

DRAFT EIA REPORT
FOR
SAND MINING PROJECT

AT

Block-37 (Gaya Morhar-24) Sand Ghat on River Morhar

**Mauza- Babandih, Padaria, Pakri Guriya & Chuawar, Anchal-
Imamganj, District- Gaya, State- Bihar**

AREA: 29.0 Hectare or 71.63 Acre,

CAPACITY: 522000 cum per annum or 939600 TPA.

APPLICANT
Dinanath Singh
Add- Lasarhi, P.O- Agiaon, P.S.- Garhani,
District- Bhojpur, State- Bihar.

PREPARED BY

ENVIRONMENT CONSULTANT

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Draft EIA Report for Proposed Sand Mining Project at Block-37 (Gaya Morhar-24) Sand Ghat on Morhar River, Area: 29.0 Hectares, Mauza- Babandih, Padaria, Pakri Guriya & Chuawar, Anchal- Imamganj, District- Gaya, State- Bihar.

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List of Annexure

Annexure	Title
Annexure -I	Letter of Intent (LOI)
Annexure -II	Mine Plan Approval Letter
Annexure -III	Terms of Reference(ToR)
Annexure -IV	Satellite Imaginary Last 3 Years
Annexure -V	2.5 Km Utility Map
Annexure -VI	English Executive Summary
Annexure -VII	Hindi Executive Summary

1 INTRODUCTION

1.1 Preamble

The term Environment Impact Assessment (EIA) refers to the anticipation of various impacts a project will have on the environment and the local community. It is a decision-making tool, which guides decision makers in taking appropriate decisions prior to sanctioning clearance. Environmental Impact Assessment (EIA) is a tool used to identify the environmental, social and economic impacts of a project prior to decision-making. It aims to predict environmental impacts at an early stage in project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment and present the predictions and options to decision-makers. By using EIA both environmental and economic benefits can be achieved, such as reduced cost and time of project implementation and design, avoided treatment/clean-up costs and impacts of laws and regulations.

1.2 General Information

The proposed sand mining project at **Block -37 (Gaya Morhar -24)** Sand Ghat on Morhar River, Area: **29.0** Hectares, Mauza- Babandih, Padaria, Pakri Guriya & Chuawar, Anchal- Imamganj, District- Gaya, State- Bihar. The state government has issued the LOI for a period of five years vide letter no- **5511/Khanan**, Gaya, dated **29-11-2022** in favor of **Dinanath Singh**. A copy of LOI is attached as **Annexure-I**.

Mine plan and Progressive Mine Closure Plan: Mining Plan and Progressive Mine Closure Plan of the proposed mine lease area is prepared by Er. Pravin Kr Sinha. Having Regd. No. RQP/BIH/SR.NO.20, Letter No. 3825, dated 07/11/2019.

The mining plan for the **Block -37 (Gaya Morhar -24)** sand Ghat has been approved with production capacity of **522000 cum per annum or 939600 TPA** from the Department of Mines & Geology, Govt. of Bihar through vide letter No.-**2290/M** Patna, dated **03/05/2023** under the Bihar Minor Minerals Concession Rules 2019. Copy of approval Letter of Mining Plan and Approved Mine Plan & Progressive Mine Closure Plan has attached as **Annexure II**.

Draft EIA Report for Proposed Sand Mining Project at Block-37 (Gaya Morhar-24) Sand Ghat on Morhar River, Area: 29.0 Hectares, Mauza- Babandih, Padaria, Pakri Guriya & Chuawar, Anchal- Imamganj, District- Gaya, State- Bihar.

Environment Consultant: The lessee has hired an Environment Consultant Rian Enviro Private Limited, H/O- 202 & 402, Mangal Market, Raza Bazar, Sheikhpura, Patna, Pincode: 800014 for preparation of Environment Impact Assessment Report for obtaining Environment Clearance from SEIAA, Bihar.

ToR Letter: It is in this context, hard copy of Form-I and Pre-Feasibility Report has been submitted to SEIAA, Bihar on **05.06.2023** requesting for issue of “Terms of Reference” (ToR). The ToR Letter has been issued on date **09.06.2023** by SEIAA, (File No. **SIA/1(a)/2435/2023**). Validity of TOR is for period of three years.

Baseline data collection: The baseline data was collected in summer season from 1st of March 2023 to 31st of May 2023.

1.3 Identification of Project and Project Proponent

1.3.1 Identification of Project

Mining of Minor mineral (Sand) from the river Morhar by **Dinanath Singh** having an area of **29.0 ha** with production capacity of **522000 cum per annum or 939600 TPA**. The mine is situated in the Mauza- Babandih, Padaria, Pakri Guriya & Chuawar, Block- Imamganj , District- Gaya, Bihar. The mine lease area falls in the survey of India Toposheet no.G45S6, G45S7, G45U10& G45U11.

1.3.2 Identification of Project Proponent

The applicant details are given below: -

Table No.1- 1: Applicant Details

Sl No.	Name of the Mine lease area	Applicant
1	Block-37 (Gaya Morhar-24) Sand Ghat	Dinanath Singh Add- Lasarhi, P.O- Agiaon, P.S.- Garhani, District- Bhojpur, State- Bihar.

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1.4 Environmental Clearance

The Proposed Sand Mining Project of **Block-37 (Gaya Morhar-24)** Sand Ghaton Morhar River, Area: **29.0 Hectares**, Khata no. 490,79,433,345,Khasra No.- 2720,592,2785/2835,1,Mauza- Babandih, Padaria, Pakri Guriya & Chuawar, Block - Imamganj, District- Gaya, State- Bihar, falls in Category “B1”, 1(a), due to Mining lease area is more than 5.0 Ha as per honorable NGT order and as per OM dated 12.12.2018. Project will be assessed by SEIAA, Bihar. Lessee will have to take Environmental Clearance from SEIAA, Bihar as per EIA notification September, 2006 amended in December 2009 and April 2011and amendment thereof to start the mining operation.

