moved in this way comprise the bed load. Bed load normally constitutes around 10% of the solid load, but may be up to 50% during floods, when the major work of the stream is done.

Transportation is aided by the buoyancy of water, eg. quartz grains are Å 2000 times the density of air, but only two and a half times that of water. Unequal velocities at the top and bottom of boulders also assist transportation, as does steep gradients.

The total load of particles of all sizes that a stream can carry is known as its capacity. It is proportional to discharge, which is proportional to velocity. A faster flowing stream therefore has a higher capacity. If a stream's capacity is less than its load, the stream cannot carry its load, so deposition occurs. If capacity exceeds load, the stream has excess energy

(gravitational, potential energy), so it can erode more sediments. Streams switch back and forth from depositional to erosional agents, depending on load vs. capacity. A stream can erode along one stretch and deposit along another, since gradient and channel shape/size vary along the course of stream. Streams can erode during periods of higher velocity or discharge (floods) and deposit during periods of lower velocity or discharge. Anything that alters the sediment load delivered to the channel or that alters the stream's capacity to carry that load will cause the stream's gradient or channel geometry to change in response

The largest particle that a stream can transport is known as its **competence**. Assuming that there is sufficient depth to cover the particles, then competence is proportional to the square of velocity.

6.6 Deposition

Deposition will occur when a loss of energy results in a decrease in velocity. This may be due to such things as declining gradient, a decrease in water volume, an increase in cross-sectional area (particularly pools, lakes, and oceans), or by local obstructions. An excessive load produced by increased erosion in the drainage basin or tributary valleys, or from glaciofluvial outwash will also inevitably lead to deposition. The accumulations of stream deposits are called **alluvium**

Note: There is a constant interaction between erosion, transportation and deposition. During a flood, the bed of a stream at a particular point may be eroded, but as the flood subsides the bed is filled again. Similarly, in different parts of the stream, velocity differs and hence one part of the stream may be eroding its bank, while on the opposite bank deposition is taking place.

7.0 General Profile of Una District

7.1 General

Una is a small foothill district located on South Western border of the State and is situated between 75°58’21’’–76°28’25”east longitude and 31°17’52’’-31°52’0’’ north latitude. It is bounded in the North by Kangra District, in North -East by Hamirpur District, in South- East by Bilaspur District and by Punjab in West and South

The few important fact of the district is given below:-

7.1. a. **Demography:-**

Population 4,47,967 as per 2001 census

	Male	2,24,299	
	Female		2,23,668
	Rural		4,08,545
	Urban		39422
	Literacy Rate		81.09%
7.1.b.	**Area**		1540 sqkm
	Forest area		185 sqkm
	Cultivated area		430 sqkm
	Barren and unculturable land		226.7 sqkm
	Land put to non agriculture use		294 sqkm
	Permanent pastures and other grass lands		129.4 sqkm
	Land under Miscellanceous trees and crops		55.4
	Irrigated area		78.4
7.1.c.	**Administrative set up**		
	No. of sub-divisions	2 (Una and Amb)	
	No. of Tehsils	3 (Una, Amb and Bangana)	
	No.of Sub Tehsils	2 (Haroli and Bharwain)	
	Development Blocks	5(Una, Amb, Gagret,Dhundla(Bangana) and Haroli	
	No. of Panchayats	219	
	Backward Panchayats	3(Ambehra Dheeraj, Plahta, Sihuna all under Bangana Block	
	Villages	866	
	Assembly Segment	5 (Una, Santoshgarh, Gagret, Kutlehar and Chintpurni	

7.2. Location

The Una District lies between 75°58’21’’ –76°28’25”east longitude and 31°17’52’’-31°52’0’’ north latitude and covers following 7 Nos. Survey of India Toposheet:-

1. 44 M/13
2. 44 M/14
3. 53 A/1
4. 53 A/2
5. 53 A/3
6. 53 A/6
7. 53 A/7

The area of district lying on each survey sheet is shown in the following Figure-1

Figure 1. Showing the area of district lying on each Survey of India Toposheet

8.0 Land utilization Pattern in the district: Forest, Agriculture, Horticulture, Mining etc.

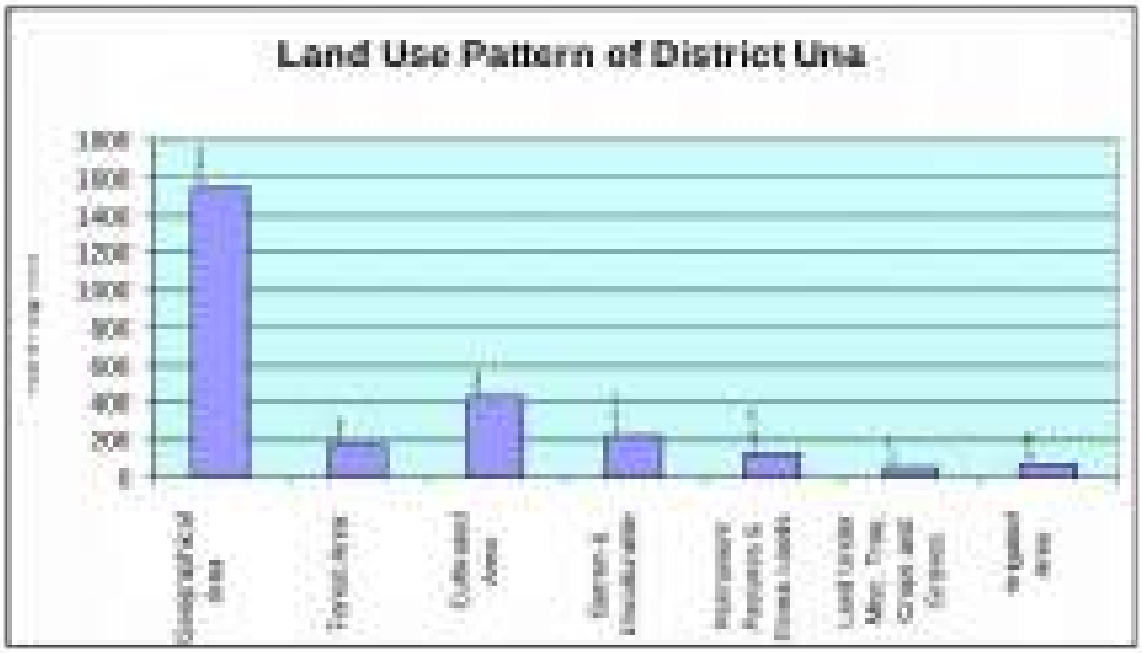
Primarily the land of the district can be classified in following four categories as shown in figure 3

i. Forest
ii. Water bodies
iii. Arable land unirrigated
iv. Urban settlement

Table No.-6 Showing the total land of each category in Sq. Km in Una District.

1	**Geographical Area**	**1540 Sq. Kms**
2	**Forest Area**	**185 Sq.Kms.**
3	**Cultivated Area**	**430 Sq. Kms.**
4	**Barren & Unculturable Lands**	**226.7 Sq. Kms.**
5	**Permanent Pastures & Other Grass Lands**	**129.4 Sq. Kms.**
6	**Land Under Misc. Tree, Crops and Groves**	**55.4 Sq. Kms.**
7	**Irrigated Area**	**78.4 Sq. Kms.**

Graph No. 4 Showing the Land Use Pattern



8.1 AGRICULTURE:-

Most of the area of District Una consists of foot hills and Swan valley up to elevation of 600 metres above mean sea level with sub tropical climate. The soils are mostly sandy loam in texture with scattered loamy patches. The area is highly prone to erosion due to weak geological formations and scanty vegetation. The moisture retention capacity is poor. The crops usually face moisture stress during the remaining period of the year due to inadequate and irregular stress during the remaining period of the year due to inadequate and irregular rainfall. The irrigation facilities are provided by lifting water from steams, shallow dug wells and medium to deep tube wells in the valley area.

The source of water and irrigation in district Una can be classified into following five classes.

1. Lift Irrigation Scheme.
2. Kuhls
3. Well used for domestic purposes
4. Well used for irrigation
5. Tubewells

The main crops grown in the area are Wheat, Maize, Gram, Paddy, Mustard, Sugarcane, Patato, Vegetables, and Citrus etc. The area covered under each crop in the District Una is given below in table 6

Table 7 Showing area covered under each crop in District Una

Crops	Area (Sq.Kms)
Food Crops	**652.24**
1. Rice	**26.8**
2. Maize	**295.8**
3. Wheat	**321**
4. Gram	**2**
5 Green Gram (Moong)	**0.05**
6. Black Gram or Urd (Mash)	**6.2**
7. Peas	**0.03**
8. Horse Gram (Kulth)	**0.25**
9. Masur	**0.11**
Sugarcane	**6.02**
Vegetables	**8.21**
1. Potatoes	**6.13**
2. Peas	**0.23**
3.Onion	**0.7**
4. Tomatoes	**0.07**
5. Cabbage & Cauli Flower	**0.74**
6. Turnip	**0.03**
7. Radish	**0.06**
8. Carrot	**0.04**

9. Brinjal	**0.21**
Condiments & Spices	**0.45**
1. Chillies	**0.09**
2. Ginger	**0.13**
3 Turmeric	**0.07**
4. Garlic	**0.16**
Non-Food Crops	**44.18**
Fibre	**0.17**
1. Hemp	**0.17**
Oil Seeds	**21.92**
2. Groundnut	**0.1**
3. Taramira	**4.66**
4. Seasamum	**7.09**
5. Rape(Toriya) Seeds	**0.06**
6. Mustard	**10.01**
Fodder Crops 18.42	
1. Barseem & Lucrene	**5.42**
2. Chari	**10.98**
3. Bazra	**2.02**

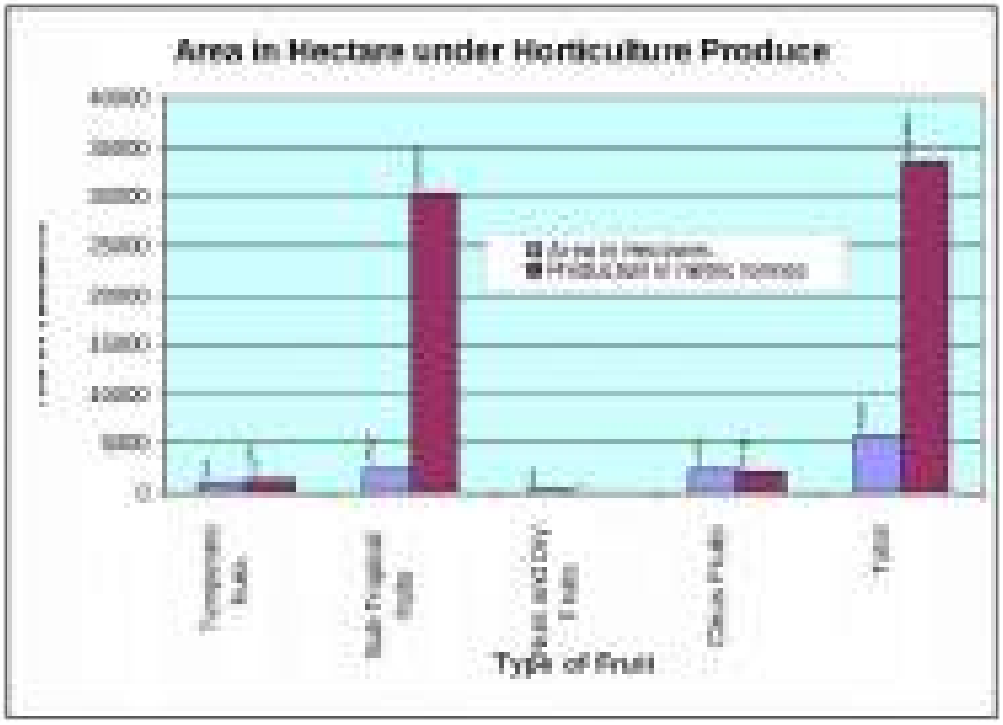
8.2 HORTICULTURE:-

The main horticulture produce of the area can be classified into four categories. The Table- 7 showing area covered under each category and the total production as per 2001-2002 survey.

Table No.- **7 Showing the %age of area in Hectares used for growing the fruits.**

Sr. No.	Type of Fruit	Area in Hectares	Production in metric tonnes
1	Temperate fruits	981	1254
2	Sub-Tropical fruits	2243	30306
3	Nuts and Dry Fruits	192	12
4	Citrus Fruits	2252	1976
5	Total	5668	33548

Graph No. 5 Showing the area of District Una under horticulture produce



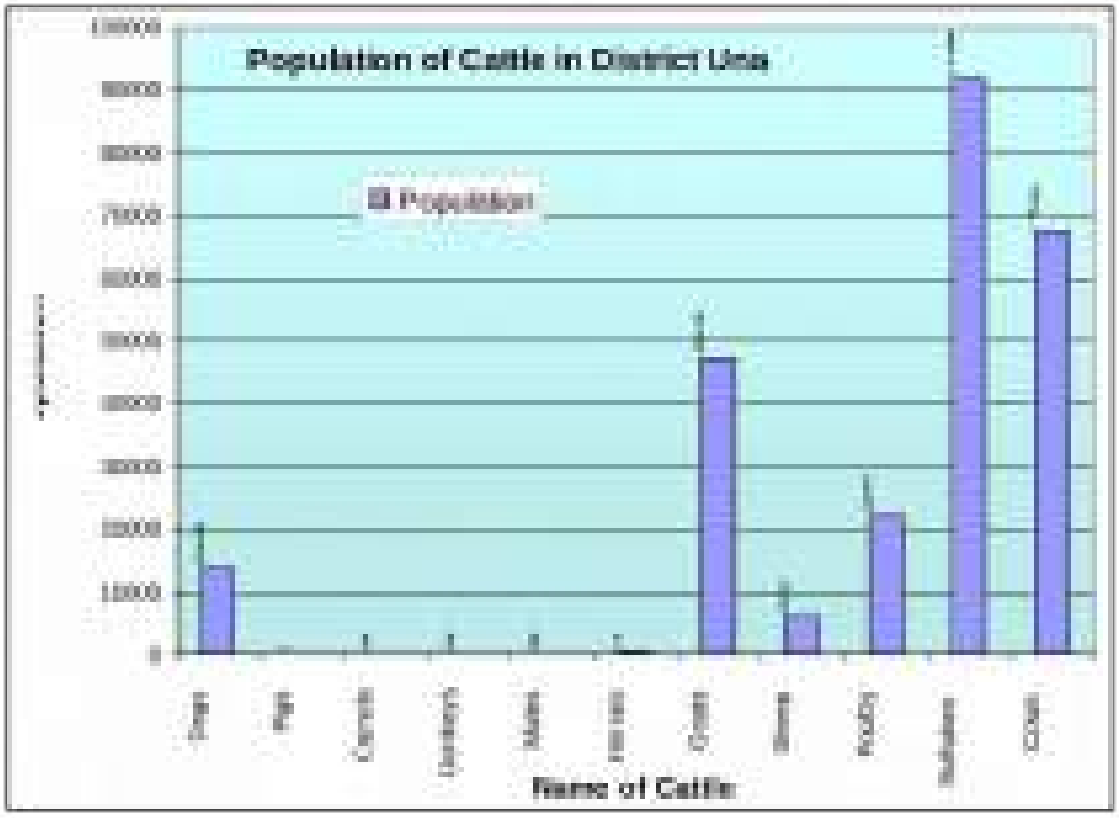
8.3 ANIMAL HUSBANDRY

Economy of the district is predominantly agrarian but role of Animal Husbandry is equally important as the farmers have to keep the cattle for the purpose of ploughing, manure for maintaining fertility of the fields and to meet daily need of milk of their family. The Table- 8, given below is showing the population of cattle in district Una as per 1992 Census.

Table No.**-8 Showing the Population of Cattles in Una District, 1992 census**

Sr. No.	Name of Cattle	Population
1	Dogs	13830
2	Pigs	66
3	Camels	100
4	Donkeys	145
5	Mules	156
6	Horses	367
7	Goats	46976
8	Sheep	5983
9	Poultry	21847
10	Buffaloes	91736
11	Cows	67492

Graph No. 6 Showing the Population of cattles in District Una



8.4 FISHERIES

Una is a foot hill district with arid and scanty rains. In natural fisheries resources this district comprises of a portion of Govindsagar reservoir falling in the district. Lunkar Khad spread from Dumkhar to Bhakra where considerable fish production is achieved.

There are about 130 seasonal and perennial ponds measuring about 65 hectares area in the district, which has been bought under the fish culture through different schemes.

4.8 FLORA

Tree

Khair
Siris
Kachnar
Semal
Tun
Mango
Behul
Shisham
Ritha
Tut

Behera & Chil

Shrubs

Vitex
Munj
Ber
Ipomea
Dodonea &
Bamboo.

Grasses

Vetiver
Sanchrus
Munjh.

4.9 FAUNA

The species of animals and birds commonly found in the district are:-

- Leopard (Bagher)
- Hare
- Wild Bore(Jangli Soor)
- Jackal
- Barking Deer (Kakkar)
- Monkey
- Sambar
- Birds
- Chakor
- Crow
- Red Jungle Fowl (Jangli Murga)
- Black Partridge (Kala Titar)
- Grey Partridge (Safed Titar)
- Woodpecker

9.0 Physiography of the District

In general the area is a part of Siwalik range .The Siwalik Hills are located within the political boundaries of Pakistan, India, Nepal, and Bhutan, and range between 6 to 90 km in width. They gradually become steeper and narrower in relief and width respectively, from northern Pakistan to Bhutan (over 2000 km in length). Ongoing erosion and tectonic activity has greatly affected the topography of the Siwaliks. Their present-day morphology is comprised of hogback ridges, consequent, subsequent, obsequent, and resquent valleys of various orders, gullies, choes (seasonal streams), earth-pillars, rilled earth buttresses of conglomerate formations, semi-circular choe-divides, talus cones, colluvial cones, water-gaps, and choe terraces. Associated badlands features include the lack of vegetation, steep slopes, high drainage density, and rapid erosion rates. To the

Figure-2 : Showing important ranges and water divide in Una District

South of the Siwaliks are the Indo-Gangetic plains and in the north, they are bordered by the Lesser Himalayas.

Intermittently located between the Siwaliks and the Lesser Himalayas (exclusively in India and Nepal) are *duns*, flat-bottomed longitudinal structural valleys with their own drainage systems. These essentially comprise several large Himalayan piedmont alluvial fans and terraces, which formed as a result of tectonic episodes in the flanking Siwaliks. The *duns* also consist of lacustrine, fluvial, aeolian and swamp-environment deposits, and range from Middle Pleistocene to Holocene in age. During their formative stage, most of the *duns* were slightly narrower and have gradually expanded over time through the erosion of the adjacent Siwalik sediments (a continuing process). In Nepal, these *duns* were often naturally filled with alluvial sediments of lacustrine and fluvial deposits, thus burying palaeolithic sites that were later exposed through erosion.

The monsoon rains temporarily supply seasonal streams (locally known as choes, khads, or nalas) located both within the Siwalik hills and the adjacent *duns*. These stream banks and their terraces yield sizeable numbers of lithic artefacts, owing to the shared location for both water and raw material.

The district is bounded by plains of Punjab in the West and Sola Singhi Dhar (Siwalik Range). The ranges trend in general NW-SE direction and between there is a longitudinal valley of the Soan River. The altitude varies from 300 metres to over 1200 metres above MSL on Sola Singhi Dhar. The width of the Jaswan Dun Valley ranges from 7 Kms to 14 Kms and the town of Una, which is nearly in the middle of the Dun valley (Jaswan Valley) is on the elevation of 427 Mts above MSL. In general most of the district lies between 600- 900 mts elevation and slope is less than 10º

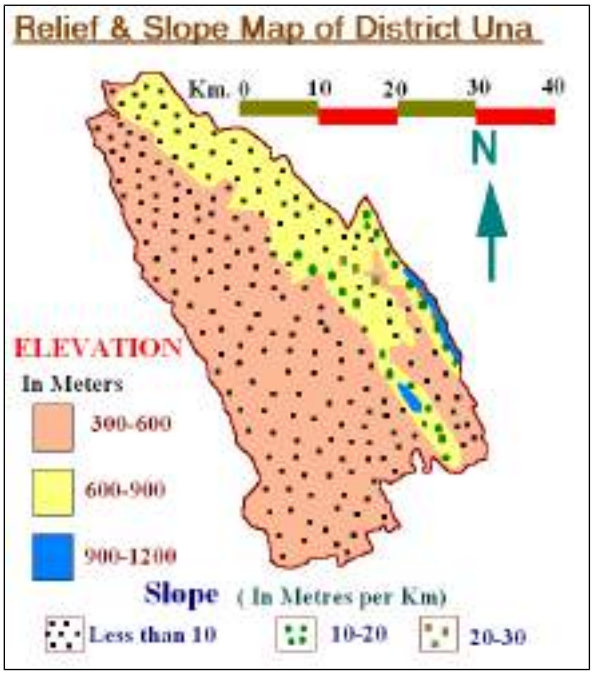
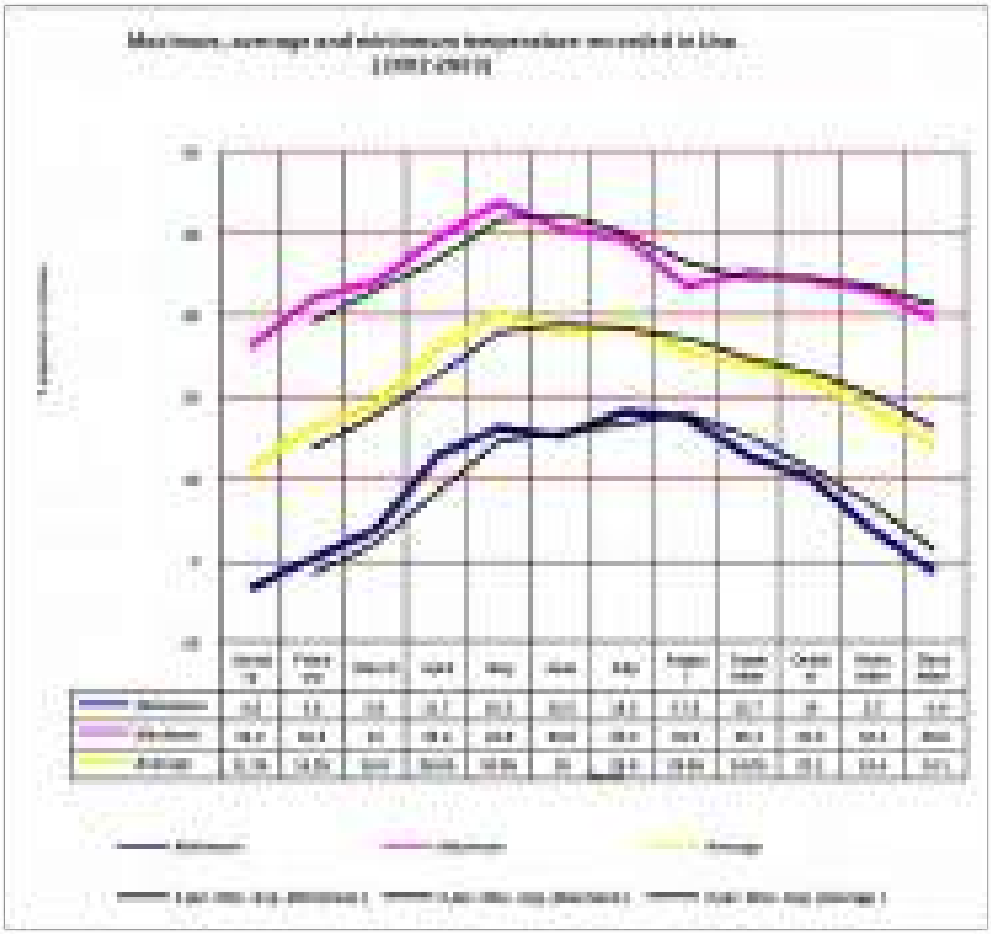


Figure 3 ***Relief*** ***and Slope Map of the District Una***

10.0: Rainfall month -wise
Showing temperature, rainfall and humidity of District Una
Table No: 9

Climate of Una District , Himachal Pradesh				
Climate		Winter	Summer	Rainy
Period		Oct.-Mid March	Mid. March-June	July-September
Weather		**Cool**	**Hot**	**Humid**
Humidity		**84%**	**55%**	**98%**
Temperature	**Max.**	**33.0 C**	**45.5 C**	**35.0 C**
	Min.	**-3.5 C**	**8.0 C**	**14.0 C**
Rainfall	**Max.**	**82.0 mm**	**69.0 mm**	**175. 0 mm**
	Min.	**1.0 mm**	**1.0 mm**	**1.0 mm**

Graph No. 7 Showing the Minimum Temperature recorded in District Una



10.1 Rainfall

The Una district can be divided into three rainfall zones as

High	above 1400 mm
Medium	between 1400 and 1200 mm
Low	less than 1200 mm

Figure 4 Shows the isohyetal map of the district.

It is clear from the isohyetal map of the district that most of the area of the district lies in the zone of low rainfall

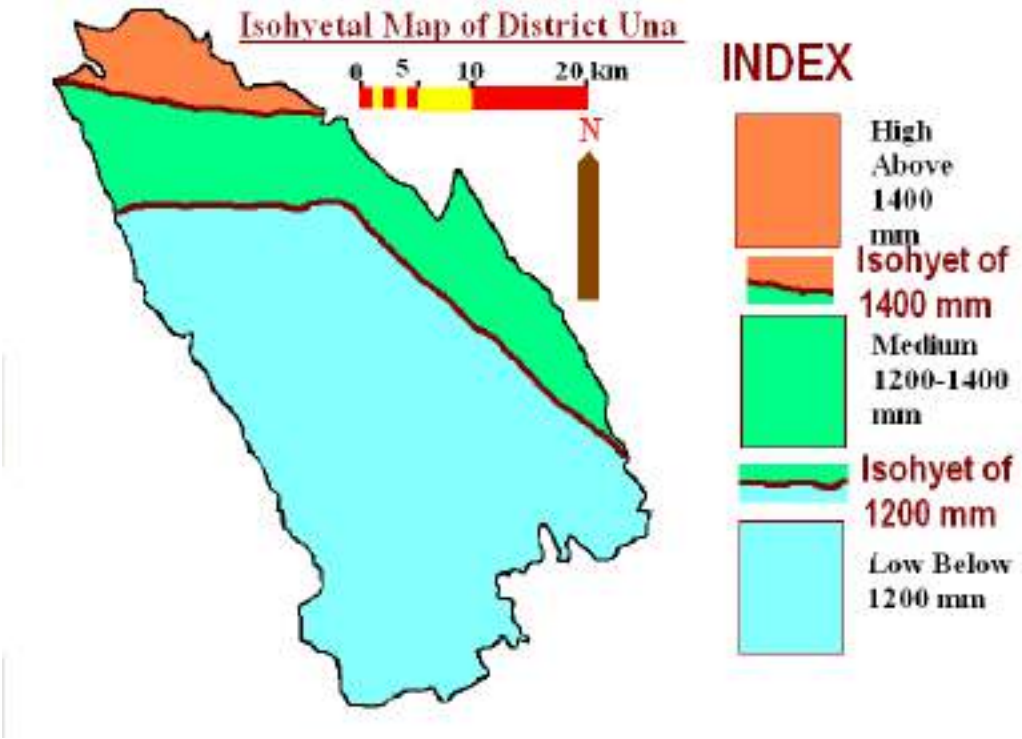
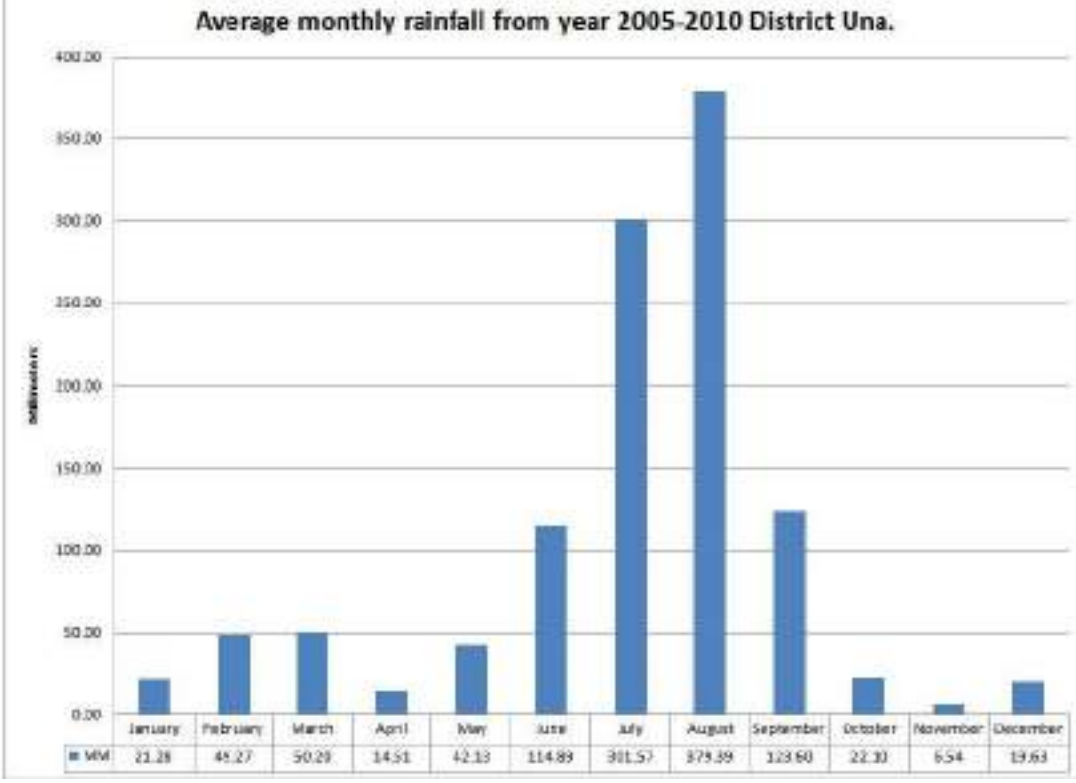


Figure 4 : **Isohyetal map of the District Una .**

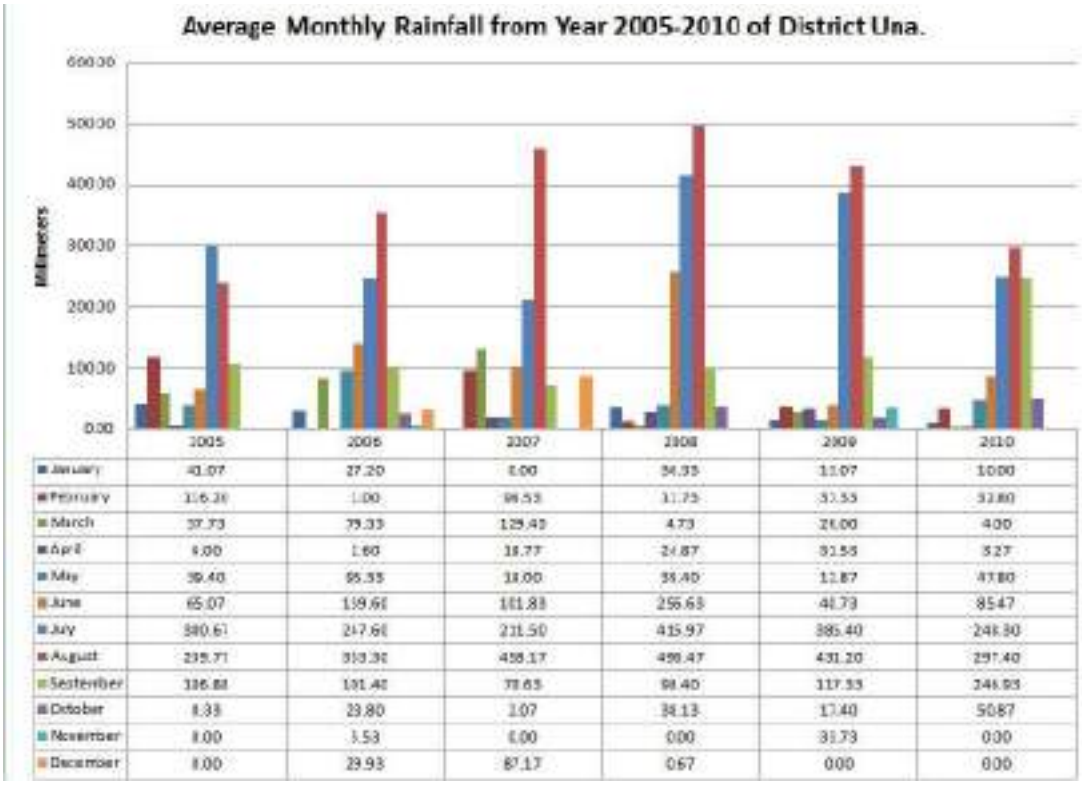
To have an idea about morphogenetic zone on the basis of rainfall it will not be ideal to classify it on the basis of the annual rainfall, because most of the precipitation of the year is received in the rainy season hence the precipitation of the monsoon season is deciding precipitation for annual replenishment, bank erosion and other factors.

Graph No. 8 Showing the average monthly rainfall recorded at Una Amb and Bangana

The monthly rainfall recorded at 3 rain gauge located at Una, Amb and Bangana

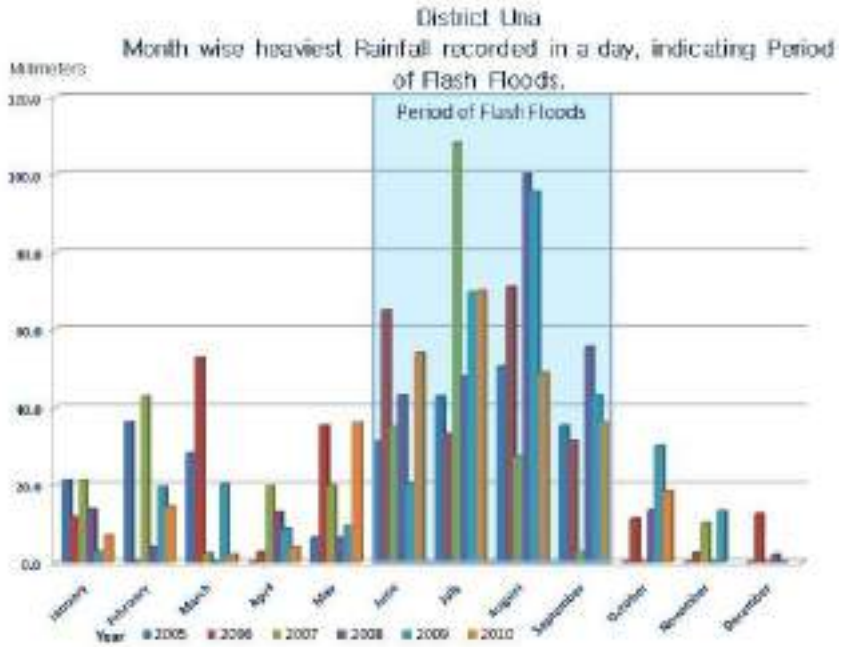


Graph No. 9 Showing the monthly rainfall recorded from 2005-2010 in District Una

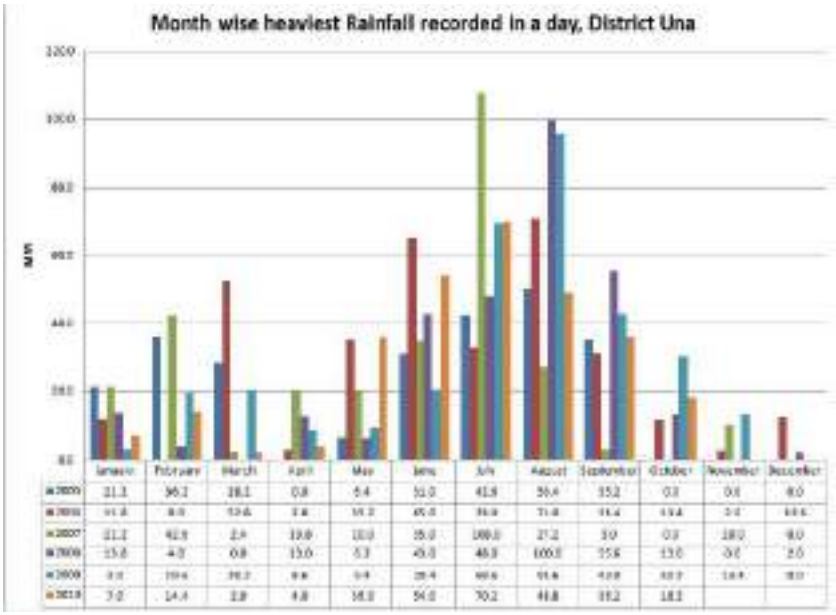


	2005	2006	2007	2008	2009	2010
January	41.07	27.20	0.00	34.33	11.07	10.00
February	116.20	1.00	98.53	11.73	51.53	32.80
March	37.73	79.33	129.40	4.73	26.00	4.00
April	6.00	1.60	18.77	24.87	51.53	5.27
May	39.40	95.33	38.00	38.40	12.87	47.80
June	65.07	139.60	101.83	256.63	41.73	85.47
July	380.61	247.60	231.50	415.97	386.40	248.30
August	235.71	310.30	458.17	498.47	431.20	297.40
September	136.80	101.40	78.63	98.40	117.33	246.93
October	8.33	23.80	2.07	38.13	17.40	50.87
November	0.00	5.53	0.00	0.00	31.73	0.00
December	0.00	29.93	87.17	0.67	0.00	0.00

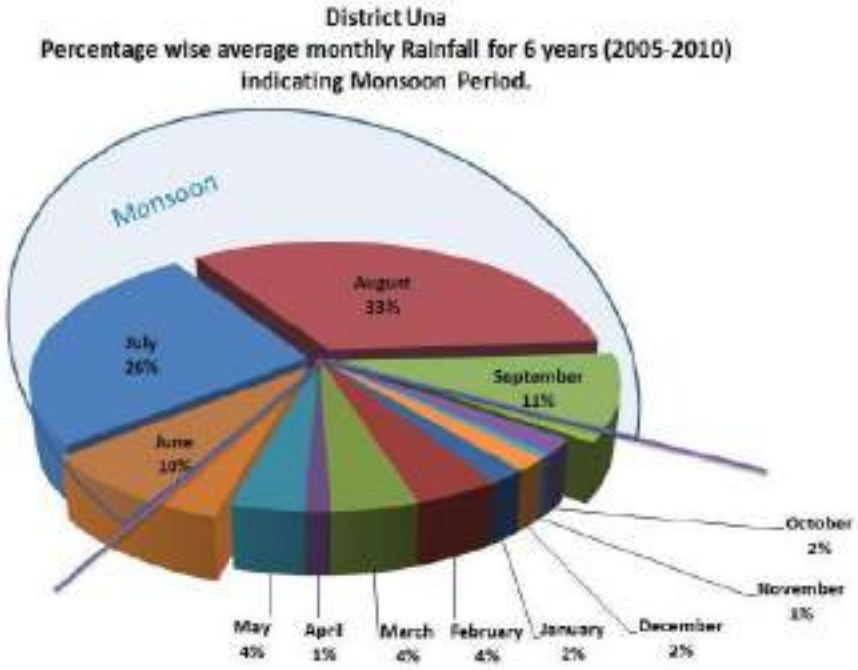
Graph No. 10 Showing the heaviest rainfall recorded in a day from 2005-2010 in District Una



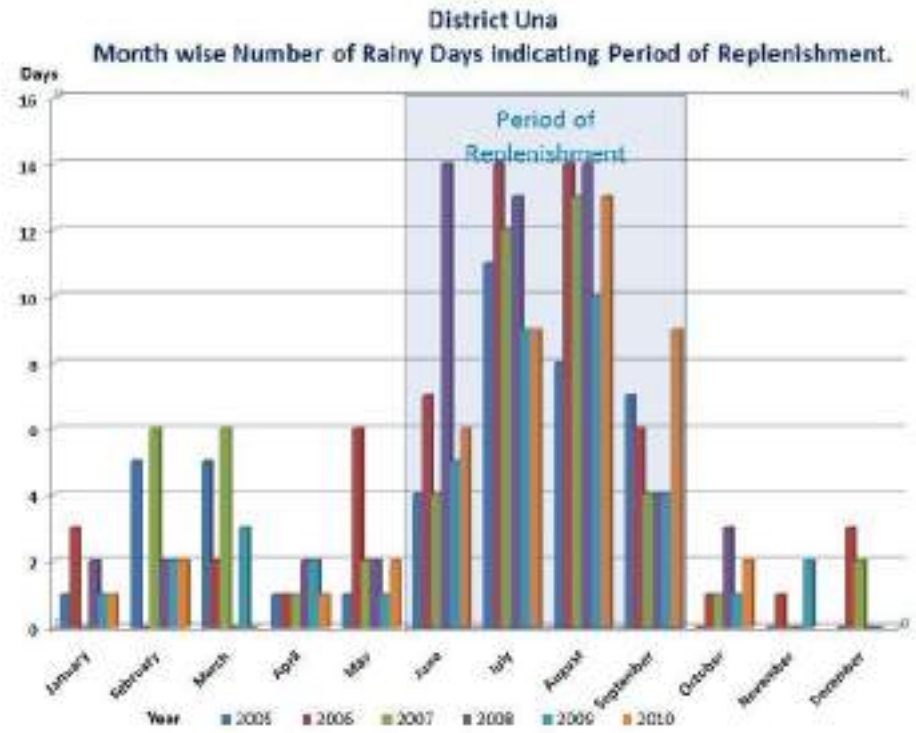
Graph No. 11 Showing the monthwise heaviest rainfall recorded in a day from 2005-2010 in District Una



Pie Diagramme 1 Showing the Percentagewise average monthly rainfall for six years indicating monsoon season



Graph No. 12 Showing the monthwise rainfall recorded from 2005-2010 in District Una



11.0 Geology and Mineral Wealth

The Shiwalik Group mainly represents the rocks of the district. In addition to this at few places the newer alluvium of Quartenary age are also present.

11.1 Siwalik Group

The Siwalik deposits are one of the most comprehensively studied fluvial sequences in the world. They comprise mudstones, sandstones, and coarsely bedded conglomerates laid down when the region was a vast basin during Middle Miocene, to Upper Pleistocene times. The sediments were deposited by rivers flowing southwards from the Greater Himalayas, resulting in extensive multi-ordered drainage systems. Following this deposition, the sediments were uplifted through intense tectonic regimes (commencing in Upper Miocene times), subsequently resulting in a unique topographical entity - the Siwalik hills. The Siwaliks are divided stratigraphically into three major subgroups - Lower, Middle, and Upper. These Subgroups are further divided into individual Formations that are all laterally and vertically exposed today in varying linear and random patterns.

Ongoing erosion and tectonic activity has greatly affected the topography of the Siwaliks. Their present-day morphology is comprised of hogback ridges, consequent, subsequent, obsequent, and resquent valleys of various orders, gullies, choes (seasonal streams), earth-pillars, rilled earth buttresses of conglomerate formations, semi-circular choe-divides, talus cones, colluvial cones, water-gaps, and

choe terraces. Associated badlands features include the lack of vegetation, steep slopes, high drainage density, and rapid erosion rates.

In the advent of Neogene a depression was formed in front of the rising mountains (Proto- Himalaya). This depression becomes a repository of a thick sequence of molassic sediments of the Siwalik.The Siwalik Group comprising conglomerates friable micaceous sandstone, siltstone and claystone.

The conglomerates in general are poorly cemented but at places they are very hard. These consist mainly of pebbles and cobbles of quartzite. The stray pebbles of granite, limestone, sandstone, breccia and lumps of claystone are also observed at places. Often the size of pebbles is large enough to be called as Boulders. The conglomerates not only occur as regular band but also as lenticular bands alternating with micaceous sandstone and claybeds. The sediments were brought down 2 to 25 million years ago by the numerous fast flowing rivers issuing forth from rapidly Rising Mountain mass of the Himalaya, in the north.

The Siwalik Group is divisible into three sub-groups respectively the Lower, Middle and Upper on the basis of the lithostratigraphy.

Table No.**10** **Showing lithostratigraphy of District Una**

Lithostratigraphy of District Una					
Group			***Lithology***	***Age***	***Approx. Thickness***
Newer Alluvium			***Sand, silt, gravel and Pebbles***	***Quatenary***	***Variable***
Siwalik Group	***Upper Siwalik***	***B***	*Predominantly massive conglomerate with red and orange clay as matrix and minor sandstone and earthy buff and brown calystone*	***Neogene***	***2300 meter***
		A	*Sandstone, clay and conglomerate alternation*		
	Middle Siwalik	***B***	*Massive Sandstone with minor conglomerate and local variegated claystone*		***1400 to 2000 meter***
		A	*Predominantly medium to coarse- grained sandstone and red clay alternation, soft pebbly with subordinate claystone, locally thick prism of conglomerate*		

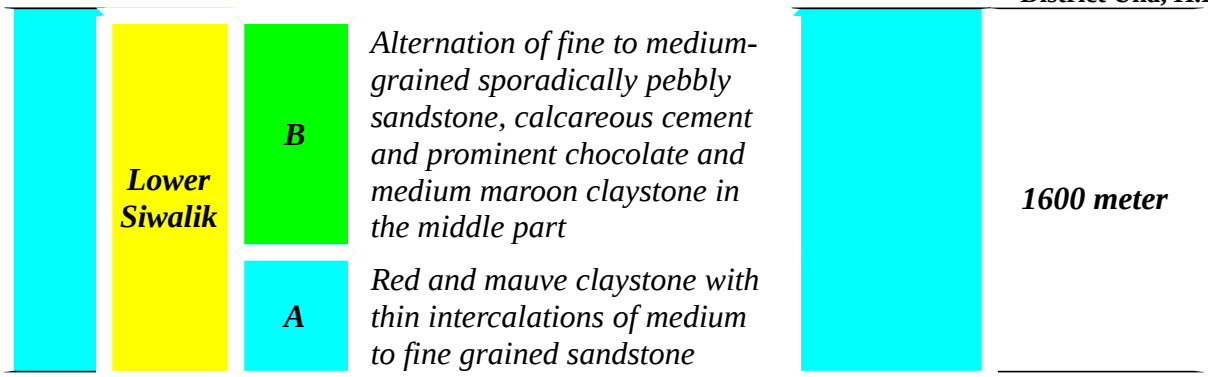

Lower Siwalik
B
A
Alternation of fine to medium-grained sporadically pebbly sandstone, calcareous cement and prominent chocolate and medium maroon claystone in the middle part
Red and mauve claystone with thin intercalations of medium to fine grained sandstone
1600 meter

Figure 5. **Geological Map of District Una**

11.2.a. Lower Siwalik: -

Table 3 ***Lithostratigraphy of Una District***

The lower Siwalik consists essentially of a sandstone-clay alternation. In district Una, the lower sequence of the lower Siwalik consists of medium grained subgraywacke interbedded with thick red clay, but higher up in sequence, sandstones are coarser and clasts become more frequent while the clays are less developed. The uppermost horizon consists of conglomerate with well-rounded clasts of grey quartzite possible derived from the Shali. The total thickness is 1600 mts.

11.3.b. Middle Siwalik: *-*

The Middle Siwalik Sub group comprises of large thickness of coarse micaceous sandstone along with some interbeds of earthy clay and conlomerate. It normally succeeds the Lower Siwalik along a gradational contact. The sandstone is less sorted than those in Lower Siwalik. Clay bends are dull coloured and silty. The general thickness is 1400 to 2000 mts

11.3.c. Upper Siwalik:-

The Upper Siwalik is mainly represented by sandstone interbedded with silt and conglomerate. The lower portion of the Upper Siwalik mainly consists of soft, massive, pebbly sandstone with itercalations of conglomerates. In the upper portion the conglomerate intercalation is replaced by the clays intercalations. The general thickness in the district is 2300 mts.

11.3.c. Newer Alluvium:-

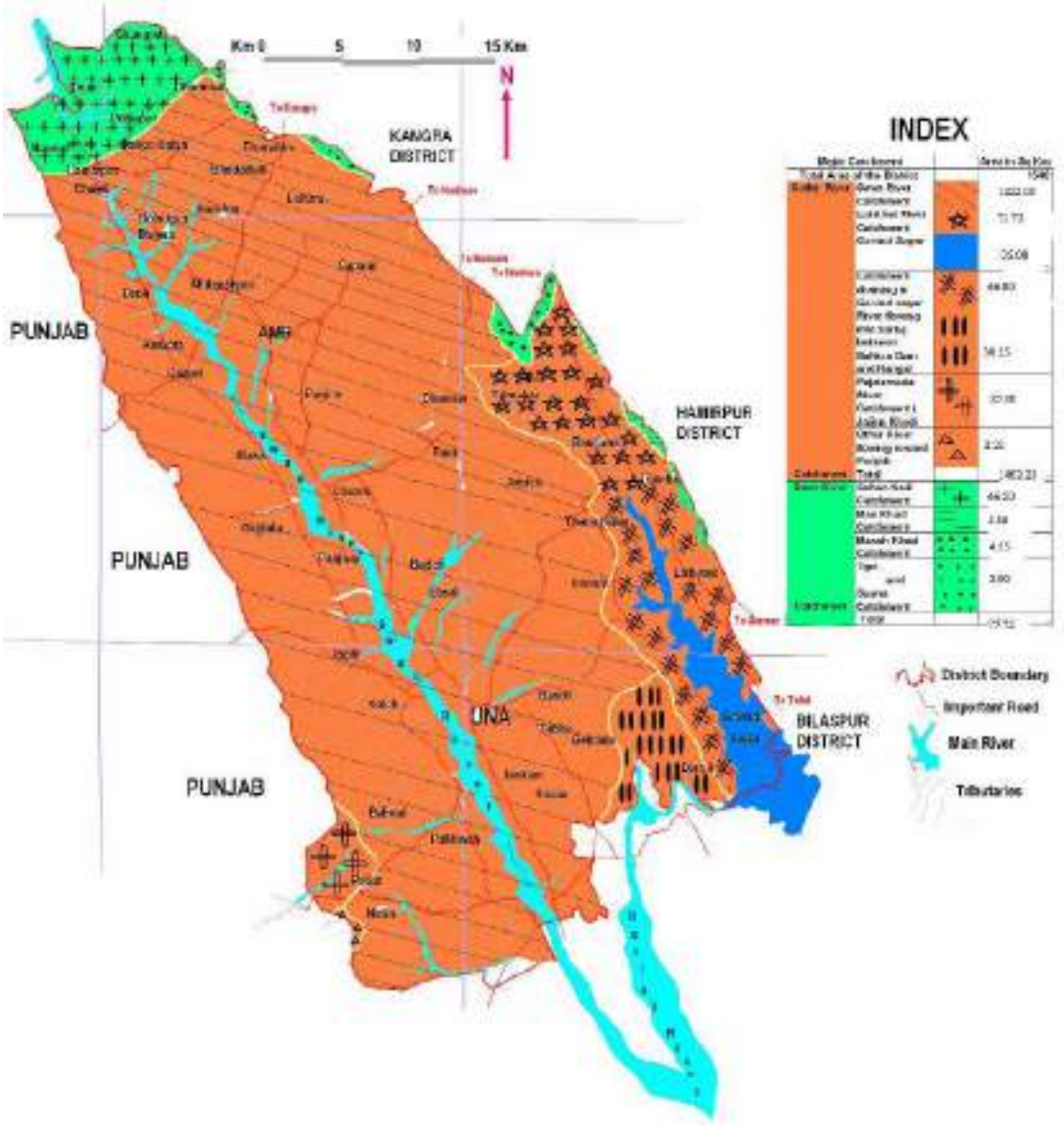
The Newer alluvium deposit occupying the wide valleys including alluvium fans and terraces of unsorted sand, silt and clay and rock fragment and boulder beds.

The lithostratigraphy of the Siwalik Group in Una is given in Table 4

11.4 Drainage System

The general drainage pattern of the Rivers/ streams in the district exhibit dendritic pattern. All rivers/streams of Una district are forming part of two major river system catchments i.e. Beas river catchment and Satluj River catchment. The northern small part of the district form the catchment area of Beas river and remaining part form the catchment of Satluj river.

Figure-6 Map Showing Catchment area of River Beas and Satluj



11.5 Beas River Catchment

In Una District, Sohan Nadi, Maseh Khad, Tipri and Suana and Man Khad are the major streams draining water into the Beas river. There are other streams which are of smaller magnitude also forming part of this catchment area. The major sub-catchments of streams forming the Beas catchment in Una District from north to south are as follow:-

Table-11 Showing catchment area of tributaries of Beas river

Name of river	Area in sqKm
Sohan Nadi Catchment	66.50
Tipri khad, Suana khad etc.	2.00
Maseh Khad Catchment	4.25
Man Khad Catchment	5.00
Total	77.75

Graph No. 13 Showing major sub-catchments of streams forming the Beas catchment in District Una

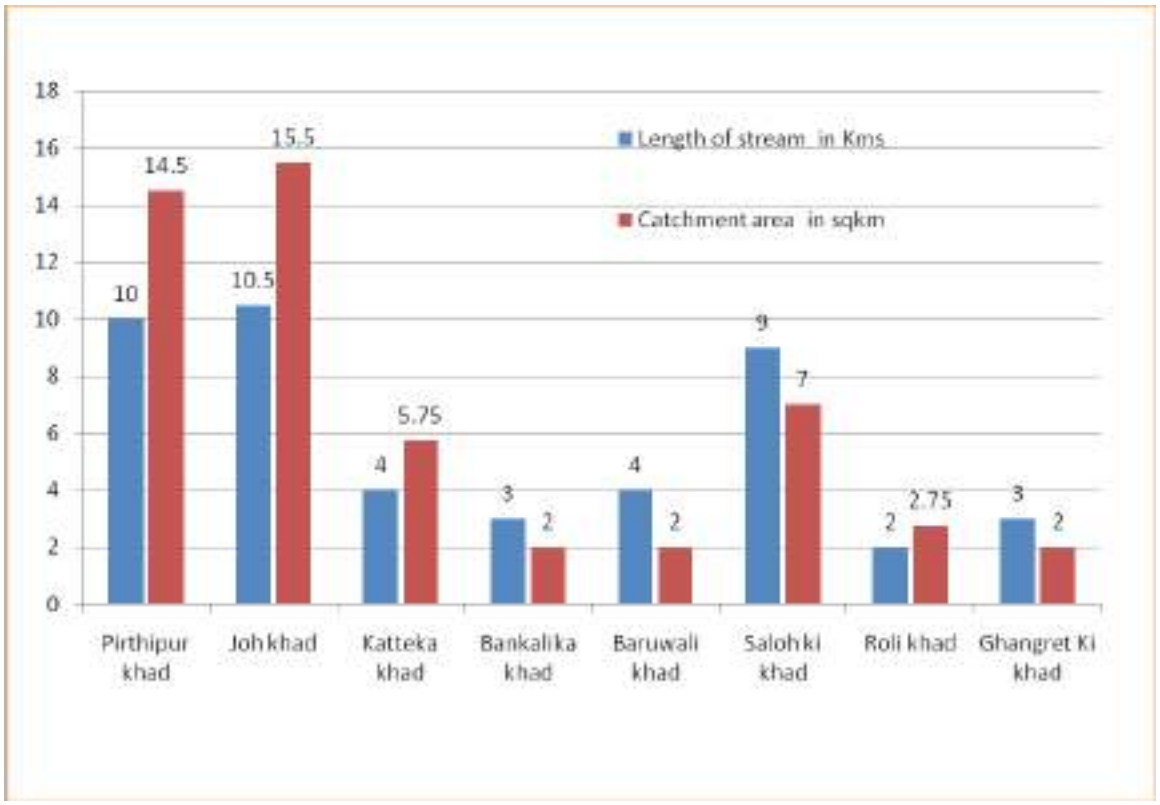
11.5.a Sohan Nadi catchment:-

The Sohan Nadi catchment forms a very small catchment on the northern side of this district. The Sohan Nadi originates from northeast side of Pirthipur village and joins with Beas river near Sansarpur Terrace.This stream exhibits a narrow width from origin to confluence with Joh khad and further downstream the width increases. The following are the tributaries which joins with Sohan Nadi in Una district.

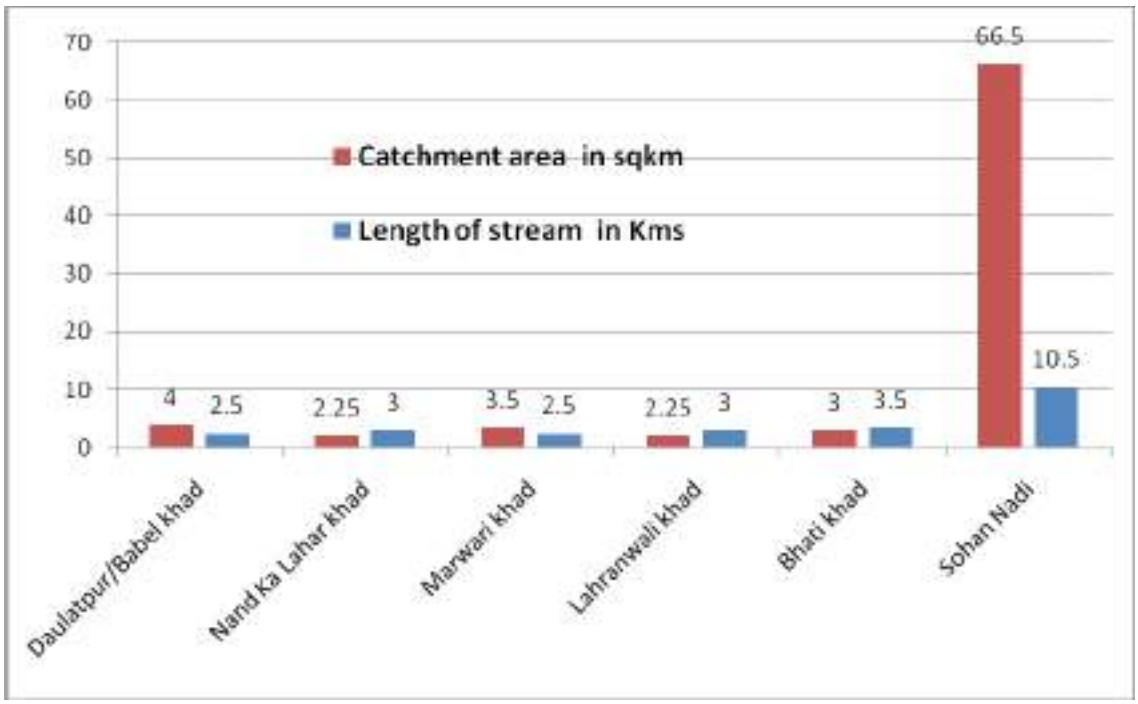
Table No.**-12 Showing morphological features of Sohan nadi and its tributaries**

Sr No,	Name of tributary	Length of stream in Kms	R.L. at origin in metres	R.L. at confluence in metres	Catchment area in sqkm	River bed area in Hectares
Right Bank						
1	Pirthipur khad	10.00	900	525	14.50	67-50-00
2	Joh khad	10.50	1018	525	15.50	90-00-00
3	Katteka khad	4.00	675	520	5.75	22-00-00
4	Bankalika khad	3.00	650	510	2.00	5-00-00
5	Baruwali khad	4.00	644	510	2.00	19-50-00
6	Saloh ki khad	9.00	947	470	7.00	50-00-00
7	Roli khad	2.00	947	460	2.75	3-50-00
8	Ghangret Ki khad	3.00	707	440	2.00	4-50-00
Left Bank						
9	Daulatpur/Babel khad	2.50	640	535	4.00	4-00-00
10	Nand Ka Lahar khad	3.00	628	530	2.25	30-00-00
11	Marwari khad	2.50	638	528	3.50	15-00-00
12	Lahranwali khad	3.00	644	525	2.25	30-00-00
13	Bhati khad	3.50	610	520	3.00	25-00-00
14	Sohan Nadi	10.50	900	439	66.50	168-75-00
	Total	**70.50**				**534-75-00**

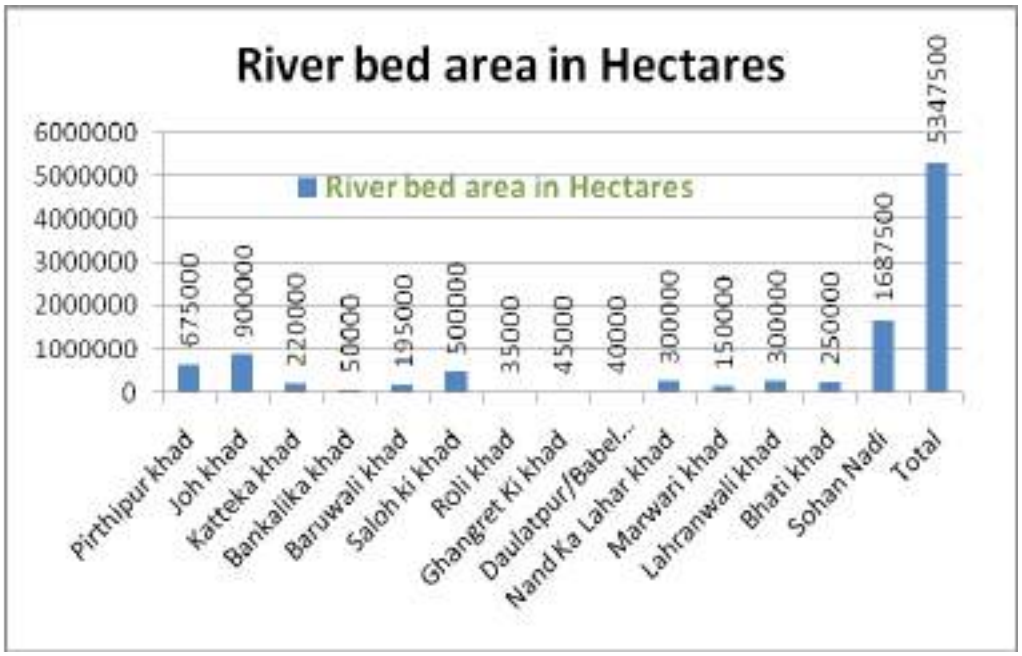
Graph No. 14 Showing Length and Catchment of tributaries joining on right bank of Sohan Nadi



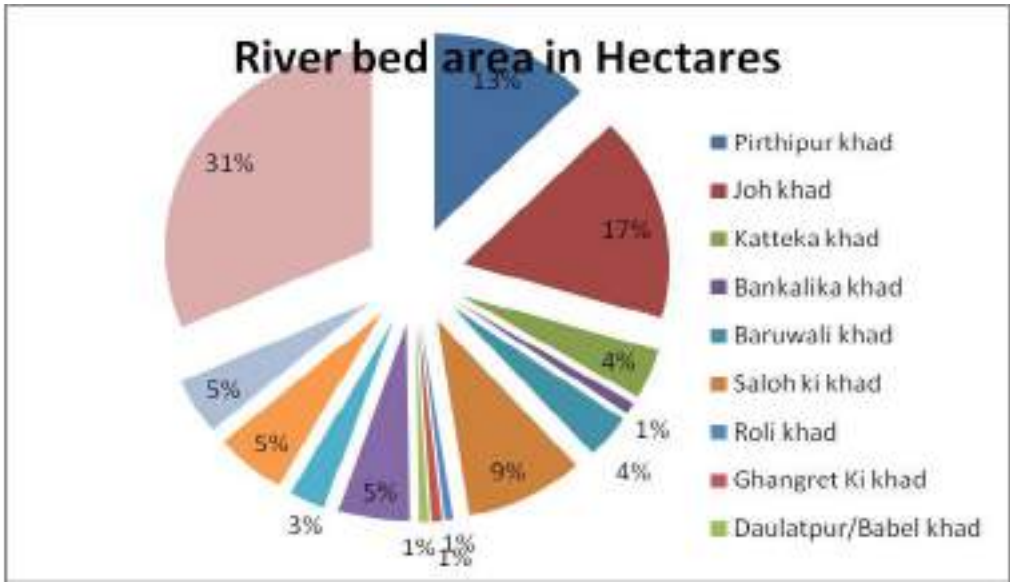
Graph No. 15 Showing Length and Catchment of tributaries joining on left bank of Sohan Nadi



Graph No.16 Showing River bed area of tributaries of Sohan Nadi



Pie Digramme 2 Showing %age wise river bed area



11.5.b. Man Khad Catchment:-

This khad flows toward east side of the District forming catchment area around 5.00 sqkm and as such the river bed area is insignificant so far as mineral potentials are concerned. The major catchment of this stream lies in Hamirpur District.

11.5.c Maseh Khad:-

This stream lies on the eastern side of this District form a small part of boundary between Hamirpur and Una with a catchment area of only around 4.25 sqkm. This stream originate near Behlan P.F.at an altitude of 789 m R.L.and joins with Beas river near Jatoli village adjoining to Nadaun. Since its river bed in District Una is very little as such mineral potentials in this river are insignificant.

11.5.d Other Streams:-

There are other streams such as Tipri, Suana Khad etc which are forming very small catchment in this district. These streams drain water from northern side of Pirthipur khad catchment. The total catchment area is estimated around 2.00 sqkm only in this District which is insignificant so far as mineral potentials are concerned

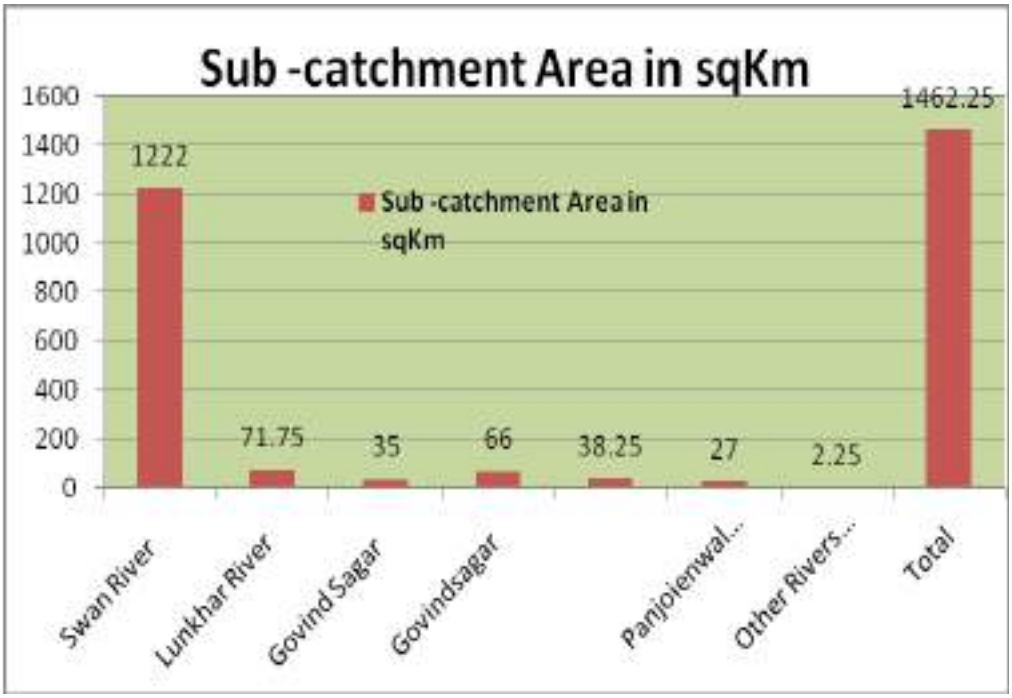
11.6 Satluj River Catchment:-

Following are major tributaries forming sub-catchment of Satluj catchment in this District.

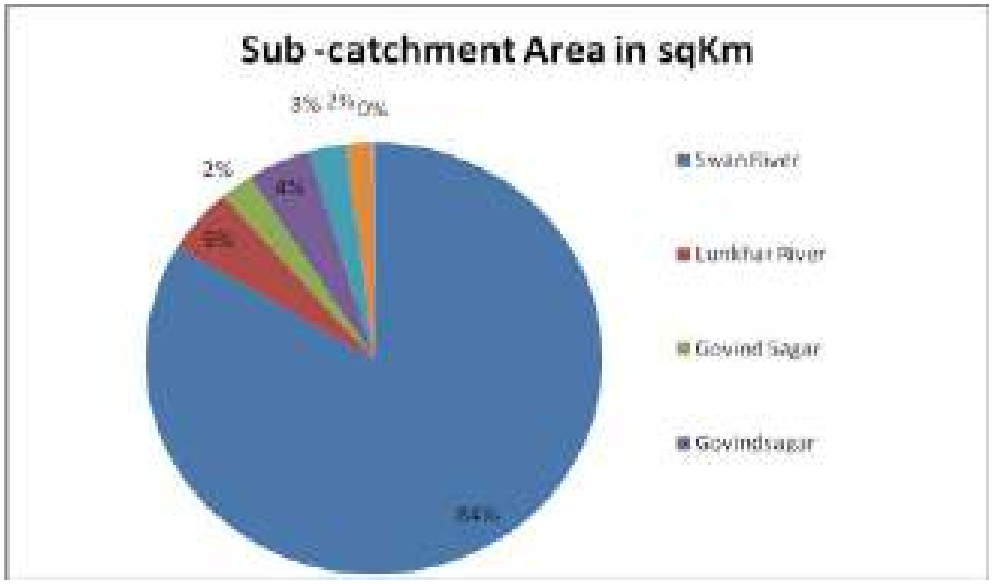
Table No.-13 Showing sub-catchment area of tributaries of Satluj River

Sr.No.	Name of river	Area in sqKm
1	Swan River Sub-Catchment	1222.00
2	Lunkhar River Sub-Catchment	71.75
3	Govind Sagar	35.00
4	Streams draining into Govindsagar	66.00
5	Streams flowing into Satluj between Bhakra Dam and Nangal	38.25
6	Panjoienwala River sub-Catchment (Jaijon Khad)	27.00
7	Other Rivers flowing toward Punjab	2.25
	Total	1462.25

Graph No.17 Showing catchment of Satluj River Tributaries in District Una



Pie Digramme 3 Showing %age wise catchment area of Satluj River Tributaries in District Una



11.6.a Swan River Sub-Catchment

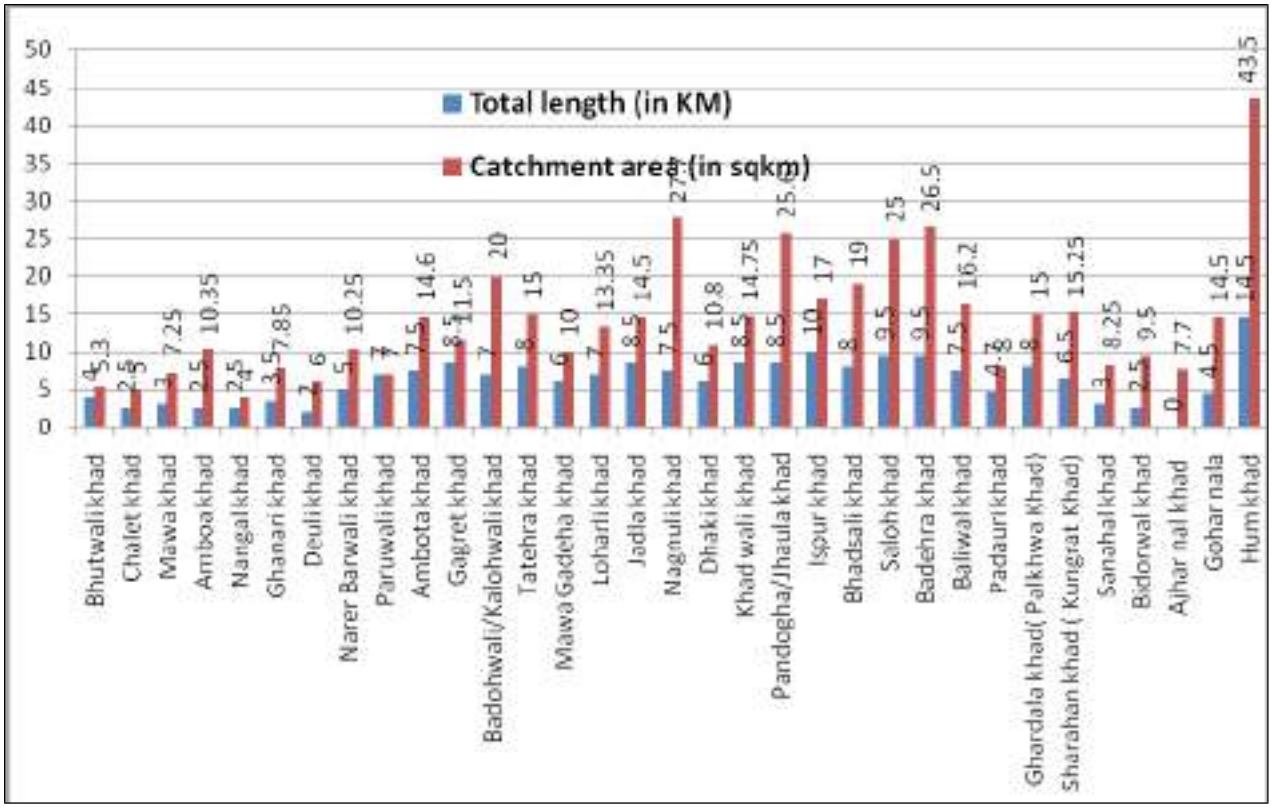
The total area of the Swan River sub-catchment is 1222 Sq Km.. It is evident from the distribution of sub-catchment that number of streams on the right bank are more than the left bank but area on left bank is much more than on right bank.

Table No.-14 Showing morphological features of Swan River and its tributaries

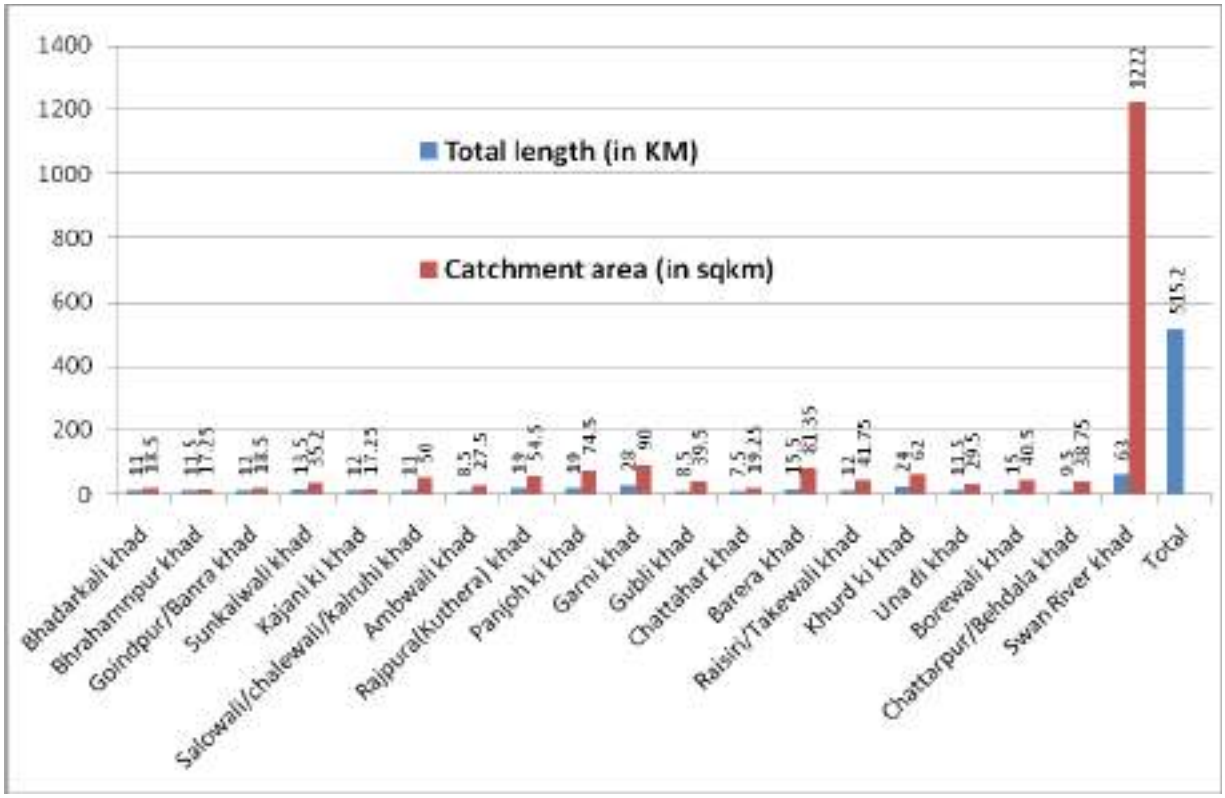
S.no	Name of River	Stream length	RL at Origin	RL at confluence	Catchment area	River bed area
		(in KM)	(in metres)	(in metres)	(in sqkm)	(in hectare)
	Swan river Catchment (Right Bank)					
1	Bhutwali khad	4.00	620	545	5.30	15-00-00
2	Chalet khad	2.50	666	534	5.00	7-00-00
3	Mawa khad	3.00	635	514	7.25	49-00-00
4	Amboa khad	2.50	610	506	10.35	53-75-00
5	Nangal khad	2.50	634	500	4.00	8-75-00
6	Ghanari khad	3.50	630	495	7.85	52-50-00
7	Deuli khad	2.00	604	493	6.00	7-00-00
8	Narer Barwali khad	5.00	600	478	10.25	50-00-00
9	Paruwali khad	7.00	625	452	7.00	55-00-00
10	Ambota khad	7.50	603	452	14.60	60-00-00
11	Gagret khad	8.50	606	442	11.50	104-00-00
12	Badohwali/Kalohwali khad	7.00	620	439	20.00	82-50-00
13	Tatehra khad	8.00	600	435	15.00	50-00-00
14	Mawa Gadeha khad	6.00	580	432	10.00	28-00-00
15	Loharli khad	7.00	612	415	13.35	60-00-00
16	Jadla khad	8.50	609	411	14.50	72-00-00
17	Nagnuli khad	7.50	500	403	27.70	87-50-00
18	Dhaki khad	6.00	500	400	10.80	65-00-00
19	Khad wali khad	8.50	637	399	14.75	90-00-00
20	Pandogha/Jhaula khad	8.50	609	378	25.60	69-00-00
21	Ispur khad	10.00	660	377	17.00	78-00-00
22	Bhadsali khad	8.00	541	376	19.00	52-50-00
23	Saloh khad	9.50	547	370	25.00	71-50-00
24	Badehra khad	9.50	613	370	26.50	180-00-00
25	Baliwal khad	7.50	600	360	16.20	143-00-00
26	Padauri khad	4.70	573	343	8.00	84-00-00
27	Ghardala khad(Palkhwa Khad)	8.00	613	355	15.00	156-00-00
28	Sharahan khad (Kungrat Khad)	6.50	570	352	15.25	90-00-00
29	Sanahal khad	3.00	565	352	8.25	63-00-00
30	Bidorwal khad	2.50	527	350	9.50	44-00-00
31	Ajhar nal khad	3,00	530	345	7.70	58-00-00
32	Gohar nala	4.50	503	340	14.50	78-50-00
33	Hum khad	14.50	589	338	43.50	150-00-00
	Swan River Catchment (left bank)					

34	Bhadarkali khad	11.00	960	525	18.50	96-00-00
35	Bhrahamnpur khad	11.50	987	520	17.25	95-00-00
36	Goindpur/Banra khad	12.00	875	517	18.50	66-00-00
37	Sunkalwali khad	13.50	989	485	35.20	175-00-00
38	Kajani ki khad	12.00	981	462	17.25	46-00-00
39	Salowali/chalewali/kalruhi khad	11.00	981	437	50.00	120-00-00
40	Ambwali khad	8.50	658	433	27.50	77-00-00
41	Rajpura(Kuthera) khad	19.00	870	433	54.50	202-50-00
42	Panjoh ki khad	19.00	706	425	74.50	210-00-00
43	Garni khad	28.00	859	415	90.00	450-00-00
44	Gubli khad	8.50	553	382	39.50	66-00-00
45	Chattahar khad	7.50	486	367	19.25	60-00-00
46	Barera khad	15.50	941	365	81.35	420-00-00
47	Raisiri/Takewali khad	12.00	747	364	41.75	117-00-00
48	Khurd ki khad	24.00	848	363	62.00	270-00-00
49	Una di khad	11.50	682	360	29.50	225-00-00
50	Borewali khad	15.00	823	355	40.50	126-00-00
51	Chattarpur/Behdala khad	9.50	597	350	38.75	46-00-00
52	Swan River	63.00	801	330	1222.00	3700-00-00
	Total	**515.2**				8882-00-00

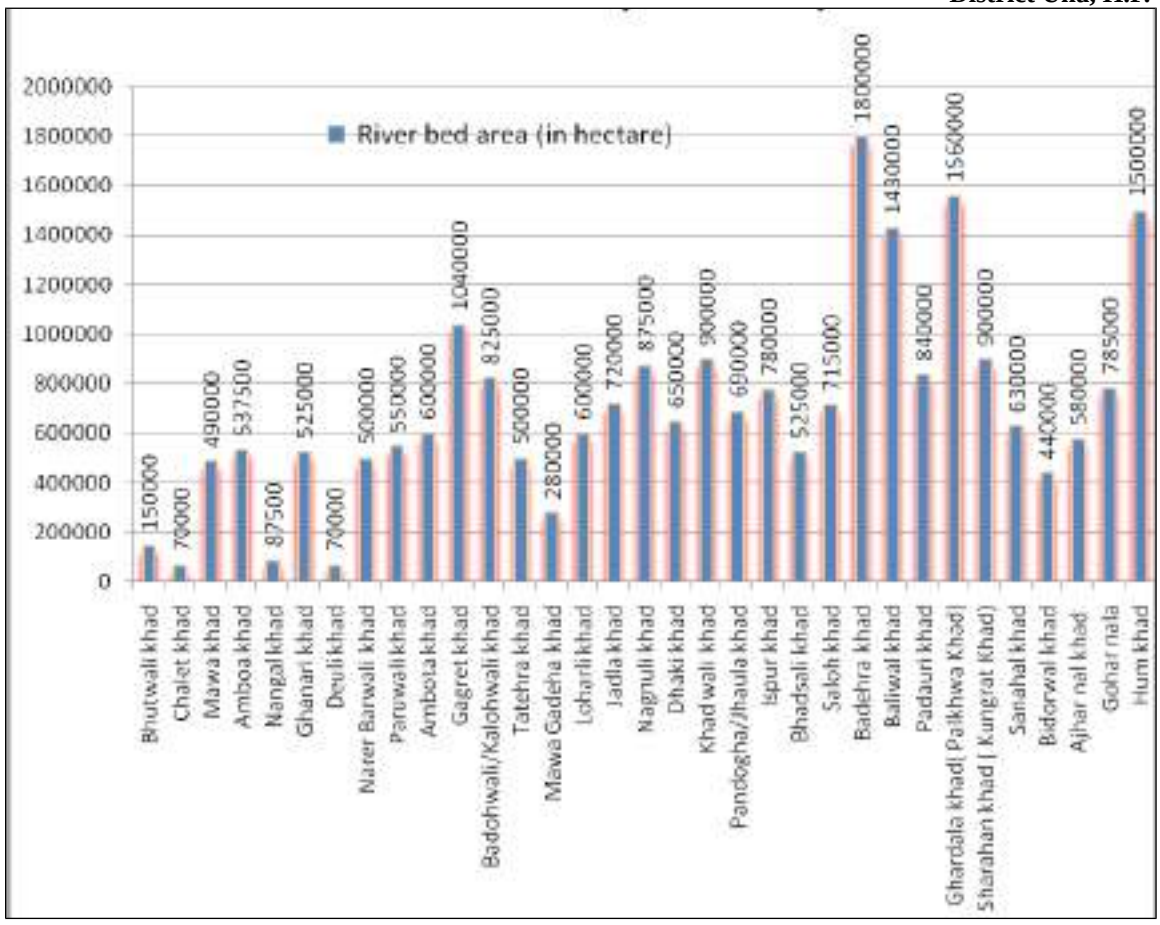
Graph No. 18 Showing Length and Catchment of tributaries joining on right bank of Swan river



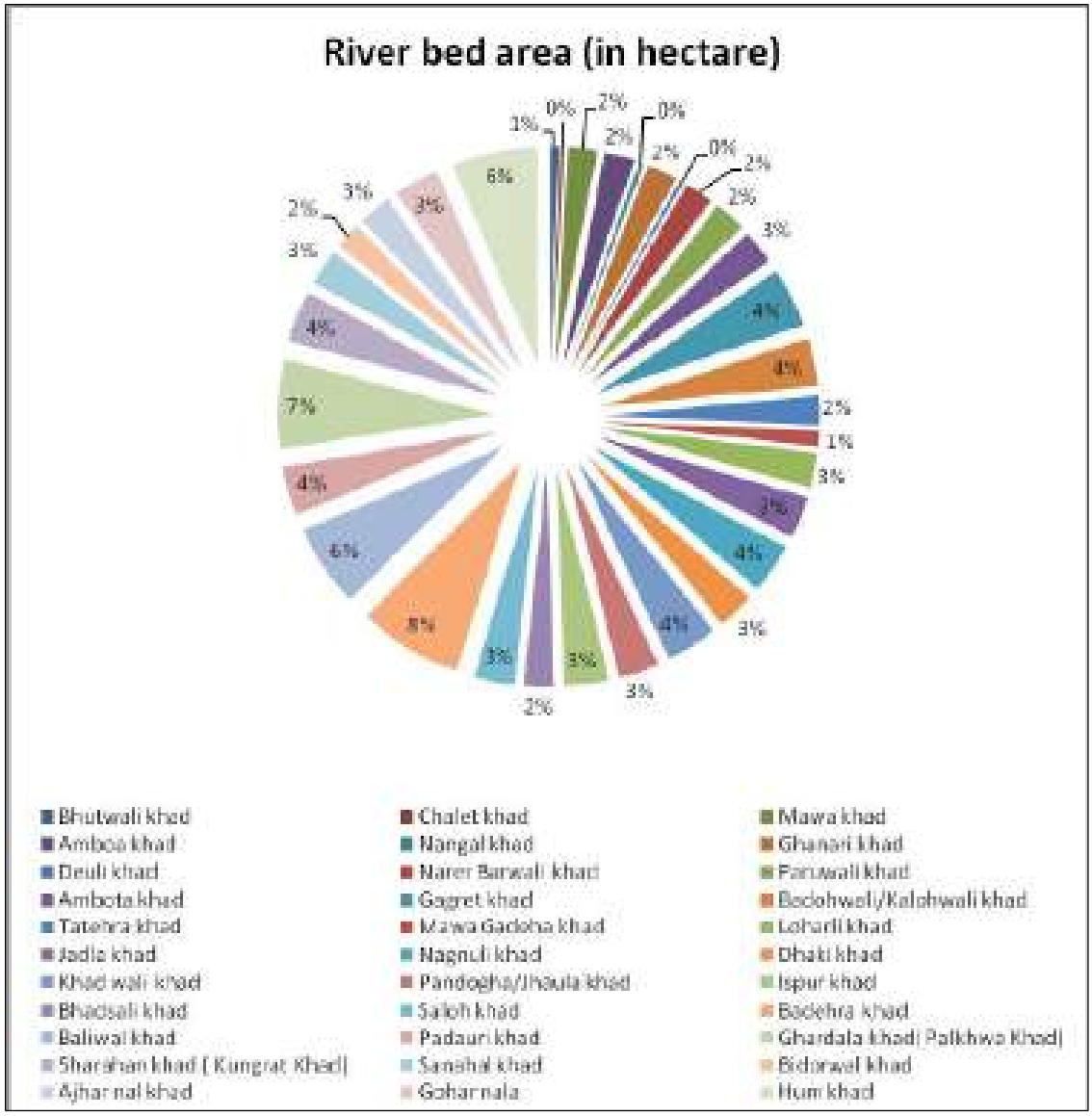
Graph No. 19 Showing Length and Catchment of tributaries joining on left bank of Swan River



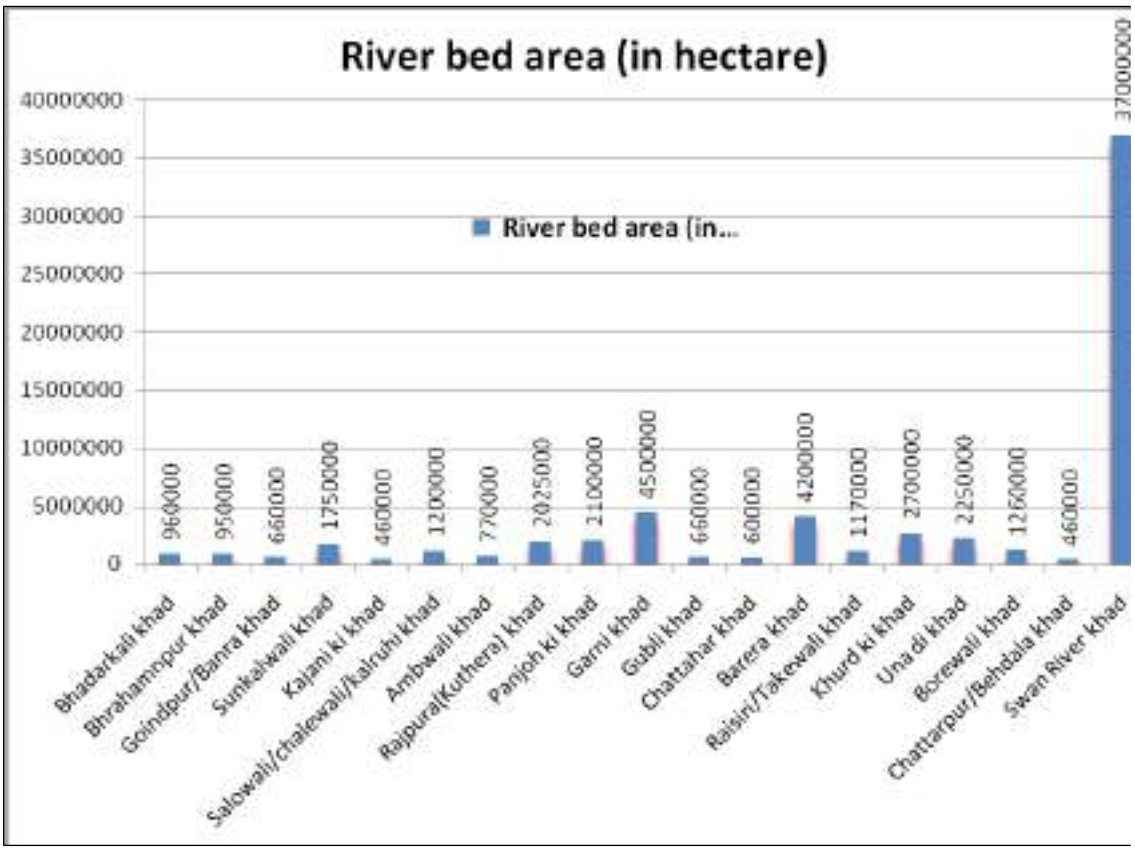
Graph No. 20 Showing River bed area (in hectares) of Streams joining on right bank of Swan River


River bed area (in hectare)
2000000
1800000
1600000
1400000
1200000
1000000
800000
600000
400000
200000
0
150000
70000
490000
537500
87500
525000
70000
500000
550000
600000
1040000
825000
500000
280000
600000
720000
875000
650000
900000
690000
780000
525000
715000
1800000
1430000
840000
1560000
900000
630000
440000
580000
785000
1500000
Bhutwali khad
Chalet khad
Mawa khad
Amboa khad
Nangal khad
Ghanari khad
Deuli khad
Narer Barwali khad
Paruwali khad
Ambota khad
Gagret khad
Badohwali/Kalohwali khad
Tatehra khad
Mawa Gadeha khad
Loharli khad
Jadla khad
Nagnuli khad
Dhaki khad
Khad wali khad
Pandogha/Jhaula khad
Ispur khad
Bhadsali khad
Saloh khad
Badehra khad
Baliwal khad
Padauri khad
Ghardala khad(Palkhwa Khad)
Sharahan khad (Kungrat Khad)
Sanahal khad
Bidorwal khad
Ajhar nal khad
Gohar nala
Hum khad

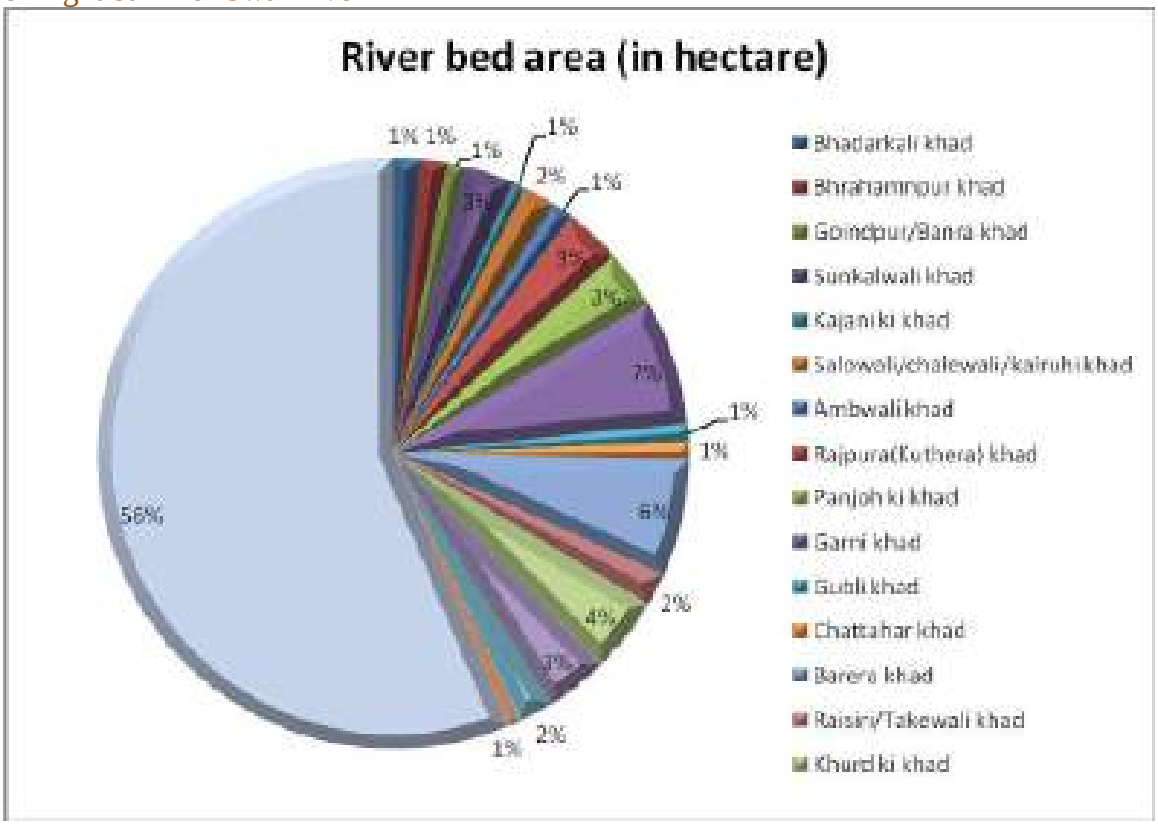
Pie Digramme No.4 Showing %age wise river bed area of right bank Streams of Swan river



Graph No. 21 Showing River bed area (in hectare) of Swan river and Streams joining on right bank of Swan river



Pie Digramme No. 5 Showing %age wise river bed area of Swan river and strems joining on right bank of Swan river



11.6.b Lunkhar Khad Sub Catchment

Presently more than 50% area of Lunkhar Khad Sub-catchment is submerged under Govindsagar hence the area above the Govind sagar reservoir has been taken into consideration for mineral concession. This stream flows on the eastern side of this District in south to south east direction and then merge into Govindsagar reservoir. The catchment area of this stream is around 71.75 sqkm.

11.6.c Govind Sagar Sub- Catchment

The river course of Satluj river flowing in part of District Una has been converted into a lake after construction of Bhakra dam with an area of 35 sqkm. The reservoir is full of water during monsoon season but the water level recedes when the water is used for generation of electricity and irrigation purpose during other seasons of the year and part of land gets exposed. The exposed land is full of silt and there is no mineral worth useful.

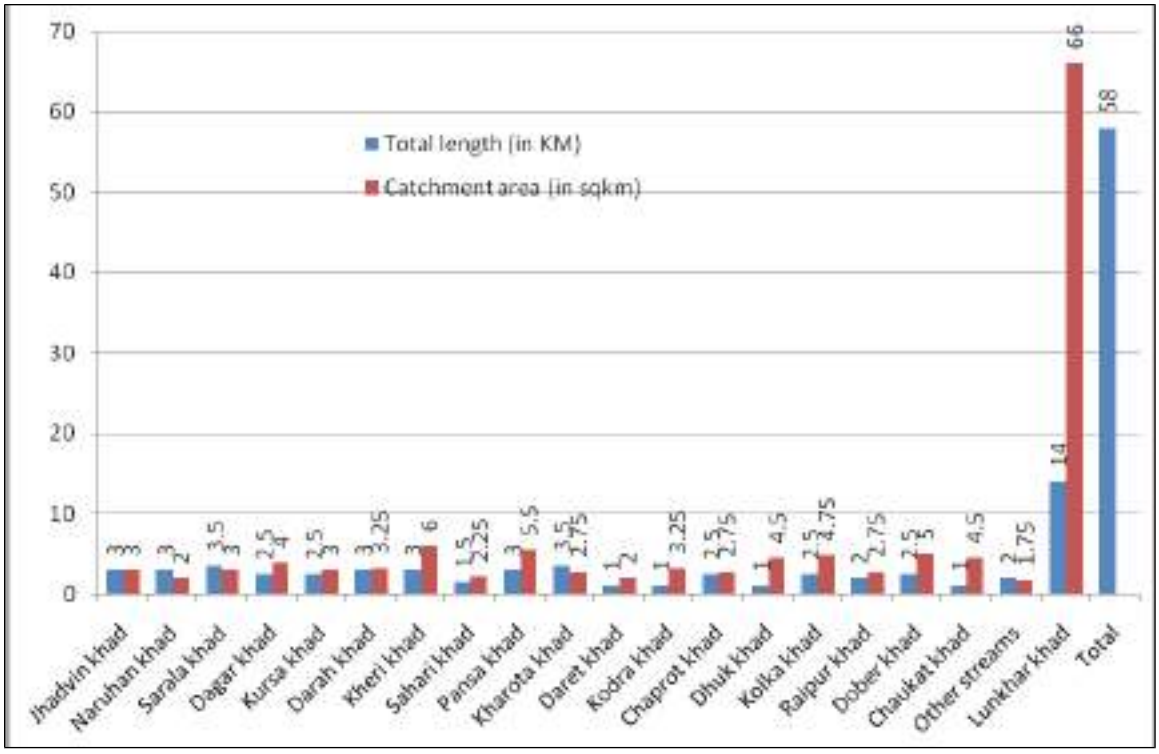
11.6.d Streams draining into Govindsagar

Some of the streams are draining directly into the Govind Sagar and the detail is given below

Table No.-15 Morphological features of streams draining into Govindsagar

S.no	Name of River	Stream length	RL at Origin	RL at confluence	Catchment area	River bed area
		(in KM)	(in metres)	(in metres)	(in sqkm)	(in hectare)
	Govind Sagar drainage (Left bank)					
1	Jhadvin khad	3.00	1055	520	3.00	6-00-00
2	Naruhan khad	3.00	1045	520	2.00	4-50-00
3	Sarala khad	3.50	1041	520	3.00	3-00-00
4	Dagar khad	2.50	1065	520	4.00	4-50-00
5	Kursa khad	2.50	1000	520	3.00	3-00-00
6	Darah khad	3.00	1097	520	3.25	3-00-00
7	Kheri khad	3.00	1112	520	6.00	5-25-00
8	Sahari khad	1.50	640	520	2.25	1-75-00
9	Pansa khad	3.00	517	520	5.50	2-50-00
10	Kharota khad	3.50	1048	520	2.75	2-70-00
11	Daret khad	1.00	800	520	2.00	2-00-00
12	Kodra khad	1.00	974	520	3.25	1--25—00
	Govind sagar drainage (Right bank)					
13	Chaprot khad	2.50	848	520	2.75	3-00-00
14	Dhuk khad	1.00	641	520	4.50	1-75-00
15	Kolka khad	2.50	820	520	4.75	2-50-00
16	Raipur khad	2.00	945	520	2.75	1-75-00
17	Dober khad	2.50	997	520	5.00	3-50-00
18	Chaukat khad	1.00	840	520	4.50	1-00-00
19	Other streams	2.00			1.75	2-00-00
20	Lunkhar khad	14.00	789	520	66.00	136-50-00
	Total	**58.00**				**191-45-00**

Graph No. 22 Showing Length and Catchment area of tributaries of Govind Sagar



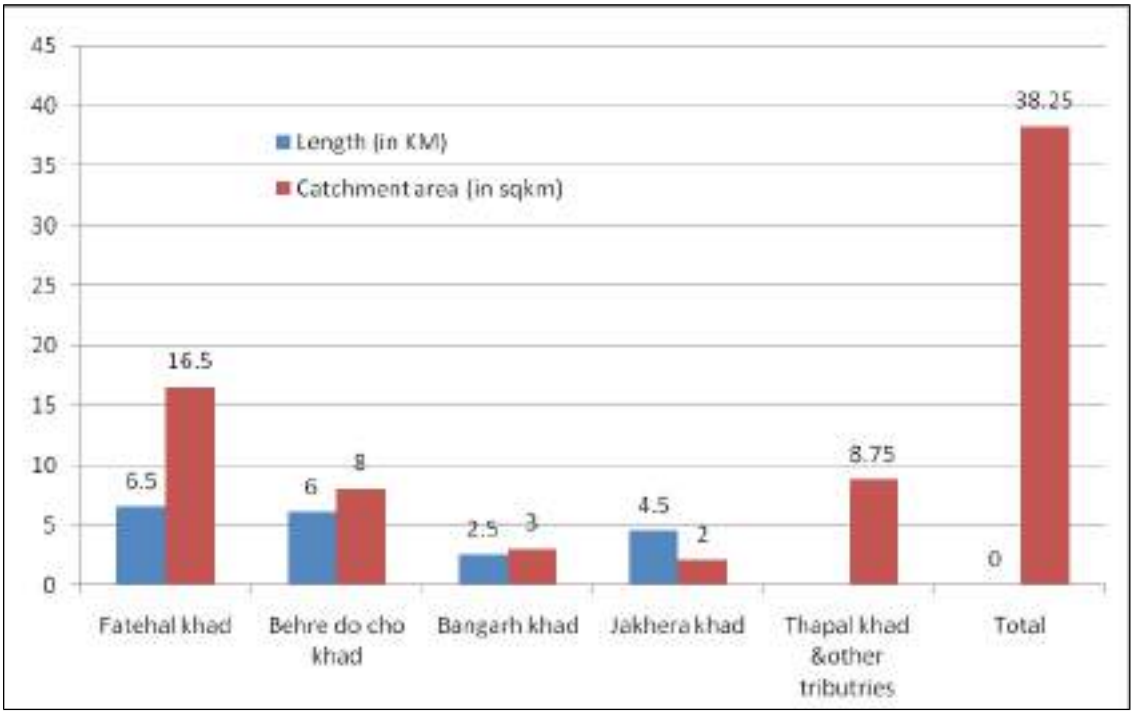
11.6.e Streams flowing into Satluj between Bhakra Dam and Nangal :-

The following streams are flowing into Satluj between Bhakra Dam and Nangal

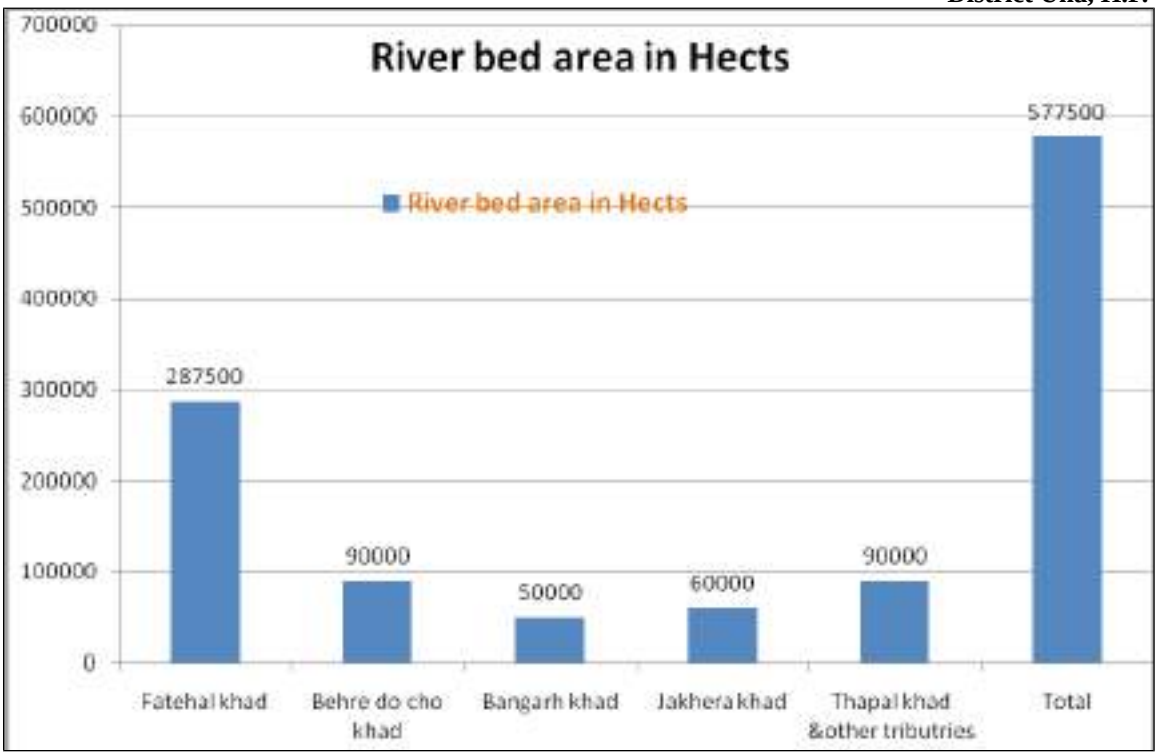
Table No.-16 Showing Morphological features of streams flowing into satluj between Bhakra Dam and Nangal

S.no	Name of River	Stream length	RL at Origin	RL at confluence	Catchment area	Total area
		(in KM)	(in metres)	(in metres)	(in sqkm)	(in hectare)
1	Fatehal khad	6.50	1036	350	16.50	28-75-00
2	Behre do cho khad	6.00	999	350	8.00	9-00-00
3	Bangarh khad	2.50	580	350	3.00	5-00-00
4	Jakhera khad	4.50	580	350	2.00	6-00-00
5	Thapal khad &other tributries				8.75	9-00-00
6	**Total**	**19.50**			**38.25**	**57-75-00**

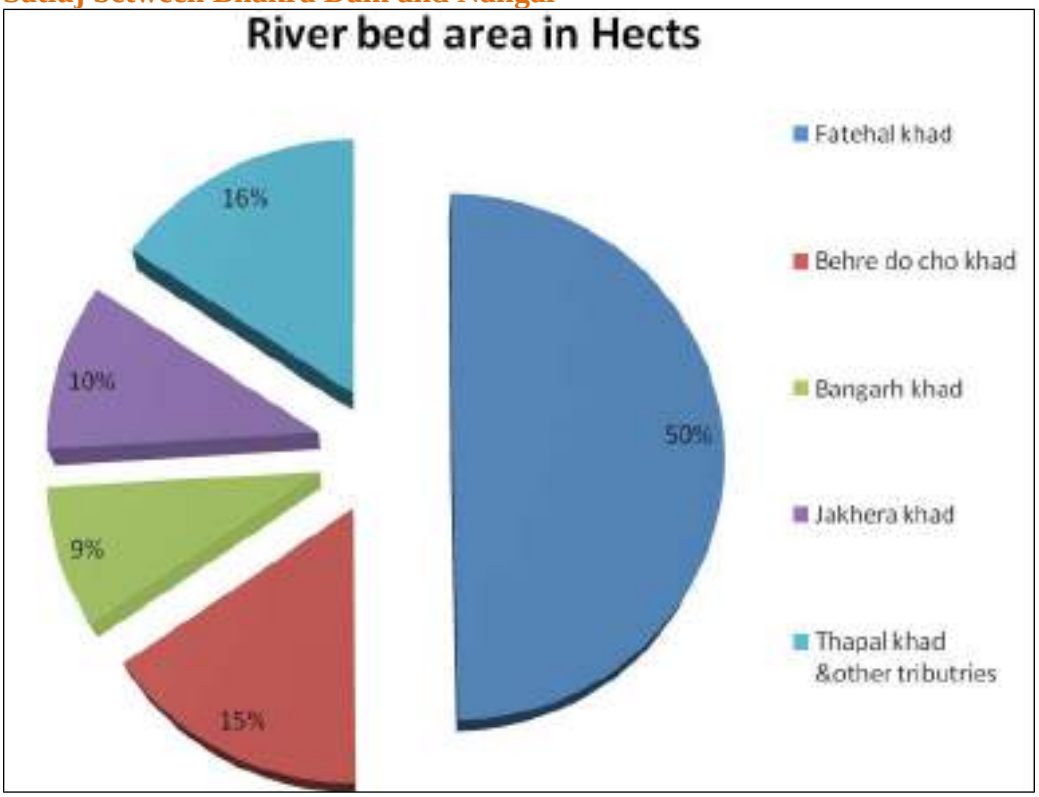
Graph No. 23 Showing length and Catchment area of Streams flowing into Satluj between Bhakra Dam and Nangal



Graph No. 24 Showing river bed area of Streams flowing into Satluj between Bhakra Dam and Nangal



Pie Digramme No. 6 Showing %age wise river bed area of Streams flowing into Satluj between Bhakra Dam and Nangal



11.6.f Panjoienwala River Catchment (Jaijon Khad):-

The Panjoinwala khad is flowing on the extreme south western side of this District and form catchment area around 27 sqkm

11.6.g Other Rivers flowing toward Punjab

Some small streams are flowing towards Punjab on the extreme south western side and form catchment area around 2.00 sqkm. Since the magnitude of these streams is very small as such these are not taken into consideration for calculation of reserves.

11.7 Calculation of Mineral Deposits and Annual Deposition in the Stream Beds

As already explained, the deposition will occur when a loss of energy results in a decrease in velocity. This may be due to such things as declining gradient, a decrease in water volume, an increase in cross-sectional area (particularly pools, lakes, and oceans), or by local obstructions. An excessive load produced by increased erosion in the drainage basin or tributary valleys, or from glaciofluvial outwash will also inevitably lead to deposition. The accumulations of stream deposits are called alluvium. The alluvium in river bed is deposited containing a mixture of different constituents of various particle sizes. Wentworth's, 1935, Allen, 1936, Twenhofel, 1937 defined the limits of common grade and rock terms which are given in following table.

Table No.-17 Showing Wentworth's table of particle size

<table>
<tr><th rowspan="2">Size</th><th colspan="3">Rounded, Subrounded, Subangular</th></tr>
<tr><th colspan="2">Fragment</th><th>Aggregate</th></tr>
<tr><td rowspan="4">256 mm--

64 mm---

4 mm---</td><td>Boulder</td><td rowspan="3">"Roundstone"</td><td>Boulder gravel Boulder conglomerate</td></tr>
<tr><td>Cobble</td><td>Cobble gravel Cobble conglomerate</td></tr>
<tr><td>Pebble</td><td>Pebble gravel Pebble conglomerate</td></tr>
<tr><td colspan="2">Granule</td><td>Granule gravel</td></tr>
</table>

2 mm-- 1/16 mm--- 1/256 mm-------	Sand	Sand Sandstone
	Silt	Silt Siltstone
	clay	Clay Shale

The Boulder is defined as a detached rock mass somewhat rounded or otherwise modified by abrasion in transport and larger than a cobble with minimum size of 256mm (about 10inch). A cobble is defined in the same manner as boulder except that it is restricted in size from 64 to 256mm. A pebble is a rock fragment larger than a coarse sand grain or granule and smaller than a cobble which has been rounded or otherwise abraided by the action of water, wind or ice and varies in size between 4 and 64mm in diameter. The unconsolidated accumulation of pebble, cobbles, or boulders is gravel which may be designated pebble-gravel, cobble-gravel etc. The term sand is used to denote an aggregate of mineral or rock grains greater than 1/16mm and less than 2mm in diameter. Wentworth (1922) proposed the term granule to cover material 4 - 2mm in size. Silt defined as from 1/16 to 1/256mm in size and clay less than 1/256mm in diameter completes the list of common size terms.

The mineral deposition in a river bed is more pronounced during rainy season although the quantum of deposition varies from stream to stream depending upon numbers of factors such as catchment lithology, discharge, river profile and geomorphology of the river course. The particle size may vary depending upon the stage of river i.e. youth, mature and old age. In Una District during field survey it is observed that annual deposition in various streams vary from 3 cms to 8 cms. However there are certain geomorphological features developed in the river bed such as channel bars, point bars etc. where annual deposition is much more even two to three metres.It is also important to mention here that there is a provision in the river/strem bed mining policy guidelines where collection of material upto a depth of 1 metre is allowed in a single season where mineral concessions have been granted, but it is noticed that during flood season whole of the pit so excavated is completely filled up and as such the excavated area is replenished with new harvest of mineral.

In order to calculate the mineral deposits in the stream beds, the mineral constituents have been categorized as clay, silt, sand, bajri and boulder and there average %age is taken into account. It is observed in different rivers/streams that % age of boulders varies from 10% to 40%, bajri from 15% to 35 %, sand from 20% 40% and silt and clay totalling from 10% 20 %. Only boulder, bajri and sand is the resource mineral i.e. usable mineral and rest is taken as waste. Further the Survey of India Topo-Sheets were used as base map to know the extent of river course. The mineral reserves have been calculated only upto 1.00 metre depth and specific gravity of 2.25 has been taken for calculation of mineral reserves. There are some portions in the river beds such as channel bars, point bars and central islands where the annual deposition is raising the level of river bed thus causing shifting of the rivers towards banks causing cutting of banks and at such locations, removal of this material upto the bed level is essential to channelize and control the river flow in its central part to check the bank cutting. While calculating the mineral potentials, the mineral deposits lying in the sub-tributaries of that particular stream/river has not been taken into consideration. Since these mineral deposits are adding annually to the main river, the mineral deposits will be much more.

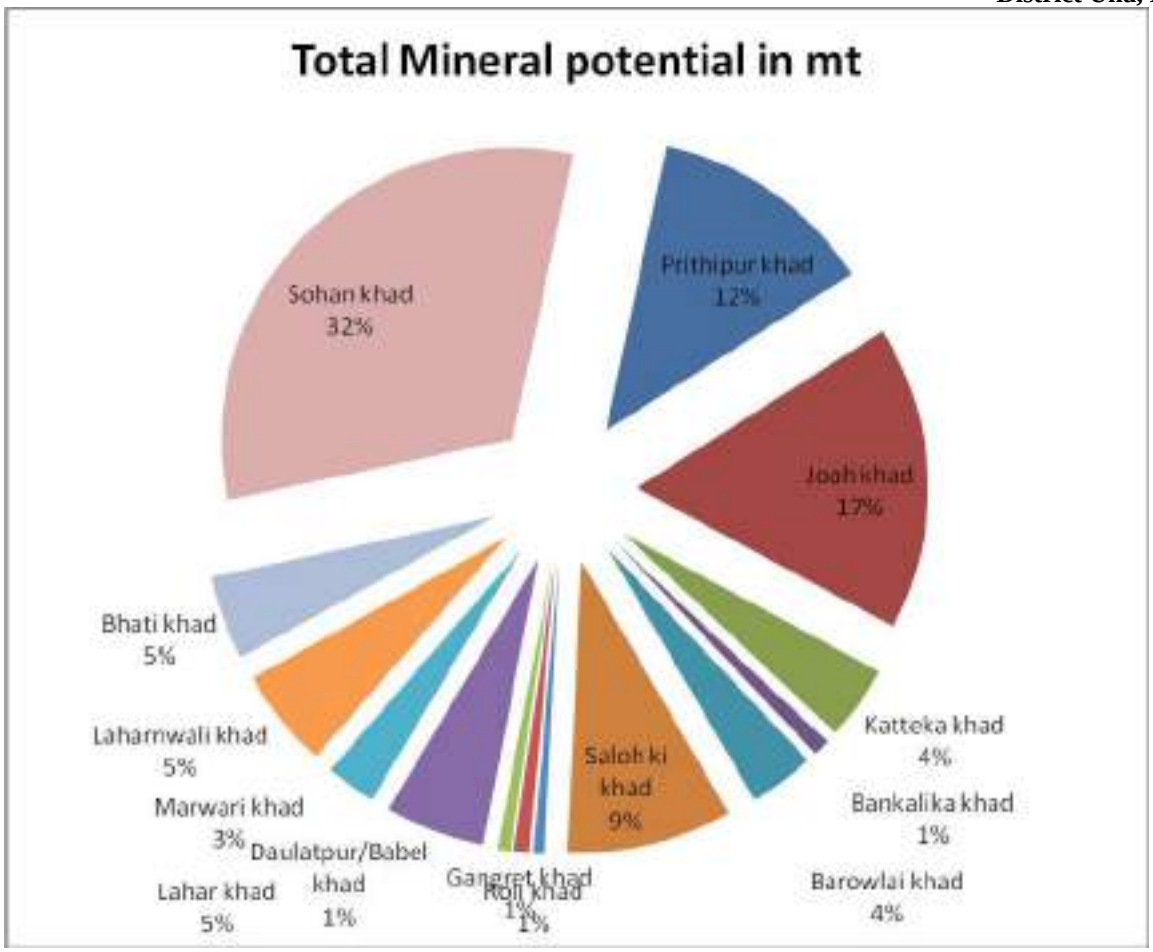
11.8 Mineral potential in Beas River

11.8.a Sohan Nadi Sub-Catchment

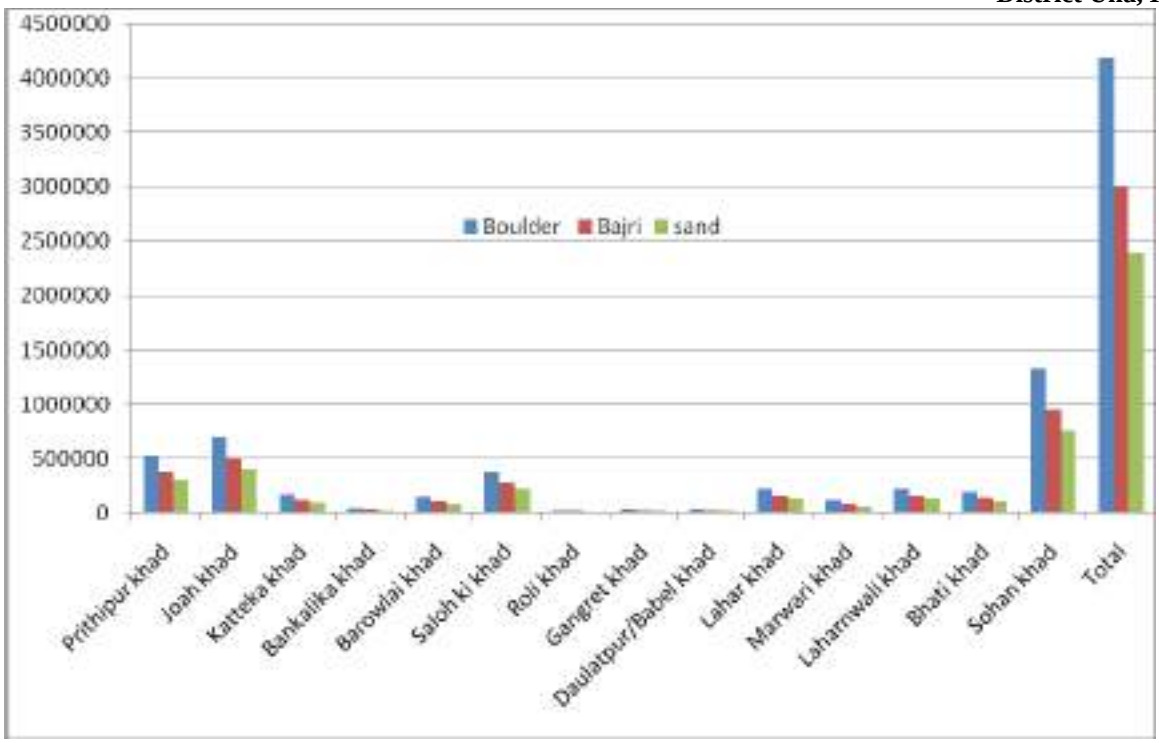
Table No.-18 Showing River bed area and Mineral potential in Sohan Nadi and its Tributaries in District Una

Sr No,	Name of tributary	River bed area in hectares	Mineral potentials in metric tonnes			Total mineral potential in metric tonnes
			Boulder	Bajri	Sand	
Right Bank						
1	Prithipur khad	67-50-00	531000	380000	300000	12,11,000
2	Joah khad	90-00-00	709000	506000	405000	16,200,00
3	Katteka khad	22-00-00	173000	124000	99000	396000
4	Bankalika khad	5-00-00	39000	28000	22500	89500
5	Barowlai khad	19-50-00	153000	109000	87000	349000
6	Saloh ki khad	50-00-00	380000	280000	225000	885000
7	Roli khad	3-50-00	27000	19000	15000	61000
8	Gangret khad	4-50-00	35000	25000	20000	80000
Left Bank						
9	Daulatpur/Babel khad	4-00-00	31000	22000	18000	71000
10	Lahar khad	30-00-00	230000	168000	135000	533000
11	Marwari khad	15-00-00	118000	84000	67000	269000
12	Laharnwali khad	30-00-00	230000	168000	135000	533000
13	Bhati khad	25-00-00	197000	140000	112500	449500
14	Sohan Nadi	168-75-00	1328900	949000	759000	30,36,900
15	**Total**	**534-75-00**	**4181900**	**3002000**	**2400000**	**9583900**

Pie Digramme No. 7 Showing %age wise Mineral Potentials (in metric tones) in Sohan Nadi and its Tributaries , District Una



Graph No.-25 Showing Mineral Potential (in metric Tonnes) in Sohan nadi and its Tributaries in District Una



11.9 Mineral Potential in Satluj River and its Tributaries

11.9.a Swan (Soan) river and its Tributaries

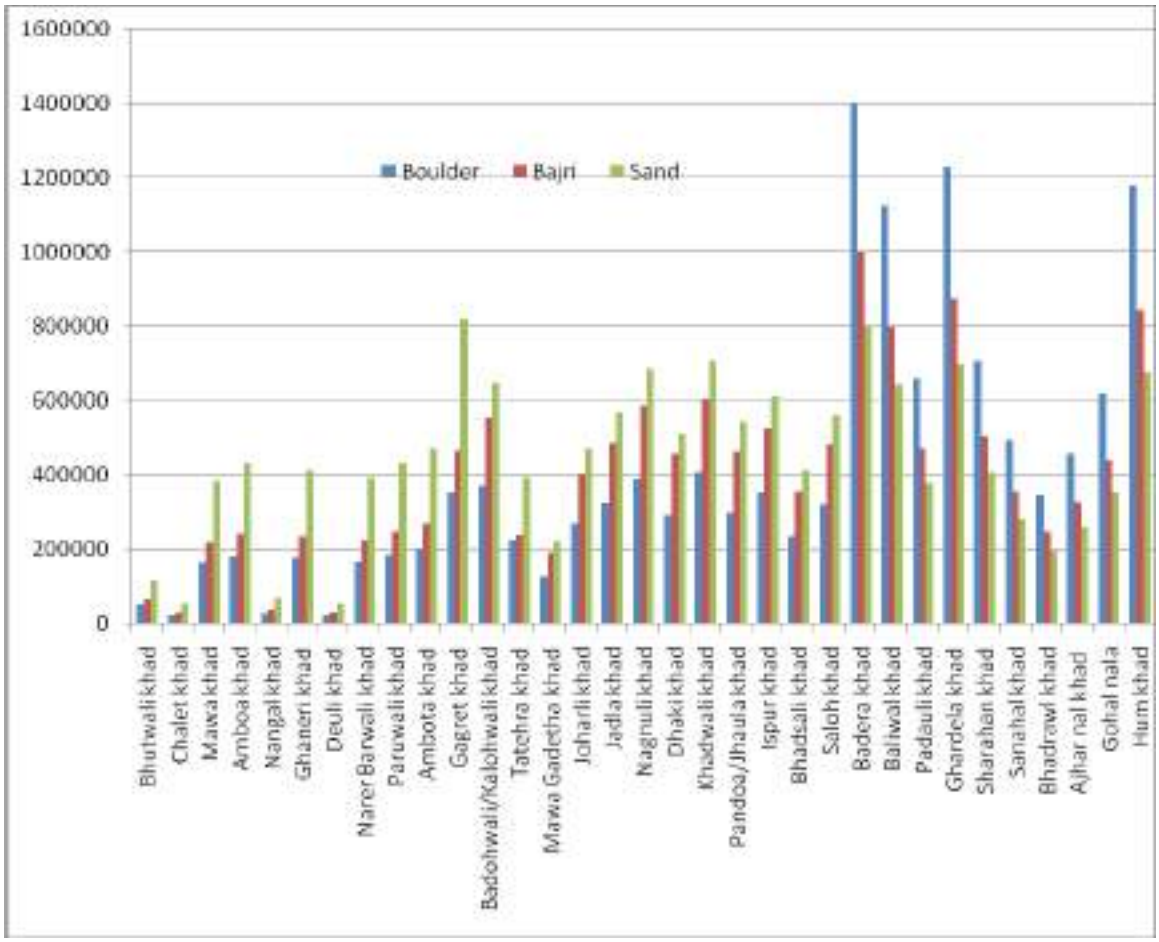
Table No.-19 Showing River bed area and Mineral potential in Swan (Soanriver) river and its Tributaries

S.no	Name of River	River bed area (in hectare)	Mineral potential in metric tonnes			
			Boulder	Bazri	Sand	Total
	Right Bank					
1	Bhutwali khad	15-00-00	50,000	67,000	1,18,000	2,35,000
2	Chalet khad	7-00-00	23,000	31,000	55,000	1,09,000
3	Mawa khad	49-00-00	1,65,000	2,20,000	3,85,000	7,70,000
4	Amboa khad	53-75-00	1,81,000	2,42,000	4,33,000	8,45,000
5	Nangal khad	8-75-00	29.000	39,000	69,000	1,37,000
6	Ghaneri khad	52-50-00	1,77.000	2,36,000	4,13,000	8,26,000
7	Deuli khad	7-00-00	23,000	31,000	55,000	1,09,000
8	Narer Barwali khad	50-00-00	1,68,000	2,25,000	3,93,000	7,86,000
9	Paruwali khad	55-00-00	1,85,000	2,47,000	4,33,000	8,65,000
10	Ambota khad	60-00-00	2,00,000	2,70,000	4,72,000	9,42,000
11	Gagret khad	104-00-00	3,51,000	4,68,000	8,19,000	16,38,000
12	Badohwali/Kaloh	82-50-00	3,71,000	5,56,000	6,49,000	15,76,000

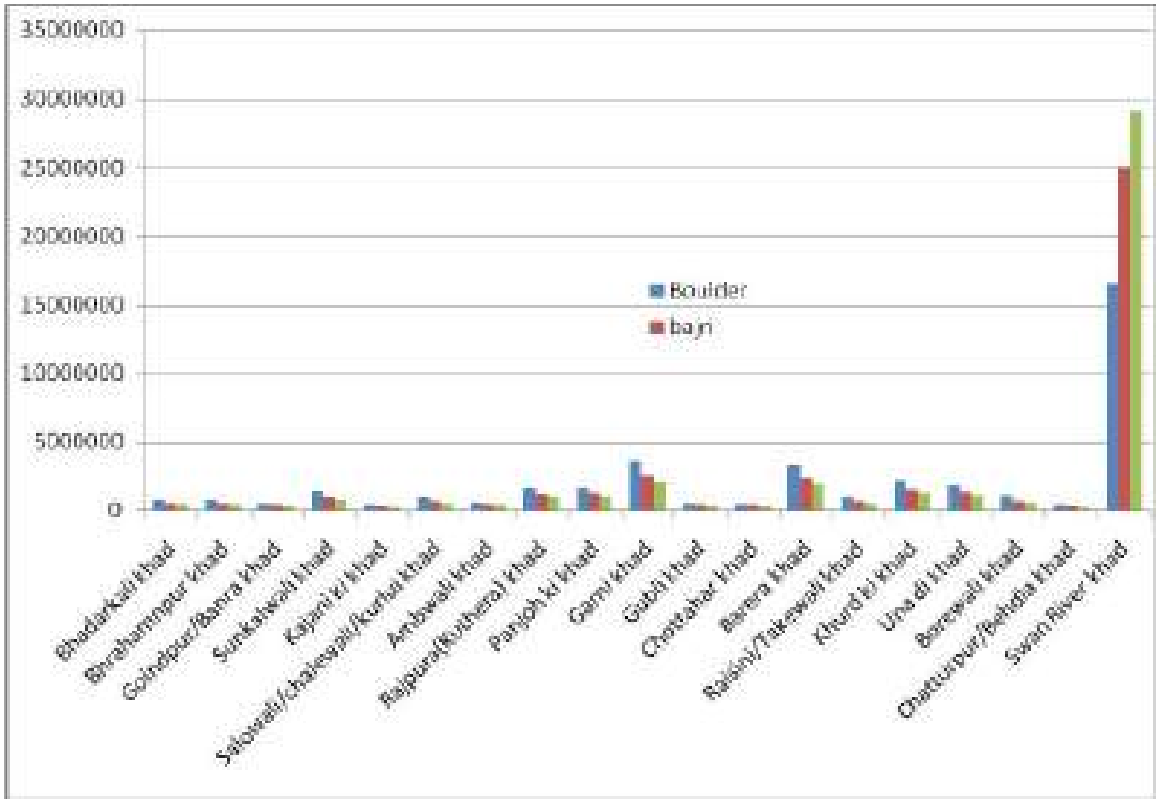
	wali khad					
13	Tatehra khad	50-00-00	2,25,000	2,37,000	3,93,000	8,55,000
14	Mawa Gadetha khad	28-00-00	1,26,000	1,89,000	2,21,000	5,36,000
15	Joharli khad	60-00-00	2,70,000	4,00,000	4,72,000	11,42,000
16	Jadla khad	72-00-00	3,24,000	4,86,000	5,67,000	13,77,000
17	Nagnuli khad	87-50-00	3,91,000	5,87,000	6,85,000	16,63,000
18	Dhaki khad	65-00-00	2,92,000	4,58,000	5,11,000	12,61,000
19	Khadwali khad	90-00-00	4,05,000	6,07,000	7,08,000	17,20,000
20	Pandoa/Jhaula khad	69-00-00	3,00,000	4,65,000	5,43,000	13,08,000
21	Ispur khad	78-00-00	3,51,000	5,26,000	6,14,000	14,91,000
22	Bhadsali khad	52-50-00	2,36,000	3,54,000	4,13,000	10,03,000
23	Saloh khad	71-50-00	3,21,000	4,82,000	563000	1366000
24	Badera khad	180-00-00	1400000	1000000	800000	3200000
25	Baliwal khad	143-00-00	1126000	800000	643000	2569000
26	Padauli khad	84-00-00	661000	472000	378000	1511000
27	Ghardela khad	156-00-00	1228000	877000	700000	2805000
28	Sharahan khad	90-00-00	708000	506000	405000	1619000
29	Sanahal khad	63-00-00	496000	354000	283000	1133000
30	Bhadrawl khad	44-00-00	346000	247000	198000	791000
31	Ajhar nal khad	58-00-00	456000	326000	261000	1043000
32	Gohal nala	78-50-00	618000	441000	353000	1412000
33	Hum khad	150-00-00	1181000	843000	675000	2699000
	Left Bank					
34	Bhadarkali khad	96-00-00	756000	540000	432000	1728000
35	Bhrahamnpur khad	95-00-00	748000	534000	427000	1709000
36	Goindpur/Banra khad	66-00-00	519000	371000	297000	1187000
37	Sunkalwali khad	175-00-00	1378000	984000	787000	3149000
38	Kajani ki khad	46-00-00	362000	258000	200000	820000
39	Salowali/chalewa li/kurlui khad	120-00-00	945000	675000	540000	260000
40	Ambwali khad	77-00-00	600000	433000	346000	1379000
41	Rajpura(Kuthera) khad	202-50-00	1594000	1139000	911000	3644000
42	Panjoh ki khad	210-00-00	1653000	1181000	945000	3779000
43	Garni khad	450-00-00	3543000	2531000	2025000	8099000
44	Gubli khad	66-00-00	519000	371000	297000	1187000
45	Chottahar khad	60-00-00	472000	337000	270000	1079000
46	Barera khad	420-00-00	3300000	2362000	1890000	7552000
47	Raisini/Takewali khad	117-00-00	921000	658000	526000	2105000
48	Khurd ki khad	270-00-00	2126000	1518000	1215000	4859000
49	Una di khad	225-00-00	1771000	1265000	1012000	4048000
50	Borewali khad	126-00-00	992000	708000	567000	2267000

51	Chatturpur/Behdla khad	46-00-00	362000	258000	200000	820000
52	Swan River	3700-00-00	16600000	24900000	29100000	70600000

Graph No.-26 Showing Mineral Potential In the Tributaries on Right Bank of Swan river



Graph No-27 Showing Mineral Potential (IN METRIC TONNES) in Swan river and its Tributaries Joining on Left Bank

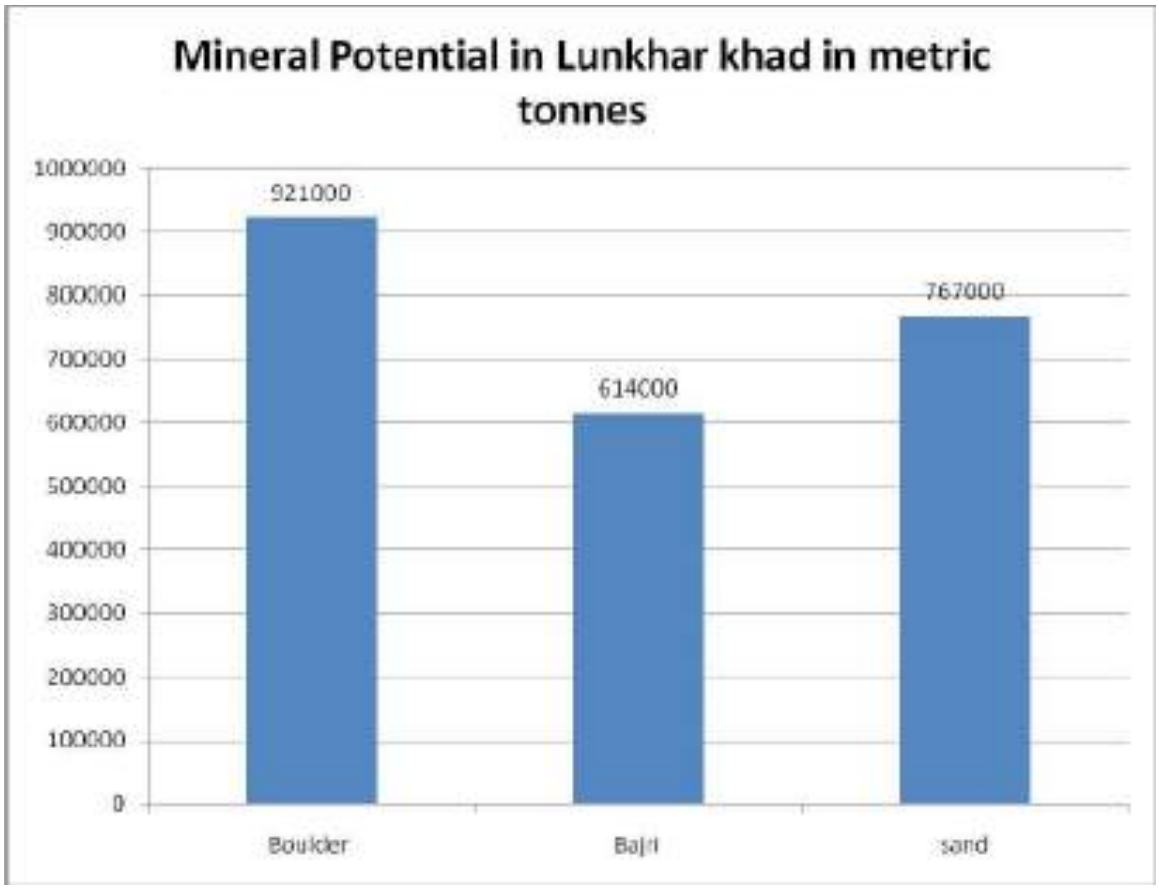


11.9.b Lunkhar Khad

Table No.-20 Showing River bed area and Mineral potential in Lunkhar khad

Sr No,	Name of tributary	River bed area in hectares	Mineral potential in metric tonnes			
			Boulder	Bajri	Sand	**Total**
1	Lunkhar khad	136-50-00	921000	614000	767000	2302000

Graph No.-28 Showing Mineral Potential in the Lunkhar Khad in Metric tonnes

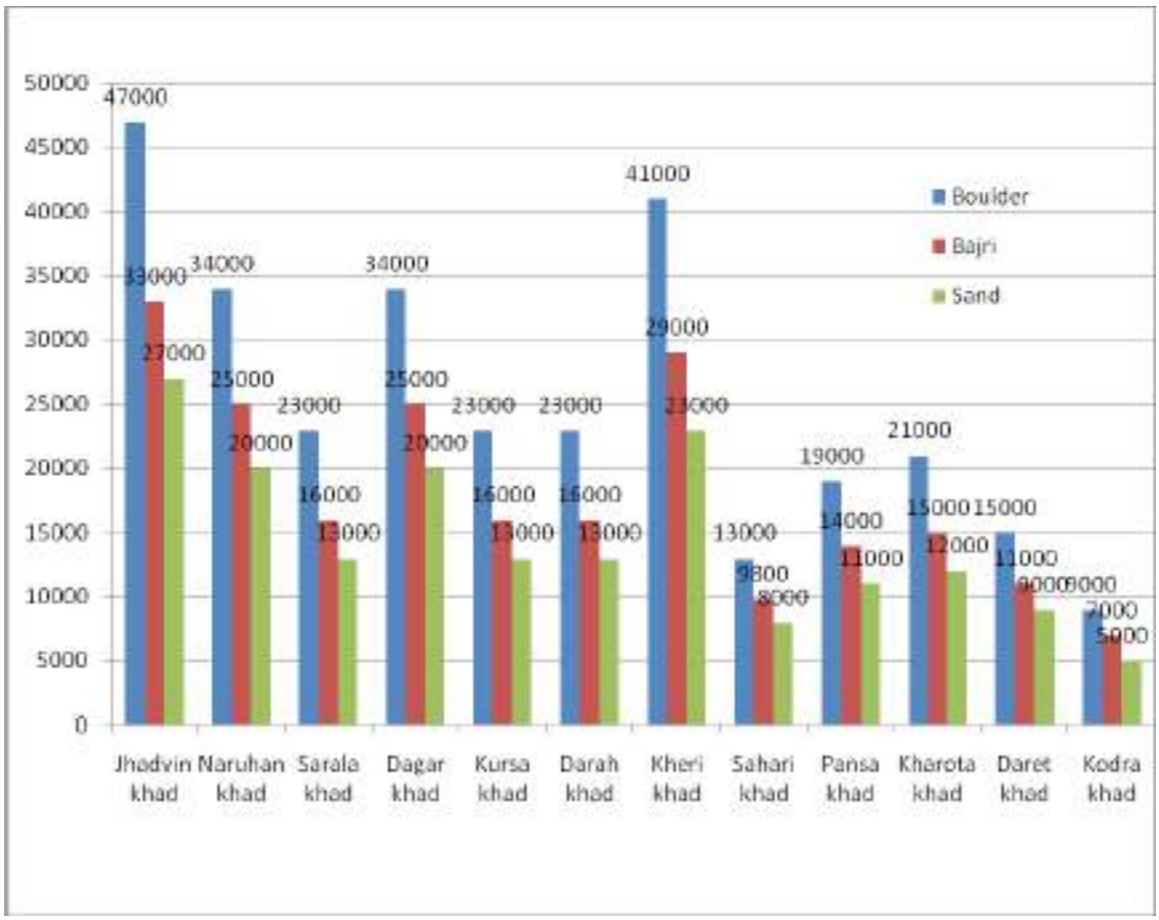


11.9.c Mineral Potential in Streams Draining into Govindsagar

Table-21 Showing River bed area and Mineral potential in streams draining into Govindsagar

Sr No,	Name of tributary	River bed area in hectares	Mineral potential in metric tonnes			
			Boulder	Bajri	sand	**Total**
Left Bank						
1	Jhadvin khad	6-00-00	47000	33000	27000	107000
2	Naruhan khad	4-50-00	34000	25000	20000	79000
3	Sarala khad	3-00-00	23000	16000	13000	52000
4	Dagar khad	4-50-00	34000	25000	20000	79000
5	Kursa khad	3-00-00	23000	16000	13000	52000
6	Darah khad	3-00-00	23000	16000	13000	52000
7	Kheri khad	5-25-00	41000	29000	23000	93000
8	Sahari khad	1-75-00	13000	9800	8000	30800
9	Pansa khad	2-50-00	19000	14000	11000	44000
10	Kharota khad	2-70-00	21000	15000	12000	48000
11	Daret khad	2-00-00	15000	11000	9000	35000
12	Kodra khad	1--25--00	9000	7000	5000	21000
Right Bank						
13	Chaprot khad	3-00-00	23000	16000	13000	52000
14	Dhuk khad	1-75-00	13000	9800	8000	30800
15	Kolka khad	2-50-00	19000	14000	11000	44000
16	Raipur khad	1-75-00	13000	9800	8000	30800
17	Dober khad	3-50-00	27000	19000	15000	61000
18	Chaukat khad	1-00-00	7000	5000	4000	16000
	Total	54-95-00	404000	290400	233000	927400

Graph No.-29 Showing Mineral Potential in the streams draining into Govindsagar

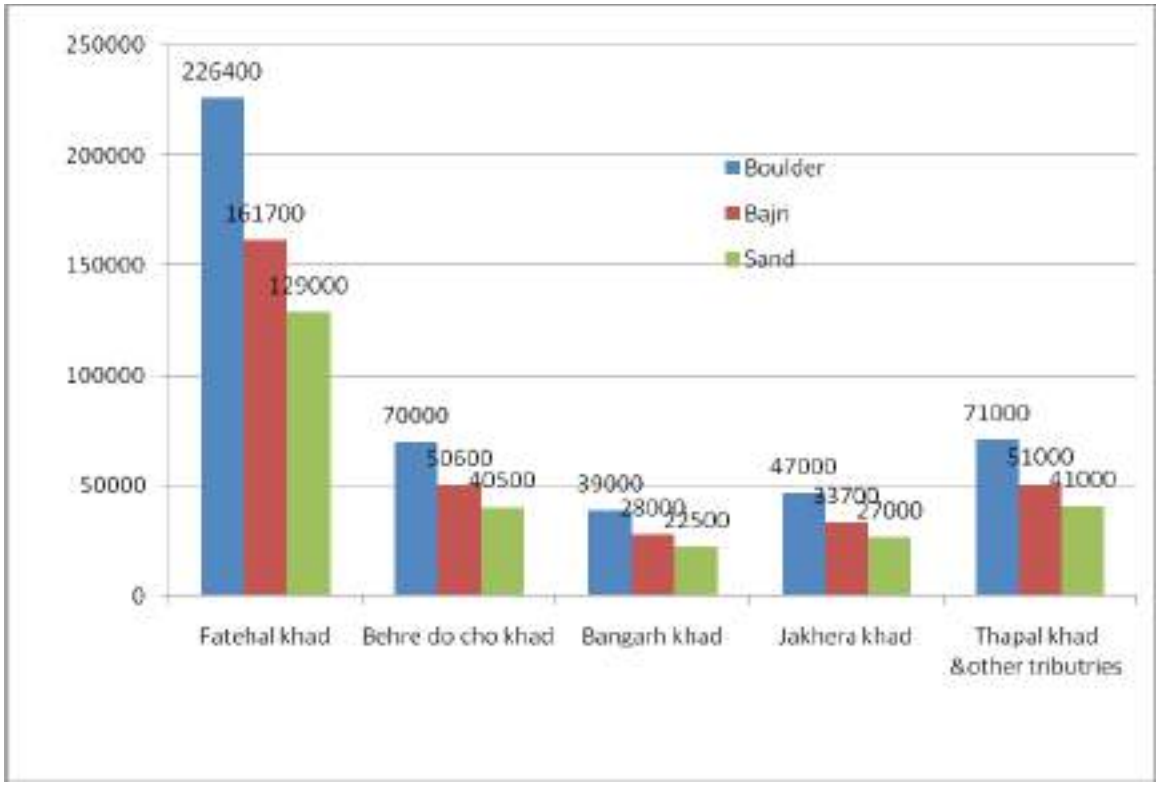


11.9.d Streams flowing into Satluj between Bhakra Dam and Nangal :-

Table No. -22 Showing River bed area and Mineral potential in streams flowing into Satluj between Bhakra and Nangal dam

S.no	Name of River	River bed area (in hectares)	Mineral potential (in metric tones)			Total
			Boulder	Bajri	Sand	
1	Fatehal khad	28-75-00	2,26,400	1,61,700	1,29,000	5,17,100
2	Behre do cho khad	9-00-00	70,000	50,600	40,500	1,61,100
3	Bangarh khad	5-00-00	39,000	28,000	22,500	89,500
4	Jakhera khad	6-00-00	47,000	33,700	27,000	1,07,700
5	Thapal khad &other tributries	9-00-00	71,000	51,000	41,000	1,63,000
	Total	57-75-00	4,53,400	3,25,000	2,60,000	10,38,400

Graph-30 Mineral Potentials in Streams flowing into Satluj between Bahkra Dam and Nangal

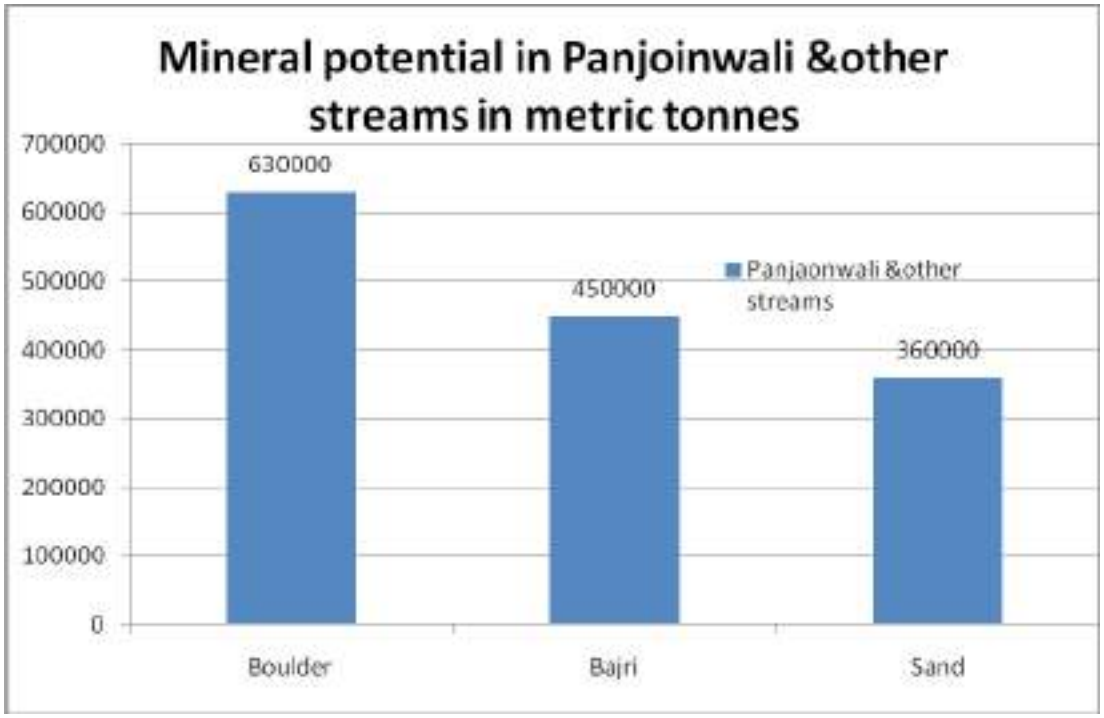


11.9.e Mineral Potentials of Panjoiwala Khad

Table No -23 Showing River bed area and Mineral potential of Panjoiwala khad

Sr No,	Name of tributary	River bed area in hectares	Mineral potential in metric tonnes			
			Boulder	Bajri	Sand	**Total**
1	Panjaonwali &other streams	80-00-00	630000	450000	360000	1440000

Graph No.-31 Showing Mineral Potential In Panjoinwala & Other Streams in Metric Tonnes



11.10 Annual Deposition

As already explained that during flood, the stream carries sediments comprising different componenet as per the lithlogy forming the catchment and these sediments are deposited in the bed of stream annually. This deposition during one year is known as the annual deposition. The deposition in a river bed is more pronounced during rainy season although the quantum of deposition varies from stream to stream depending upon numbers of factors such as catchment lithology, discharge, river profile and geomorphology of the river course. The particle size may vary depending upon the stage of river i.e. youth, mature and old age. In Una District during field survey it is observed that annual deposition in various streams vary from 3 cms to 8 cms. However there are certain geomorphological features developed in the river bed such as channel bars, point bars etc. where annual deposition is much more even two to three metres. The annual deposition in tributaries of Beas and satluj river are calculated and the annual mineral deposition is as under:-

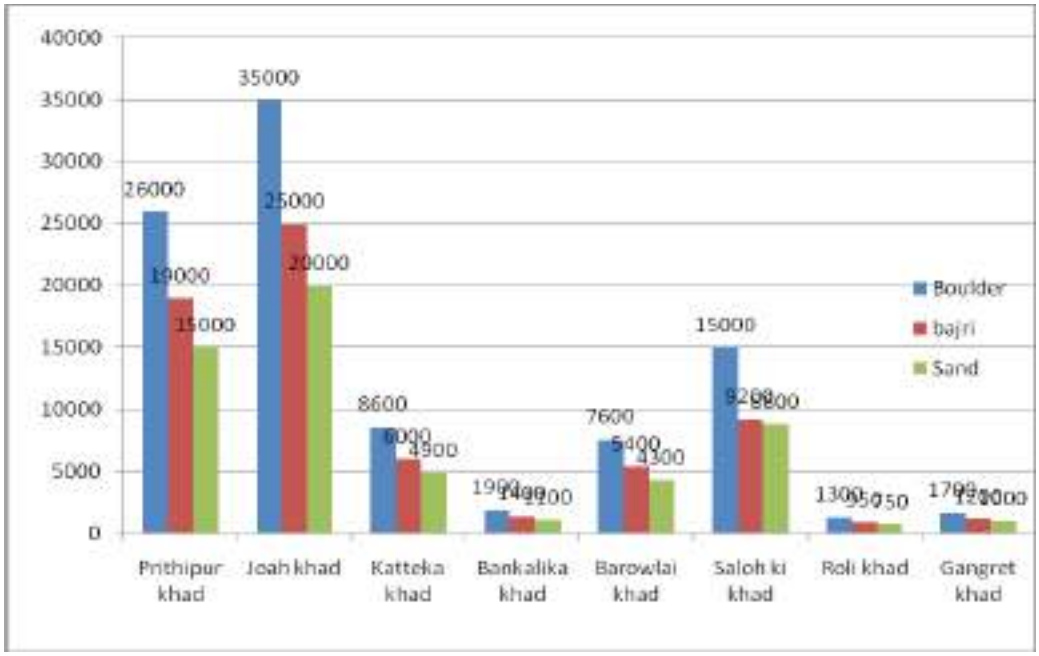
11.10.a Annual Deposition in Beas River Tributaries

Sohan Nadi and its tributaries

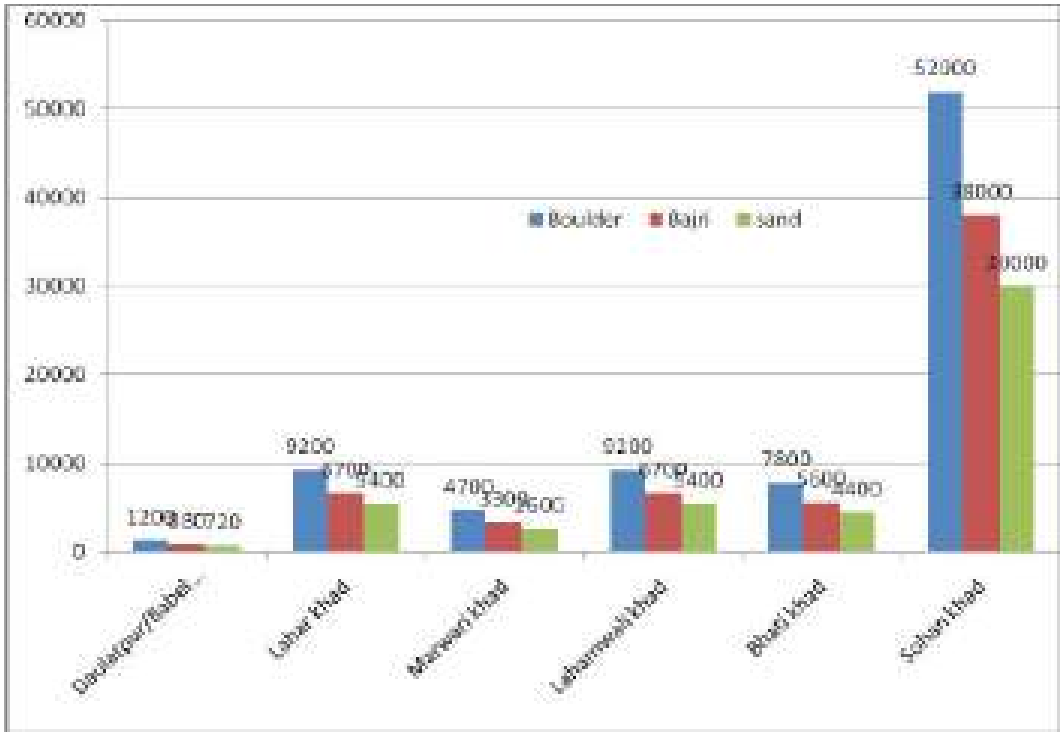
Table No -24 Showing River bed area and Annual deposition (in metric tonnes) in Sohan Nadi and its Tributaries

Sr No,	Name of tributary	River bed area in hectares	Mineral potential in metric tonnes			Total mineral potential in metric tonnes
			Boulder	Bajri	sand	
Right Bank						
1	Prithipur khad	67-50-00	26000	19000	15000	60000
2	Joah khad	90-00-00	35000	25000	20000	80000
3	Katteka khad	22-00-00	8600	6000	4900	19500
4	Bankalika khad	5-00-00	1900	1400	1100	4400
5	Barowlai khad	19-50-00	7600	5400	4300	17300
6	Saloh ki khad	50-00-00	15000	9200	8800	33000
7	Roli khad	3-50-00	1300	950	750	3000
8	Gangret khad	4-50-00	1700	1200	1000	3900
Left Bank						
9	Daulatpur/Babel khad	4-00-00	1200	880	720	2800
10	Lahar khad	30-00-00	9200	6700	5400	21300
11	Marwari khad	15-00-00	4700	3300	2600	10600
12	Laharnwali khad	30-00-00	9200	6700	5400	21300
13	Bhati khad	25-00-00	7800	5600	4400	17800
14	Sohan Nadi	168-75-00	52000	38000	30000	120000
	Total	534-75-00	181200	129330	104370	414900

Graph No.-32 Showing Annual Mineral Deposition In the Right bank Tributaries of Sohan Nadi



Graph No,-33 Showing Annual Mineral Deposition (in metric tonnes) In Sohan Nadi and its Tributaries



11.10.b Annual Mineral Deposition in the river Bed of Satluj River Tributaries

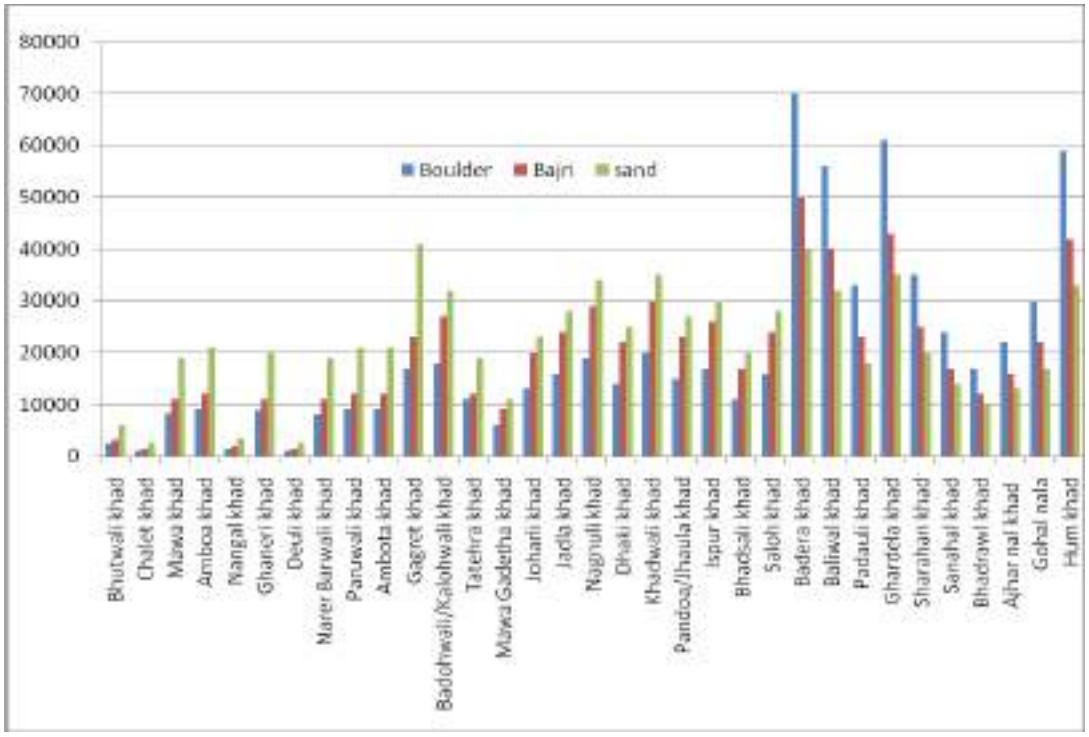
Annual Mineral Deposition in Swan (Soan) river and its Tributaries

Table No -25 Showing River bed area and Annual deposition in river bed of satluj river tributaries

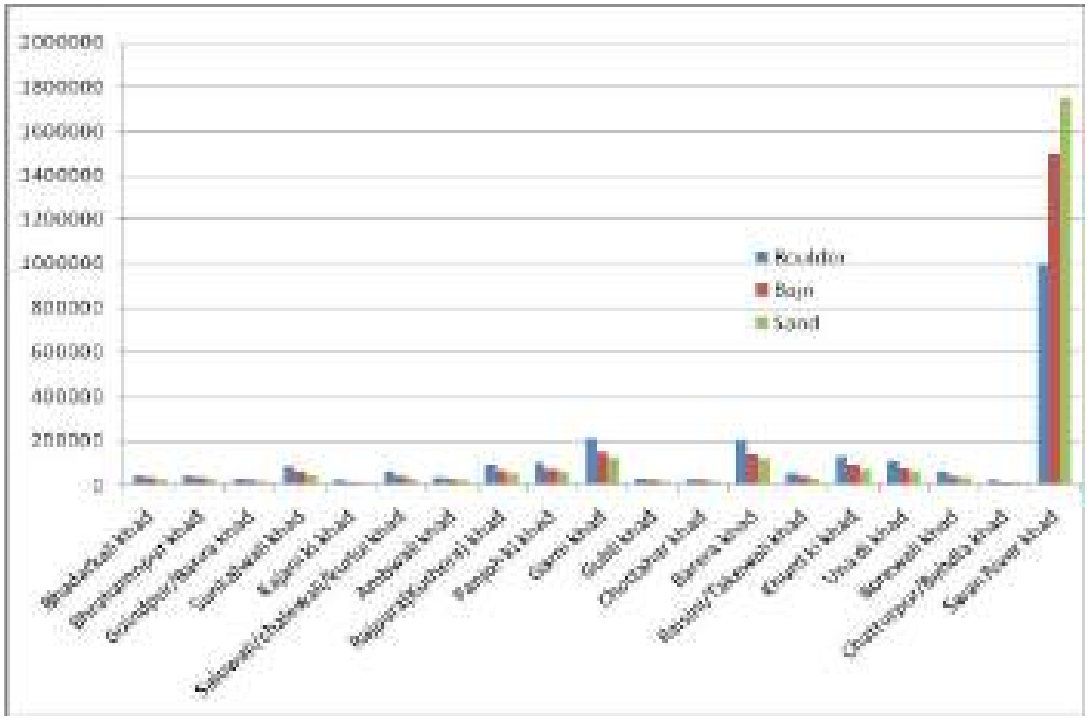
S.no	Name of River	Total area (in hectare)	Mineral Potential in metric tonnes			
			Boulder	Bazri	Sand	Total
1	Bhutwali khad	15-00-00	2500	3300	6000	11800
2	Chalet khad	7-00-00	1100	1500	2700	5300
3	Mawa khad	49-00-00	8200	11000	19000	38200
4	Amboa khad	53-75-00	9000	12000	21000	42000
5	Nangal khad	8-75-00	1400	1900	3400	6700
6	Ghaneri khad	52-50-00	8800	11000	20000	39800
7	Deuli khad	7-00-00	1100	1500	2700	5300
8	Narer Barwali khad	50-00-00	8000	11000	19000	38000
9	Paruwali khad	55-00-00	9000	12000	21000	42000
10	Ambota khad	60-00-00	9000	12000	21000	42000
11	Gagret khad	104-00-00	17000	23000	41000	81000
12	Badohwali/Kalohwali khad	82-50-00	18000	27000	32000	77000
13	Tatehra khad	50-00-00	11000	12000	19000	42000
14	Mawa Gadetha khad	28-00-00	6000	9000	11000	26000
15	Joharli khad	60-00-00	13000	20000	23000	56000
16	Jadla khad	72-00-00	16000	24000	28000	68000
17	Nagnuli khad	87-50-00	19000	29000	34000	82000
18	Dhaki khad	65-00-00	14000	22000	25000	61000
19	Khadwali khad	90-00-00	20000	30000	35000	85000
20	Pandoa/Jhaula khad	69-00-00	15000	23000	27000	65000
21	Ispur khad	78-00-00	17000	26000	30000	73000
22	Bhadsali khad	52-50-00	11000	17000	20000	48000
23	Saloh khad	71-50-00	16000	24000	28000	68000
24	Badera khad	180-00-00	70000	50000	40000	160000
25	Baliwal khad	143-00-00	56000	40000	32000	128000
26	Padauli khad	84-00-00	33000	23000	18000	74000
27	Ghardela khad	156-00-00	61000	43000	35000	139000
28	Sharahan khad	90-00-00	35000	25000	20000	80000
29	Sanahal khad	63-00-00	24000	17000	14000	55000
30	Bhadrawl khad	44-00-00	17000	12000	10000	39000
31	Ajhar nal khad	58-00-00	22000	16000	13000	51000
32	Gohal nala	78-50-00	30000	22000	17000	69000
33	Hum khad	150-00-00	59000	42000	33000	134000
	Sub-total	**2314-50-00**	**658100**	**653200**	**720300**	**2032100**
34	Bhadarkali khad	96-00-00	45000	37000	26000	108000

35	Bhrahamnpur khad	95-00-00	45000	37000	26000	103000
36	Goindpur/Banra khad	66-00-00	31000	22000	18000	71000
37	Sunkalwali khad	175-00-00	82000	59000	47000	188000
38	Kajani ki khad	46-00-00	22000	15000	12000	49000
39	Salowali/chalewali/kurlui khad	120-00-00	56000	40000	32000	128000
40	Ambwali khad	77-00-00	36000	26000	21000	83000
41	Rajpura(Kuthera) khad	202-50-00	95000	68000	54000	217000
42	Panjoh ki khad	210-00-00	99000	71000	56000	226000
43	Garni khad	450-00-00	212000	151000	121000	484000
44	Gubli khad	66-00-00	31000	22000	18000	71000
45	Chottahar khad	60-00-00	28000	20000	16000	64000
46	Barera khad	420-00-00	198000	141000	113000	452000
47	Raisini/Takewali khad	117-00-00	55000	38000	31000	124000
48	Khurd ki khad	270-00-00	127000	91000	73000	291000
49	Una di khad	225-00-00	106000	75000	60000	241000
50	Borewali khad	126-00-00	59000	42000	34000	135000
51	Chatturpur/Behdla khad	46-00-00	22000	15000	12000	49000
52	Swan River khad	3700-00-00	996000	1494000	1746000	4236000
	Total		2345000	2464000	2516000	7325000

Graph No.-34 Showing Annual Mineral Deposition (in metric tonnes)in River Bed of right Bank tributaries of Swan river



Graph No.-35 Showing Annual Mineral Deposition in Swan river and its Left Bank tributaries (in metric tonnes

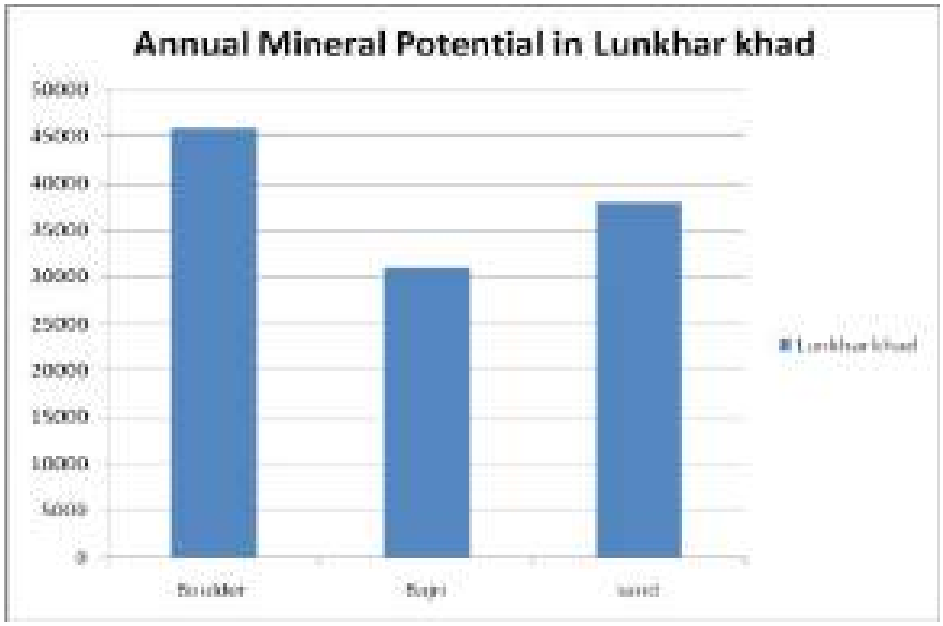


11.10.c Annual Deposition in Lunkhar khad

Table No -26 Showing River bed area and Annual deposition in Lunkhar khad

Sr No,	Name of tributary	River bed area in hectares	Mineral potentials in metric tonnes			
			Boulder	Bajri	sand	**Total**
1	Lunkhar khad	136-50-00	46000	31000	38000	115000
2						

Graph No.-36 Showing Annual Mineral Deposition in River Bed of Lunkhar Khad (in metric tonnes)



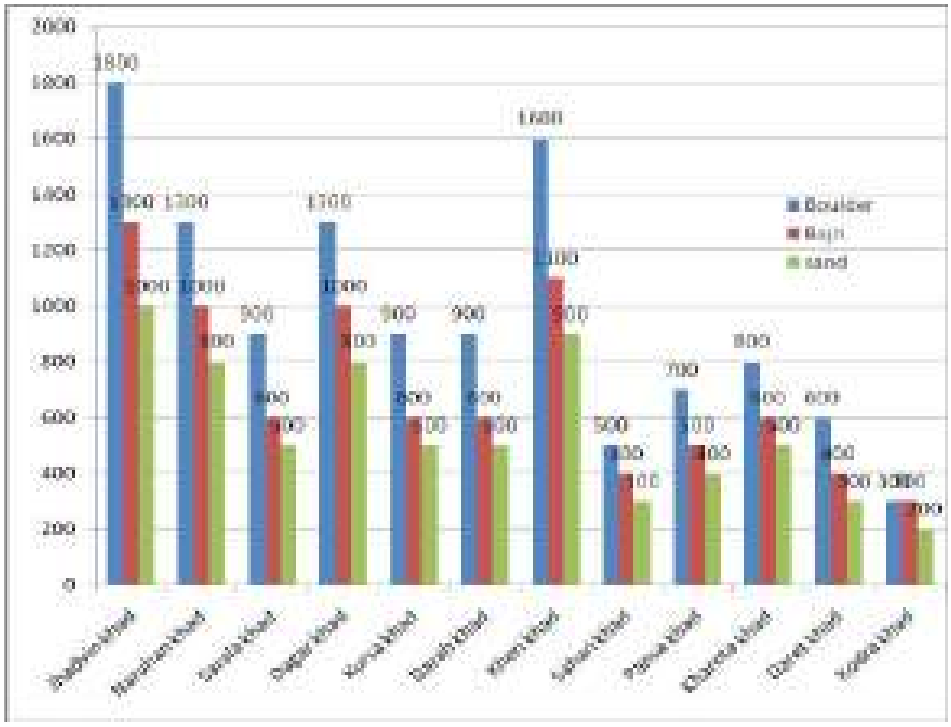
11.10.d Annual Deposition in streams Draining into Govindsagar

Table No -27 Showing River bed area and Annual deposition in streams draining into GovindSagar

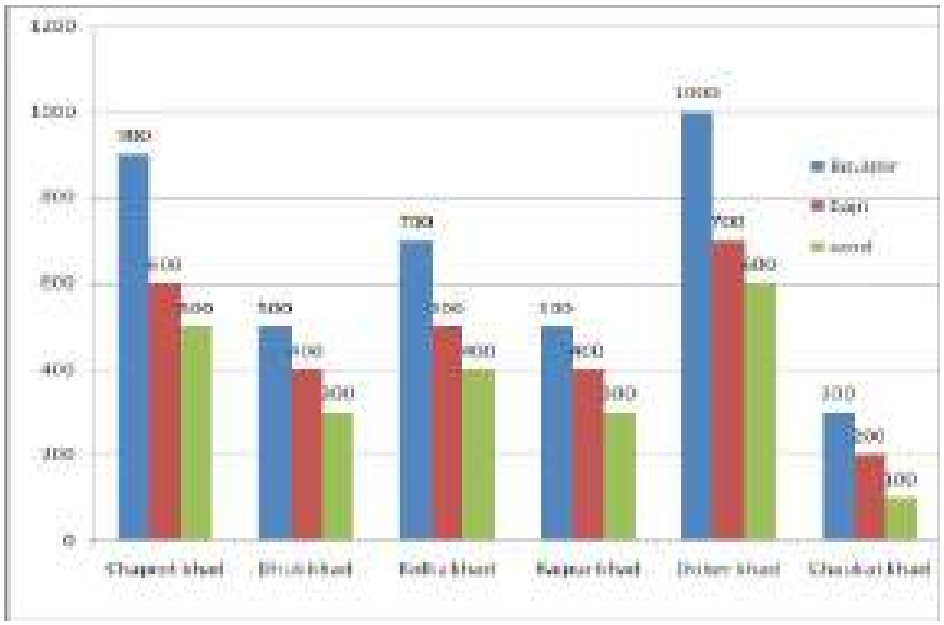
Sr No,	Name of tributary	River bed area in hectares	Mineral potentials in metric tonnes			
			Boulder	Bajri	sand	**Total**
Left Bank						
1	Jhadvin khad	6-00-00	1800	1300	1000	4100
2	Naruhan khad	4-50-00	1300	1000	800	3100

3	Sarala khad	3-00-00	900	600	500	2000
4	Dagar khad	4-50-00	1300	1000	800	3100
5	Kursa khad	3-00-00	900	600	500	2000
6	Darah khad	3-00-00	900	600	500	2000
7	Kheri khad	5-25-00	1600	1100	900	3600
8	Sahari khad	1-75-00	500	400	300	1200
9	Pansa khad	2-50-00	700	500	400	1600
10	Kharota khad	2-70-00	800	600	500	1900
11	Daret khad	2-00-00	600	400	300	1300
12	Kodra khad	1--25--00	300	300	200	800
Right Bank						
13	Chaprot khad	3-00-00	900	600	500	2000
14	Dhuk khad	1-75-00	500	400	300	1200
15	Kolka khad	2-50-00	700	500	400	1600
16	Raipur khad	1-75-00	500	400	300	1200
17	Dober khad	3-50-00	1000	700	600	2300
18	Chaukat khad	1-00-00	300	200	100	600
	Total	**54-95-00**	**15500**	**11200**	**8900**	**35600**

Graph No. -37 Showing Annual Mineral Deposition in River Bed of streams Draining into Govindsagar on Left Bank (in metric tonnes)



Graph No.-38 Showing Annual Mineral Deposition in River Bed of streams Draining into Govindsagar on Right bank (in metric tonnes)

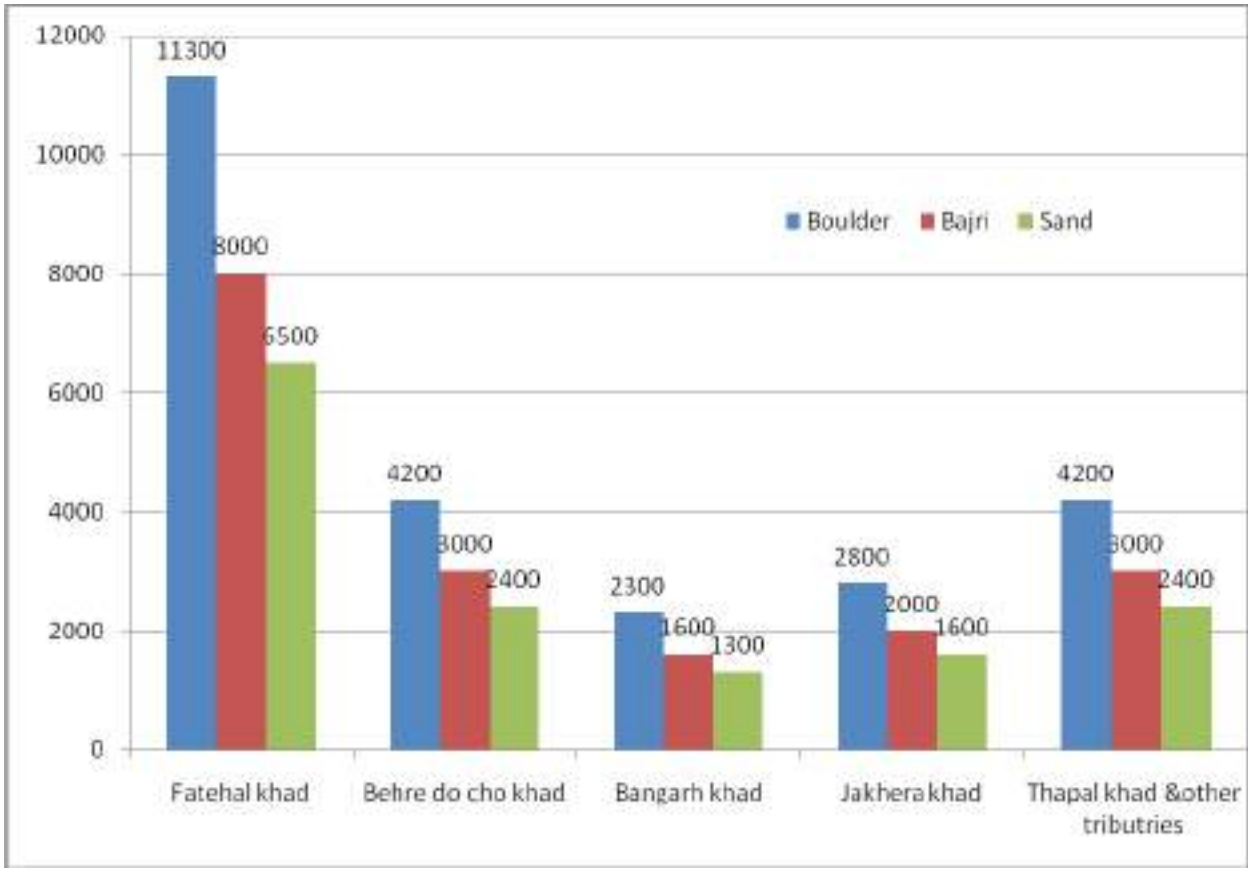


11.10.e Annual Deposition in Streams Flowing Into Satluj Between Bhakra Dam and Nangal

Table No -28 Showing River bed area and Annual deposition in streams flowing into Satluj between Bhakra Dam and Nangal

S.no	Name of River	River bed area (in hectares)	Annual Deposition (in metric tones)			Total
			Boulder	Bajri	Sand	
1	Fatehal khad	28-75-00	11300	8000	6500	25800
2	Behre do cho khad	9-00-00	4200	3000	2400	9600
3	Bangarh khad	5-00-00	2300	1600	1300	5200
4	Jakhera khad	6-00-00	2800	2000	1600	6400
5	Thapal khad &other tributries	9-00-00	4200	3000	2400	9600
6		**57-75-00**	24800	17600	14200	56600

Graph No.-39 Showing Annual Mineral Deposition (in metric Tonnes) in River Bed of streams Flowing into Satluj between Bhakra Dam and Nangal

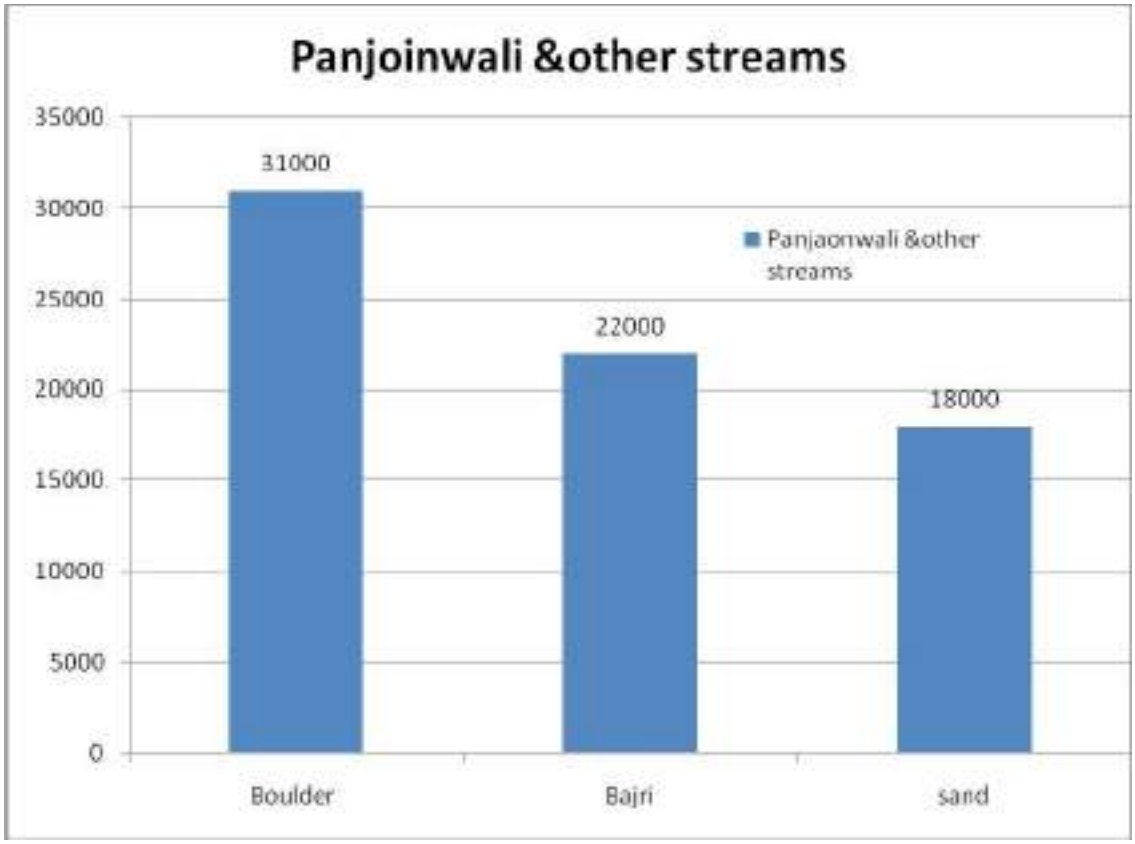


11.10.f Annual Deposition in Panjoiwala Khad

Table No -29 Showing River bed area and Annual deposition in Panjoiwala khad

Sr No,	Name of tributary	River bed area in hectares	Mineral potentials in metric tonnes			
			Boulder	Bajri	sand	**Total**
1	Panjoinwali &other streams	80-00-00	31000	22000	18000	71000
2						

Graph No.-40 Showing Annual Mineral Deposition (in metric Tonnes) in River Bed of streams Flowing Into Satluj Between Bhakra Dam and Nangal



12.0 Catchmentwise Mineral Potential

Table No, 30: Showing Catchmentwise mineral deposit

Sr No,	Name of tributary	Boulder In metric Tonnes	Bajri In metric Tonnes	Sand In metric Tonnes	Total mineral potential in metric tonnes
1	Sohan Nadi catchment	4181900	3002000	2400000	9583900
2	Swan River Catchment	16600000	24900000	29100000	70600000
3	Lunkhar Khad Catchment	921000	614000	767000	2302000
4	Streams draining into GovindSagar	404000	290400	233000	927400
5	Streams flowing into Satluj between	453400	325000	260000	1038400

	Bhakra and Nangal				
6	Panjoinwala Khad and other streams	630000	450000	360000	1440000
	Total	23190300	29581400	33120000	85891700

Table No, 31: Showing Catchmentwise Annual Mineral deposit

Sr No,	Name of river/stream	Boulder in metric Tonnes	Bajri In metric Tonnes	Sand In metric Tonnes	Total mineral potential in metric tonnes
1	Sohan nadi	181200	129330	104370	414900
2	Swan River Catchment	2345000	2464000	2516000	7325000
3	Lunkhar Khad Catchment	46000	31000	38000	115000
4	Streams draining into GovindSagar	**15500**	**11200**	**8900**	**35600**
5	Streams flowing into Satluj between Bhakra and Nangal	24800	17600	14200	56600
6	Panjoinwala Khad and other streams	31000	22000	18000	71000
	Total	2643500	2675130	2699470	8018100

13.0 Recommendations

Based on Geo-Morphological factor such as length of stream, catchment area, River bed area, lithology of catchment, mineral potential, annual deposition, present production pattern, in each stream, the streams have either been recommended for mineral concession or prohibited for mineral concession. The streamwise recommendations are as under:-

13.1 Beas Catchment

Table No -32 Showing recommendations for Sohan nadi and its Tributaries

Sr No,	Name of tributary	From – to	**Recommendation**
Sohan Nadi			

Right Bank			
1	Pirthipur khad	From origin to village Pirthipur From Pirthipur village to confluence with Sohan nadi	No mineral concession Recommended for mineral concession
2	Joh khad	From origin to Joh village From Joh village to confluence with Sohan nadi	No mineral concession Recommended for mineral concession
3	Katteka khad	From origin to confluence with Sohan nadi	No mineral concession
4	Bankalika khad	From origin to confluence with Sohan nadi	No mineral concession
5	Barowlai khad	From origin to confluence with Sohan nadi	No mineral concession
6	Saloh ki khad	From origin to confluence with Soan river	No mineral concession
7	Roli khad	From origin to confluence with Sohan nadi	No mineral concession
8	Gangret khad	From origin to confluence with Sohan nadi	No mineral concession
Left bank			
9	Daulatpur/Babel khad	From origin to confluence with Sohan nadi	No mineral concession
10	Nand Ka Lahr khad	From origin to confluence with Soan nadi	No mineral concession
11	Marwari khad	From origin to confluence with Sohan nadi	No mineral concession
12	Lahranwali khad	From origin to confluence with Soan nadi	No mineral concession
13	Bhati khad	From origin to confluence with Sohan nadi	No mineral concession
14	Sohan nadi	From origin to confluence with Joh Khad From Joh khad confluence to Punjab border	No mineral concession Recommended for mineral concession

13.2 Satluj Catchment
Recommendations for Swan (Soan) river and its Tributaries

Table-33 Showing recommendations for Swan riverand its Tributaries

S.no	Name of River	From--To	Recommendations
	Swan River		
	Right Bank		
1	Bhutwali khad	From origin to confluence with Swan river	No mineral concession
2	Chalet khad	From origin to Daulatpur –Gagret road From Daulatpur –Gagret road to confluence with Swan river	No mineral concession Recommended for mineral concession
3	Mawa khad	From origin to Daulatpur –Gagret road From Daulatpur –Gagret road to confluence with Swan river	No Mineral concession Recommended for mineral concession
4	Amboa khad	From origin to confluence with Swan river	Recommended for mineral concession
5	Nangal khad (Jariala)	From origin to confluence with Swan river	Recommended for mineral concession
6	Ghaneri khad	From origin to confluence with Swan river	No Mineral concession
7	Deuli khad	From origin to confluence with Swan river	No Mineral concession
8	Narer Barwali khad	From origin to confluence with Swan river	No Mineral concession
9	Paruwali khad	From origin to Daulatpur –Gagret road From Daulatpur –Gagret road to confluence with Swan river	No Mineral concession Recommended for mineral concession
10	Ambota khad	From origin to Ambota village From Ambota village to confluence with Swan river	No Mineral concession Recommended for mineral concession
11	Gagret khad	From origin to confluence with Swan river	No Mineral concession
12	Badohwali/ Kalohwali	From origin to Ratti Khan	No Mineral concession

	khad	From Ratti Khan to confluence with Swan river	Recommended for mineral concession
13	Tatehra khad	From origin to confluence with Swan river	No Mineral concession
14	Mawa Gadetha khad	From origin to confluence with Swan river	No Mineral concession
15	Loharli khad	From origin to confluence with Swan river	Recommended for mineral concession
16	Jadla khad	From origin to confluence with Swan river	No Mineral concession
17	Nagnuli khad	From origin to confluence with Swan river	No Mineral concession
18	Dhaki khad	From origin to confluence with Swan river	No Mineral concession
19	Khadwali khad	From origin to confluence with Swan river	Recommended for Mineral concession
20	Pandoa/Jhaula khad	From origin to confluence with Swan river	Recommended for Mineral concession
21	Ispur khad	From origin to Ispur village From Ispur village to confluence with Swan river	No mineral concession R Recommended for Mineral concession
22	Bhadsali khad	From origin to confluence with Swan river	No Mineral concession
23	Saloh khad	From origin to confluence with Swan river	No Mineral concession
24	Badehra khad	From origin to confluence with Swan river	Recommended for Mineral concession
25	Baliwal khad	From origin to confluence with Swan river	No mineral concession
26	Padauri khad	From origin to confluence with Swan river	No Mineral concession
27	Ghardala khad (Palkhawa Khad)	From origin to Pubowal From Pubowal to confluence with Swan river	No Mineral concession Recommended for Mineral concession
28	Sharahan khad	From origin to confluence with Swan river	Recommended for Mineral concession
29	Sanahal khad	From origin to confluence with Swan river	Recommended for Mineral concession
30	Bidorwal khad	From origin to confluence with Swan river	No Mineral concession

31	Ajhar nal khad	From origin to confluence with Swan river	No Mineral concession
32	Gohar and Seri nala	From origin to confluence with Swan river	Recommended for Mineral concession
33	Hum khad	From origin to Dolehar village From Dolehar village to confluence with Swan river including Goindpur and Bathu khad	No Mineral concession Recommended for Mineral concession
	Left Bank		
34	Bhadarkali khad	From origin to Bhadarkali From Bhadarkali to confluence with Swan river	No mineral concession Recommended for mineral concession
35	Bhrahamnpur khad	From origin to Fatehpur village From Fatehpur village to confluence with Swan river	No mineral concession Recommended for mineral concession
36	Goindpur/Banra khad	From origin to Kuthera Rampur From Kuthera Rampur to confluence with Swan river	No mineral concession Recommended for mineral concession
37	Sunkalwali khad	From origin to Nakro village From Nakro village to confluence with Swan river	No mineral concession Recommended for mineral concession
38	Kajani ki khad	From origin to Panjal vllage From Panjal village to confluence with Swan river	No mineral concession Recommended for mineral concession
39	Salowali/Chalerwali/Kalruhi khad	From origin to confluence with Chalerwali and Salohwali khad From confluence with Chalerwali and Salohwali khad to confluence with Swan river	No mineral concession Recommended for mineral concession
40	Ambwali khad	From origin to Amb From Amb to confluence with Swan river	No mineral concession Recommended for mineral

			concession
41	Rajpura(Kuthera) khad	From origin to Kuthera Khairla From Kuthera Khairla to confluence with Swan river	No mineral concession Recommended for mineral concession
42	Panjoa ki khad	From origin to confluence with Swan river	Recommended for mineral concession
43	Garni khad	From origin to confluence with Barian di Khad From Barian di Khad to confluence with Swan river	No Mineral concession Recommended for Mineral concession
44	Gubri khad (Dussara Khad)	From origin to Satothar village From Satothar village to confluence with Swan river	No Mineral concession Recommended for Mineral concession
45	Chotta har khad	From origin to Batuhi village From Batuhi village confluence with Soan river	No Mineral concession Recommended for Mineral concession
46	Barera khad (Basal Khad)	From origin to Sajhot village From Sajhot village to confluence with Swan river	No Mineral concession Recommended for Mineral concession
47	Raisiri/Takewali khad	From origin to Jhamber village From Jhamber village to confluence with Swan river	No Mineral concession Recommended for Mineral concession
48	Khurd ki khad	From origin to Sammur village From Sammur village to confluence with Swan river	No Mineral concession Recommended for Mineral concession
49	Una di khad	From origin to Madanpur From Madanpur to confluence with Swan river	No Mineral concession Recommended for Mineral concession
50	Borewali khad	From origin to Una Santokhgarh road (Tabba, JalGraun) From Una Santokhgarh road to	No Mineral concession

		cconfluence with Swan river	Recommended for Mineral concession
51	Chattarpur/Behdala khad	From origin to Fatehpur From Fatehpur to confluence with Swan river	No Mineral concession Recommended for Mineral concession
52	Swan River khad	From origin to Mawa Kahloon From Mawa Kahloon to Punjab border (Batu Bathri)	No mineral concession Recommended for mineral concession

13.3 Lunkhar khad

Table No -34 Showing recommendations for Lunkhar khad

Sr No,	Name of tributary	From--To	Recommendations
1	Lunkhar khad	From origin to Tamlet village From Tamlet village to confluence with Govind Sagar	No mineral oncession Recommended for mineral concession

13.4 Streams draining into Govindsagar

Table No.-35 Showing recommendations for streams draining into Govindsagar

Sr No,	Name of tributary	From--To	Recommendations
Streams draining into Govindsagar			
Left Bank			
1	Jhadvin khad	From origin to confluence with Govindsagar	No Mineral concession
2	Naruhan khad	From origin to confluence with Govindsagar	No Mineral concession
3	Sarala khad	From origin to confluence with Govindsagar	No Mineral concession
4	Daghar khad	From origin to confluence with Govindsagar	No Mineral concession
5	Kursa khad	From origin to confluence with Govindsagar	No Mineral concession
6	Darah khad	From origin to confluence with	No Mineral concession

		Govindsagar	
7	Kheri khad	From origin to confluence with Govindsagar	No Mineral concession
8	Sahari khad	From origin to confluence with Govindsagar	No Mineral concession
9	Pansa khad	From origin to confluence with Govindsagar	No Mineral concession
10	Kharota khad	From origin to confluence with Govindsagar	No Mineral concession
11	Daret khad	From origin to confluence with Govindsagar	No Mineral concession
12	Kodra khad	From origin to confluence with Govindsagar	No Mineral concession
Right Bank			
13	Chaprot khad	From origin to confluence with Govindsagar	No Mineral concession
14	Dhuk khad	From origin to confluence with Govindsagar	No Mineral concession
15	Kolka khad	From origin to confluence with Govindsagar	No Mineral concession
16	Raipur khad	From origin to confluence with Govindsagar	No Mineral concession
17	Dober khad	From origin to confluence with Govindsagar	No Mineral concession
18	Chaukat khad	From origin to confluence with Govindsagar	No Mineral concession

13.5 Streams Flowing into Satluj Between Bhakra Dam and Nangal

Table No. -36 Showing recommendations for streams flowing into Satluj between Bhakra dam and Nangal

Sr No,	Name of tributary	From-To	**Recommendations**
1	Fatehal khad	From origin to 500 m upstream of Fatehal village From 500m upstream of Fatehal village to Punjab border	No mineral concession Recommended for mineral concession
2	Behre do cho khad	From origin to Punjab Border	No mineral concession
3	Bangarh khad	From origin to Punjab Border	No mineral concession
4	Jakhera khad	From origin to Punjab Border	No mineral concession
5	Thapal khad &other	From origin to Punjab Border	No mineral concession

	tributries		

13.6 Panjoinwala Khad

Table No. -37 Showing recommendations for Panjoiwala khad

Sr No,	Name of tributary	From-To	Recommendations
1	Panjaonwali & other streams	From origin to Kuthar village From Kuthar village to Punjab border	No mineral concession Recommended for mineral concession

14.0 General Recommendations

The part of river/stream beds recommended for grant of mineral concessions in this report are based on reconnaissaince survey conducted for whole of District Una , however before grant of any mineral concession in a particular river/stream bed, the guidelines contained in River/Stream bed mining policy are to be followed in addition to site specific conditions as specified bv the Joint Inspection Committee and recommendation thereof. In the ibid Policy Guidelines, following general conditions are mentioned

1 No River/Stream bed mining shall be allowed without the recommendations of the Sub-Divisional Level Committee.

2 No River/Stream bed mining shall be allowed without getting clearance under Forest Conservation Act, 1980 if the area attracts the provisions of FCA. 1980.

3 No River/Stream bed mining shall be allowed within 75 meters from the periphery of soil conservation works, nursery plantation, check dams or within the distance as recommended by the Sub-Divisional Committee, which ever is more.

4 No River/Stream bed mining shall be allowed within 1/5th of its span or 5 meters from the bank or as specified by the Sub-Divisional Committee which ever is more.

5 No River/Stream bed mining shall be allowed within 200 meters U/S and D/S of Water Supply Scheme or the distance as specified by the Sub- Divisional Committee which ever is more.

6 No River/Stream bed mining shall be allowed within 200 meters U/S and 200 to 500 mts D/S of bridges depending upon the site-specific conditions.

7 No approach road from PWD road shall be allowed to River/Stream beds mining, unless lessee/contractor obtains written permission from XEN PWD for making road leading to all intake places from the PWD Roads.

8 No mechanical mining through mechanical excavator including any other earth moving machines like JCB, Bouldozer,Pocklain,Loders etc shall be carried out in

river or stream Bed by the lease holder or permit holder or contractor as the case may be.

9 No boulder/cobbles/hand broken road ballast shall be allowed to be transported outside the State from River/Stream beds, so as to reduce pressure on the River/Stream beds.

10 No digging of more than 3 feet shall be allowed in River/Stream beds.

11 Every leaseholder shall supply in advance, the Registration Nos of vehicle engaged in transportation of mineral from mining area to his industrial unit. This would ensure checking of illegal vehicles carrying minerals.

12 Every lessee/contractor shall ensure that his labour does not involve in fish poaching.

13. No blasting shall be allowed in river/stream beds.

15.0 General Conditions

1. Some of the rivers/streams or portion of rivers/streams have been prohibitited for grant of mineral concession. In such portions if any person applies for open sale of mineral the mining lease for open sale may be granted in private lands to meet out the local demands or any exigency subject to the approval from the joint Inspection Committee.

2. In certain stretches of river/streams, islands are developed which are undesirable and cause cutting of banks. In such places i.e. central islands etc. can be done more than one meter in rare and exceptional circumstances after a detailed study.

3. The possibility for conducting the auction of river/stream bed as one unit where the same are forming inter District boundary should be explored for the rivers flowing through the boundary of two districts.

4. The auction shall be done as per the recommendation /approval of the Sub-Divisional Level Committee

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Shivalik Solid Waste Management Limited

Registered Office: Vill. Majra, P.O Dabhota, Tehsil Nalagarh, Dist. Solan (Himachal Pradesh) 174 101,
Corporate Office: SCO 20-21, Ist floor, Near Hotel Dolphin, Baltana, Zirakpur (Punjab) 140 604.

*The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –*

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including opencast/ underground mining	1	1 (a) (i)	A
2	River Valley Projects	3	1 (c)	A
3	Thermal power plants	4	1 (d)	B
4	Metallurgical industries (ferrous & nonferrous)- both primary & secondary	8	3 (a)	B
5	Pesticides industry and pesticide specific intermediates(excluding formulations)	17	5 (b)	A
6	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	32	7 (d)	A
7	Bio-medical waste treatment facilities	32A	7 (d a)	B
8	Common Effluent Treatment Plants (CETPs)	36	7 (h)	B
9	Common Municipal Solid Waste Management Facility (CMSWMF)	37	7 (i)	B
10	Building and construction projects	38	8 (a)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in SAAC minutes dated June 10, 2022 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/22/2447 dated July 28, 2022. The accreditation needs to be renewed before the expiry date by Shivalik Solid Waste Management Limited, Zirakpur following due process of assessment.

Sr. Director, NABET
Dated: July 28, 2022

Certificate No.
NABET/EIA/2023/SA 0169

Valid up to
Aug. 16, 2023

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EXECUTIVE SUMMARY

1.1INTRODUCTION

The project has been proposed by Sh. Lakhwinder Singh S/o Sh. Jagmail Singh for the Mining of Sand Stone and Bajri from Mauza/Mohal Kuthar beet Tehsil Haroli, District Una H.P. The letter of intent for mining lease has been issued vide letter no. Udyog-Bhu(Khani-4) Laghu- 855/2020-4198 Dated 27-08-2021.

The proposed project is having area of 07-21-35 Ha. (Pvt. Land, Hill slope) and falls under Category- "B1" as per EIA Notification 2006 of the Ministry of Environment and Forests, New Delhi and amended thereof.

1.2 DETAILS OF MINING PROCESS & LOCATION

Project name	Mining of Sand Stone and Bajri from Mauza/Mohal Kuthar beet Tehsil Haroli, District Una H.P. by Sh. Lakhwinder Singh S/o Sh. Jagmail Singh.
Mining lease area	07-21-35 Ha.
Location of mine	Khasra No. 1165, 1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227 Mauza/Mohal Mohakampur Kuthar beet Tehsil Haroli, District Una H.P.
Latitude	31° 23' 53.47" N to 31° 23' 29.23" N
Longitude	76° 10' 22.51" E to 76° 10' 32.01"E
Toposheet number	53A3, 53A7
River/Nallah/Tanks/Lakes et.	Soan River
Minerals of Mine	Sand ,Stone, & Bajri
Proposed production of mine	3,54,258 MTPA
Method of mining	Semi-Mechanized
No of working days	270 days
Cost of the Project	20 Lakhs
Water demand	1.35 (Domestic) +6.0 (Dust Suppression) =7.35 KLD
Sources of water	Water will be supplied from Bore well for drinking purpose & dust suppression which is located khatta No.162min khatuni no. 253min Khasra No. 2180 in mohalla VPO Kungrat Tehsil Haroli District Una H.P.
Man power	30 workers

Waste Generation	39,362 TPA mine waste generated during mining activities.
Nearest railway station	Jaijon Doaba Railway Station: about. 6.3 km in the SW direction (Aerial Distance).
Nearest state highway/national highway	National Highway: - NH 503A (Hoshiyarpur-Una Road) About 9.8 km in NNE direction.
Nearest airport	Ludhiana Airport: approx. 63.5 km in SSW Direction (Aerial Distance).
Seismic zone	Seismic zone IV

1.3 STATUS OF ENVIRNMENT

The baseline environment quality represents the background environmental scenario of various environmental components such as Land, Water, Air, Noise, Biological and Socioeconomic status of the study area. 3 months (Oct. to Dec. 2022) baseline study for the proposed project.

Ambient Air quality was monitored at 8 locations. The value of all parameters i.e PM_{10}, $PM_{2.5}$, SO_2, NOx, Co, NH_3 and O_3 was found within permissible limits. Surface & ground water were monitored at 6 and 6 locations respectively. The water was found fit for consumption for various uses. The soil samples were collected at 6 location soil is alkaline pH ranges from 7.12 to 7.89 and texture is Sandy Loam.

1.4 ENVIRONMENT MANAGEMENT PLAN

1.4.1 LAND

There is no significant degradation of land due to creation of access roads, mining operations, and transportation of mined material. In order to prevent the environmental degradation of leased mine area and its surroundings, the following measures shall be taken.

- Mineral will be mined out after leaving 5-meter safety zone .
- In this activity, the work is proposed to be done manually as well as semi mechanically which will avoid adverse effects associated with heavy machinery and their functioning.
- The mining will be done in non-monsoon seasons only.
- Operations during daylight only.

Movement of the vehicles on the road will be increased; however, non-metalled road leading to sand and stone mining area will be sprinkled with water at regular intervals. In addition to prevent spillage by trucks/tractor trolley, overloading should be controlled along with speed limit.

There is no soil over mineralized area. Soil Quality will be monitored on yearly basis in the area surrounding the core zone used for agricultural activity to check for any negative impacts on the soil quality.

Since mining lease area is a restored after mining so plantation will be done in the lease area however, plantation of suitable species like Kachnar, Neem, Amaltas, Toon, Bihul, Khirk, Seris, Shisham, Khair, Paja, Robinia, Ban, Bauhinia vahlii species etc. will be planted.

It is suggested to carry out plantation for five years with suitable species from the date of operation.

1.4.2 WATER POLLUTION CONTROL MEASURES

I Surface water

There will be no surface water pollution due to sand mining. However, the following measures shall be undertaken to prevent water pollution.

- Utmost care will be taken to minimize spillage of stone and sand.
- Drains and their Catchments will be constructed just beside the access roads so that the storm water gets settled before flowing to the river/Nallah.
- The washing of trucks and tractor trolleys in the mining lease will be avoided.
- Plantation will be done to restore the affected mining lease area.

II Ground water

There would not be any adverse effect on the ground water quality. The process of sand, stone and *Bajri* mining activity does not contain any harmful element, which could percolate into the ground and pollute the ground water. Hence, no control measures are required.

- However, regular monitoring of water quality in the existing hand pumps/tube wells in the vicinity will be carried out.

1.4.3 AIR POLLUTION CONTROL MEASURES

The proposed mining operations are not anticipated to raise the concentration of the pollutants beyond prescribed limits. However, the following measures would be adopted to mitigate the PM_{10} level in the ambient air. Dust particles generated during various

mining activities when become airborne lead to increase in PM_{10} level in the ambient air. The major source of dust generation is the transport of material by trucks and tractor trolleys. Adequate control measures shall be taken during mining operations as well as transportation of minerals.

The following steps shall be adopted to prevent air pollution due to airborne dust.

- Plantation will be done along the roadsides and also at the crusher site after consultation with local villagers/authority.
- Dust mask provided to the workers engaged at dust generation points like excavations, loading and unloading points.
- The only air pollution sources are the road transport network of the trucks. The dust suppression measures like water sprinkling will be done on the roads.
- Utmost care will be taken to prevent spillage of sand and stone from the trucks.
- Overloading will be prevented. The trucks/ tractor trolley will be covered by tarpaulin covers.

1.4.4 NOISE POLLUTION CONTROL MEASURES

As there is no heavy earth moving machinery therefore, no major impact on noise level due to the proposed mining and other association activities, a detailed noise survey has been carried out and results were cross referenced with standards and were found to be well within limits.

Blasting is not used for this sand and stone mining, hence, no possibility of land vibration. It was found that the proposed mining activity will not have any significant impact on the noise environment of the region. The only impact will be due to transportation of sand and stone by trucks and tractor trolleys.

As the only impact is due to transportation of stone to the stone crushing unit and sand to the market though village roads, the following control measures shall be taken to keep the ambient noise levels well within limits:

- Minimum use of horns and speed limit of 10 kms per hour in the village area.
- Timely maintenance of vehicles and their silencers to minimize vibration and sound.
- Phasing out of old and worn-out trucks.
- Provision of green belts in consultation with village panchayat along the road networks.

- Care will be taken to produce minimum sound during sand and stone loading.

1.4.5 BIOLOGICAL ENVIRONMENT

The mining activity will have insignificant effect on the existing flora and fauna. Data have been collected from various Government Departments such as forests, agriculture, fisheries, animal husbandry and various offices to establish the pre project biological environmental conditions. It was found that the sand and stone mining activity will not have any significant impact on the biological environment of the region.

Mitigation measures of impacts on biological environment

1. It will be ensured that no mining activity will be carried out during the monsoon season.
2. As the mining site has no vegetation, no clearance of vegetation will be done.
3. Sprinkling will be done on the haul roads with water to avoid the dust emission, thus avoiding damage to the crops.
4. Mining will be carried out day time only.
5. No discard of food, polythene waste etc. will be allowed in the lease area which would distract/attract the wildlife.
6. No nighttime mining will be allowed which may catch the attention of wild.
7. Workers will be made aware of the importance of the wildlife and signage will be displayed at the sensitive area to caution worker and other passerby.

1.4.6 SOCIO-ECONOMIC ENVIRONMENT

This project operation will provide livelihood to the poorest section of the society. The overall impact of mining of stone, boulders, bajri & sand on the social economics of the area shall be a very positive one, as not only it will generate employment opportunities for local population at mine site but also in associated activity i.e at stone crushing plant, for transportation of mined material, *etc.* It will also give a good boost to the general economy of the area. About 30 persons shall be employed at mine site and approximately 25-30 total people are to be benefited directly or indirectly by the project

Anticipated impacts and evaluation

The results of the field survey conducted based on a questionnaire prepared to understand the knowledge and perception of the people living around the project area, gives a clear idea about the need for the project. A major portion of the houses in the study area are pucca type structures. The solid waste generated in the area is dumped into open land since there are no collecting agencies in the area. The awareness level regarding the proposed mining activity is very high.

The proposed mining activity is expected to provide stimulus to socio-economic activities in the region and thereby accelerate further development processes. However, there is an apprehension that local people may get engaged in illegal activities if the proposed mining operation or the project is shelved or there is inordinate delay in its execution.

BUDGET ALLOCATION FOR ENVIRONMENT MANAGEMENT PLAN FOR FIVE YEARS

(RS IN LAKHS)

S.NO	PARTICULARS	CAPITAL COST	RECURRING COST/YR	RECURRING COST RS	TIMELINE
1.	Monitoring of Air, Water, Soil, etc. twice a year.	--	1.0	5.0	Once in a six month (As per CPCB guideline)
2.	Air Pollution Control- Management of Haulage Roads & mine road of 1000 meters including Sprinkling. Tractor trolley with sprinkler	--	1.40	7.00	Twice a day & as per requirement
3.	Green Belt Development Area for Plantation= 7.2135 Ha. **No. of plants = 8656 Plants** Plantation is proposed @* 1200 plants per Hect. *Cost and No. of plants are as per the ***No.Ft.1790-/71(D)2011-12/Vol-VIII(Norms), Himachal Pradesh Forest Department, Shimla Dated 07 June 2019**	11.17	5.24	26.20	After formation of each Benches
4	Protection wall for waste dump Dimension* R1* (L -80 m X W- 1 m X H- 3m) *4 =960 Cu.m ***@1469.25/cu.m*(@Rs.979.50/cu.m And 50% escalation cost. Dry rubble masonry in breast wall and retaining walls revetment walls and parapets etc. as per Standard Schedule of Rate 2009 H.P.)***	14.1	1.41	7.05	Protection wall constructed around the waste dump at the 1st year of mining

5	Septic tank	0.20	0.06	0.30	Constructed before the mining operation started
6	Check Dam/Retaining wall structure Check Dam 1 ,2,3,4,5 *(L -40m W- 1.0m X H- 2.0m) Each 80 Cu.m X 5 =400 Cu.m. ***@3004.05/cu.m. Dry rubble masonry in breast wall and retaining walls revetment walls and parapets etc. as per Standard Schedule of Rate 2009 H.P.)***	12.0	1.2	6.0	As per mining plan, five numbers of Check dams /Retaining Wall of (40 meters' length 1 meters' Width and 2.0 meter's height) has been proposed for protect the debris to move downwards.
7	RWH pit Chamber *(L -18 m X W- 6 m X H- 2m) *Cost as per market rate	0.20	0.01	0.05	Constructed at the 1st Year of mining
8	Occupational Health Measures Provision of PPE, First Aid and other miscellaneous expenditure.	0.30	0.03	0.15	As per requirement
Total		37.97	10.35	51.75	---------

कार्यकारी सारांश

1. भूमिका

श्री लखविंदर सिंह पुत्र श्री जगमेल सिंह, हिमाचल प्रदेश के ऊना जिले के हरोली में मौजा/मोहल कुठार बिट के पास स्थित खसरा नंबर 1165, 1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227 से रेत ,पत्थर और बजरी के खनन हेतु प्रस्तावित जारी किया गया है। जिसके खसरे नंबर का खनन क्षेत्र लगभग 07-21-35 हैक्टेयर है। श्री लखविंदर सिंह पुत्र श्री जगमेल सिंह को रेत, पत्थर और बज़री खनन हेतु “माइनर मिनरल कॉनसेशन रूल के संशोधित नियम 1971”, के तहत पत्र सं उद्योग-भू (खानी-4) लगु-855/2020-4198 दिनांक 27-08-2021. अनुमोदन तिथि के अनुसार स्वीकृति प्रदान की गयी है।

प्रस्तावित परियोजना का पट्टा क्षेत्र 7.2135 हेक्टेयर है, जो पर्यावरण और वन मंत्रालय, नई दिल्ली द्वारा जारी कार्यालय ज्ञापन के संशोधित ईआईए अधिसूचना 2006 के अनुसार श्रेणी- "बी 1" के अंतर्गत आता है। क्योंकि परियोजना खदान पट्टा क्षेत्र 5 हेक्टेयर से अधिक है।

2. परियोजना के प्रकार

पर्यावरण एवं बन मंत्रालय के अनुसार नई दिल्ली गज़ेट नोटिफिकेशन (राज-पत्र अधिसूचना) दिनांक 14 सितंबर 2006 और उसके संशोधन के अनुसार, प्रस्तावित खनन परियोजना को श्रेणी 'बी1 परियोजना’ के रूप में वर्गीकृत किया गया है।

2.1 खनन प्रक्रिया और स्थान का विवरण

परियोजना का नाम	श्री लखविंदर सिंह पुत्र श्री जगमेल सिंह, द्वारा प्रस्तावित रेत, पत्थर और बज़री का खनन।
खनन पट्टा क्षेत्र	7.2135 हैक्टेयर
खनन पटटे का स्थान	खसरा क्र: 1165, 1166, 1169, 1173, 1174, 1196, 1197, 1198, 1200, 1206, 1206/1, 1226 & 1227 मौजा/मोहाल- मोहकमपुर कुठार बिट , तहसील हरोली, जिला ऊना, हिमाचल प्रदेश।
अक्षांश	31° 23' 53.47" N to 31° 23' 29.23" N
देशान्तर	76° 10' 22.51" E to 76° 10' 32.01"E
टोपोशीट नंबर	53A3, 53A7

नदी / नाला / टैंक / झीलों आदि	सोन नदी
खनन खनिज	रेत, पत्थर और बज़री
खनन का प्रस्तावित उत्पादन	3,54,258 MTPA
खनन की विधि	अर्ध यंत्रीकृत खनन
कार्य करने के दिन	270 दिन
परियोजना की लागत	20 लाख
पानी की मांग	1.35 KLD (पीने/घरेलू उपयोग हेतु)) + 6.0 KLD (धूल नियत्रंण हेतु) = 7.35 KLD
पानी के स्त्रोत	पीने के उद्देश्य और धूल दमन के लिए बोर वेल से पानी की आपूर्ति की जाएगी जो कि खट्टा नं. 162 मिनट खतौनी नं. 253 मिनट खसरा नंबर 2180 मोहल्ला वीपीओ कुंगराट तहसील हरोली जिला ऊना में है।
श्रमिक	30 श्रमिक
अपशिष्ट उत्पादन	39,362 tons मिश्रित गाद और मिट्टी के साथ रेत उत्पन्न होगी ।
निकटतम रेलवे स्टेशन	**जैजों दोआबा रेलवे स्टेशन:-** दक्षिण पूर्वदिशा में लग-भग 6.3 किलोमीटर (एरियल डिस्टेंस).
निकटतम राज्य राजमार्ग / राष्ट्रीय राजमार्ग	**राष्ट्रीय राजमार्ग सड़क (NH 503A) :-** उत्तर उत्तर पूर्व दिशा में लग-भग 9.8 किलोमीटर (एरियल डिस्टेंस).
निकटतम हवाई अड्डा	**लुधियाना हवाई अड्डा -** दक्षिण दक्षिण पश्चिम दिशा में लग-भग 63.5 किलोमीटर (एरियल डिस्टेंस).
भूकंपीय क्षेत्र	सिस्मिक ज़ोन - चार

2. खनन की विधि

यह एक खुली खदान खनन परियोजना है। खनन पट्टा क्षेत्र से रेत, पत्थर और बज़री का खनन किया जाएगा। कार्य अर्ध यंत्रीकृत होगा जिसमे फावड़ों, छलनियो, गेंतियो, मशीन आदि जैसे उपकरणों का उपयोग किया जायेगा। यह खनन खनिजों (रेत, पत्थर और बज़री) के मौजूदा रूप में किया जाएगा। रेत, पत्थर और बज़री का खनन जमींन से 1 मीटर तक की गहराई में ही किया जायेगा।

3. पर्यावरण प्रभाव आकलन

आधारभूत पर्यावरण गुणवत्ता अध्ययन क्षेत्र की भूमि, जल, वायु, शोर, जैविक और सामाजिक-आर्थिक स्थिति जैसे विभिन्न पर्यावरणीय घटकों की पृष्ठभूमि पर्यावरणीय परिदृश्य का प्रतिनिधित्व करती है। प्रस्तावित परियोजना के लिए 3 महीने (अक्टूबर से दिसंबर 2022) आधारभूत अध्ययन(Baseline Monitoring) किया गया है।।

8 स्थानों पर एंबियंट एयर क्वालिटी की निगरानी की गई। सभी मापदंडों अर्थात PM10, PM2.5, SO2, NOx, Co, NH3 और O3 का मान स्वीकार्य सीमा के भीतर पाया गया। सतही और भूजल की निगरानी क्रमश: 6 और 6 स्थानों पर की गई। पानी विभिन्न उपयोगों के लिए खपत के लिए उपयुक्त पाया गया। मिट्टी के नमूने 6 स्थानों पर एकत्र किए गए मिट्टी का पीएच 7.12 से 7.89 तक है और मिट्टी sandy to sandy loam है।

3.1 भूमि

खनन कार्य, ऐप्रोच रोड के निर्माण, खनन संचालन और खनन सामग्री के परिवहन के कारण भूमि का क्षरण खनन का बहुत महत्वपूर्ण प्रतिकूल प्रभाव नहीं है। पट्टे पर दिए गए खान क्षेत्र और उसके आसपास के पर्यावरणीय क्षरण को रोकने के लिए निम्नलिखित उपाय किए जाएंगे:

- खनिज का खनन 5 मीटर के सुरक्षा क्षेत्र को छोड़ने के बाद किया जाएगा।
- इस गतिविधि में, काम को मैन्युअल रूप से और साथ ही अर्ध यांत्रिक रूप से करने का प्रस्ताव है जो भारी मशीनरी और उनके कामकाज से जुड़े प्रतिकूल प्रभावों से बचेंगे। खनन केवल गैर-मानसून मौसम में की जाएगी ।
- खनन केवल दिन के दौरान किया जाएगा ।

सड़कों पर वाहनों की आवाजाही बढ़ाई जाएगी; हालांकि, रेत और पत्थर खनन क्षेत्र की ओर जाने वाली कच्ची सड़क पर नियमित अंतराल पर पानी का छिड़काव किया जाएगा। ट्रकों/ट्रैक्टर ट्रॉली द्वारा छलकाव को रोकने के अलावा, गति सीमा के साथ-साथ ओवर लोडिंग को नियंत्रित किया जाना चाहिए। खनिजयुक्त क्षेत्र में कोई मिट्टी नहीं है। मिट्टी की गुणवत्ता पर किसी भी नकारात्मक प्रभाव की जाँच के लिए कृषि गतिविधि के लिए उपयोग किए जाने वाले कोर ज़ोन के आसपास के क्षेत्र में मिट्टी की गुणवत्ता की वार्षिक आधार पर निगरानी की जाएगी। चूंकि खनन के बाद खनन पट्टा क्षेत्र को बहाल किया जाता है, इसलिए पट्टा क्षेत्र में वृक्षारोपण किया जाएगा। कचनार, नीम, अमलतास, तून, बिहुल, खिरक, सेरीस, शीशम, खैर, पाजा, रोबिनिया, बान, बाउहिनिया वाहली आदि उपयुक्त

प्रजातियों का रोपण किया जायेगा। संचालन की तिथि से उपयुक्त प्रजातियों के साथ पांच वर्षों तक वृक्षारोपण करने का सुझाव दिया गया है

3.2 जल प्रदूषण नियंत्रण उपाय

(A) धरातल-जल

रेत खनन के कारण सतही जल प्रदूषण का प्रमुख स्रोत नगण्य है, हालांकि जल प्रदूषण को रोकने के लिए निम्नलिखित उपाय किए जाएंगे।

- पत्थर और रेत के छलकाव को कम करने के लिए अत्यंत सावधानी बरती जाएगी।
- नालियों और उनके जलग्रहण क्षेत्रों का निर्माण पहुंच मार्गों के ठीक बगल में किया जाएगा ताकि तूफान का पानी नदी/नाले में बहने से पहले स्थिर हो जाए।
- खनन पट्टे में ट्रकों और ट्रैक्टर ट्रालियों की धुलाई से बचा जा सकेगा।
- प्रभावित खनन पट्टा क्षेत्र को बहाल करने के लिए पौधारोपण किया जायेगा.

भू-जल

भूजल की गुणवत्ता पर कोई प्रतिकूल प्रभाव नहीं पड़ेगा। खनिज उत्पादन में कोई हानिकारक तत्व नहीं होता है, जो जमीन में फैल सके और भूजल को प्रदूषित कर सके। इसलिए, किसी प्रकार के नियंत्रण उपायों की आवश्यकता नहीं है।

फिर भी आसपास के मौजूदा हैंड पंपों/नलकूपों में जल गुणवत्ता की नियमित निगरानी, क्षेत्र और समय अंतराल के संदर्भ में की जाएगी।

3.3 वायु प्रदूषण नियंत्रण उपाय

प्रस्तावित खनन कार्यों के लिए प्रदूषकों का स्तर निर्धारित सीमा के भीतर है। फिर भी, परिवेशी वायु में PM_{10} के स्तर को कम करने के लिए निम्नलिखित उपायों को अपनाया जाएगा:-

विभिन्न खनन गतिविधियों के दौरान उत्पन्न धूल कण परिवेशी वायु में PM_{10} के स्तर में वृद्धि करते हैं। धूल उत्पादन का प्रमुख स्रोत टिपर ट्रक और ट्रैक्टर/ट्रॉलियों द्वारा खनिजों का परिवहन है। खनिजों के परिवहन के साथ-साथ खनन कार्यों के दौरान पर्याप्त नियंत्रण के उपाय किए जाएंगे। वायु प्रवाह से पैदा होने वाली धूल के कारण वायु प्रदूषण को रोकने के लिए निम्नलिखित कदम उठाए जाएंगे:-

- ग्रीन बेल्ट को रोड साइड पर किया जाएगा।
- धूल उत्पन्न करने वाले कार्य जैसे खुदाई, लोडिंग और अनलोडिंग पॉइंट पर काम करने वाले श्रमिकों को धूल अवरोधी मास्क दिए जायेंगे।
- वायु प्रदूषण का मुख्य स्रोत टिपर ट्रक, ट्रैक्टर/ट्रॉलियों का सड़क परिवहन नेटवर्क हैं।

- सड़कों पर पानी के छिड़काव से धूल दमन किया जाएगा।
- टिपर ट्रक ट्रैक्टर/ट्रॉलियों से रेत और पत्थर को बाहर गिरने से रोकने के लिए अत्यंत सावधानी बरती जाएगी।
- खनिज के परिवहन के कारण धूल के उत्सर्जन को कम करने के लिए पानी का छिड़काव किया जाएगा।
- टिपर ट्रैक्टर/ट्रॉलियों की ओवरलोडिंग को रोका जाएगा एवम इसे तिरपाल से कवर किया जाएगा।

3.4 ध्वनि प्रदूषण नियंत्रण उपाय

किसी भी भारी मशीनरी का उपयोग नहीं होगा इसलिए रेत खनन और अन्य खनन गतिविधियों के कारण शोर के स्तर पर कोई बड़ा प्रभाव नहीं पड़ेगा, एक विस्तृत शोर सर्वेक्षण किया गया है जिसमे परिणाम मानकों के साथ, संदर्भित और निर्धारित सीमा के भीतर परिणाम पाए गए है।

खनिजों के खनन में रेत और पत्थर उठाने के लिए ब्लास्टिंग तकनीक का उपयोग नहीं किया जायेगा, इसलिए भूमि कंपन की कोई संभावना नहीं है। यह पाया गया कि प्रस्तावित खनन गतिविधि के क्षेत्र का शोर वातावरण पर कोई महत्वपूर्ण प्रभाव नहीं पड़ेगा। टिपर ट्रक और ट्रैक्टर ट्रॉलियों द्वारा रेत, पत्थर और बजरी के परिवहन के कारण शोर उत्पन्न होगा। खनिजों के परिवहन एवं पत्थर को स्टोन क्रेशर इकाई तक कच्ची सड़कों द्वारा ले जाने के एकमात्र कारण से शोर उत्पन्न होगा। शोर के प्रभाव को निमन लिखित गतिविधियों द्वारा कम किया जायेगा।

- ग्रामीण क्षेत्र में हॉर्न का न्यूनतम उपयोग 10 किलोमीटर की निर्धारित गति सीमा के अनुसार किया जायेगा।
- कंपन और ध्वनि को कम करने के लिए वाहनों और उनके साइलेंसरो का एक समय अंतराल पर रखरखाव किया जायेगा।
- पुराने और खराब ट्रकों को बाहर निकाला जायेगा।
- रेत और पत्थर लोडिंग के दौरान ध्वनि स्तर को कम करने के लिए हर सम्भव कोशिश की जाएगी।

3.5 जैविक पर्यावरण

खनन गतिविधि का मौजूदा वनस्पतियों और जीवों पर नगण्य प्रभाव पड़ेगा। पूर्व परियोजना जैविक पर्यावरण स्थितियों को स्थापित करने के लिए वन, कृषि, मत्स्य पालन, पशुपालन और विभिन्न कार्यालयों जैसे विभिन्न सरकारी विभागों से डेटा एकत्र किया गया है। यह पाया

गया कि रेत और पत्थर खनन गतिविधि का क्षेत्र के जैविक पर्यावरण पर कोई महत्वपूर्ण प्रभाव नहीं पड़ेगा।

शमन उपाय

- यह सुनिश्चित किया जाएगा कि जलीय जीवन पर प्रभाव को कम करने के लिए मानसून के मौसम के दौरान कोई खनन गतिविधि नहीं की जाएगी जो मुख्य रूप से कई प्रजातियों के लिए प्रजनन का मौसम है।
- धूल उत्सर्जन से बचने के लिए पानी का सड़कों पर छिड़काव किया जाएगा, जिससे फसलों को नुकसान से बचाया जा सकेगा।
- वन्यजीवों को विचलित एवम आकर्षित करने वाले पदार्थ जैसे भोजन, पॉलिथीन कचरे आदि को खनन पट्टे के क्षेत्र में रखने की अनुमति नहीं दी जाएगी।
- रात के समय खनन की अनुमति नहीं दी जाएगी क्योंकि यह जंगली जीवन का ध्यान आकर्षित कर सकती है।

3.6 सामाजिक-आर्थिक वातावरण

यह परियोजना स्थानीय लोगो को आजीविका प्रदान करेगा। इस परियोजना (रेत, पत्थर एवं बजरी का खनन) के संचालन से स्थानीय क्षेत्र की सामाजिक अर्थ व्यवस्था पर बहुत ही सकारात्मक प्रभाव होगा, क्योंकि यह न केवल खदान स्थल पर बल्कि इससे जुड़े स्टोन क्रेशर पर खनन सामग्री के परिवहन कारयो आदि में भी स्थानीय लोगो के लिए रोजगार के अवसर पैदा करेगा। यह स्थानीय क्षेत्र की सामान्य अर्थव्यवस्था को भी अच्छा बढ़ावा देगा।

5.0 पर्यावरण प्रबंधन योजना के लिए बजट आवंटन

संख्या	विवरण	पूंजीगत लागत (लाख रुपयों में)	वार्षिक आवर्ती लागत (लाख रुपयों में)	5 साल के लिए आवर्ती लागत (लाख रुपयों में	समय सीमा
1	हवा, पानी, मिट्टी आदि का अधययन वर्ष में दो बार	--	1.0	5.0	छह महीने में एक बार (CPCB दिशानिर्देश के अनुसार)

2	वायु प्रदूषण नियंत्रण- खनिज ढुलाई वाली सड़क पर धूल को नियंत्रित करने के लिए वाटर स्प्रिंकलर द्वारा छिड़काव किया जायेगा	--	1.40	7.00	दिन में दो बार और आवश्यकता के अनुसार
3	हरित पट्टी विकास वृक्षारोपण के लिए भूमि क्षेत्र = 7.2135 हेक्टेयर पौधों की संख्या=8656 पौधे वृक्षारोपण प्रस्तावित है @ *प्रति हेक्टेयर 1200 पौधे। *लागत *No.Ft.1790-/ 71 (D) 2011-12/Vol-VIII (मानदंड), हिमाचल प्रदेश वन विभाग, शिमला दिनांक 07 जून 2019 के अनुसार है।	11.17	5.24	26.20	पर्यावरण मंजूरी मिलने के बाद
4	चेक डैम/रिटेनिंग वॉल स्ट्रक्चर चेक डैम 1,2,3,4,5 *(लम्बाई-40 मीटर X चौडाई-1.0 मीटर X ऊंचाई-2.0 मीटर)=80 Cu.m. x 5 = 400 Cu.m ***@3004.05/cu.m. Dry rubble masonry in breast wall and retaining walls revetment walls and parapets etc. as per Standard Schedule of Rate 2009 H.P.)***	12.0	1.2	6.0	खनन योजना के अनुसार पांच मलबे नीचे की ओर जाने से बचाने के लिए चेक डैम की संख्या / रिटेनिंग वॉल (40 मीटर की लंबाई 1 मीटर की चौड़ाई और 2.0 मीटर की ऊंचाई) का प्रस्ताव किया गया है।
5	सेप्टिक टैंक	0.20	0.06	0.30	खनन कार्य शुरू होने से पहले आवश्यकता के अनुसार निर्माण किया जाएगा

6	व्यावसायिक स्वास्थ्य सुरक्षा उपाय, व्यक्तिगत सुरक्षा उपकरण (पीपीई), प्राथमिक चिकित्सा एवम अन्य विविध व्यय प्रावधानों के उपाय	0.30	0.03	0.15	---------
7	वर्षा जल संचयन गड्ढा *(L -18 m X W- 6 m X H- 2m) *लागत बाजार दर के अनुसार	0.30	0.03	0.15	आवश्यकता के अनुसार
8	कूड़ा डंप के लिए सुरक्षा दीवार Dimension* R1* (L -80 m X W- 1 m X H- 3m)*4 =960 Cu.m ***@1469.25/cu.m*(@Rs.979.50/cu.m And 50% escalation cost. Dry rubble masonry in breast wall and retaining walls revetment walls and parapets etc. as per Standard Schedule of Rate 2009 H.P.)***	14.1	1.41	7.05	सुरक्षा दीवार का निर्माण किया खनन के पहले वर्ष में कचरे के ढेर के आसपास
कुल लागत		**37.97**	**10.35**	**51.75**	**------**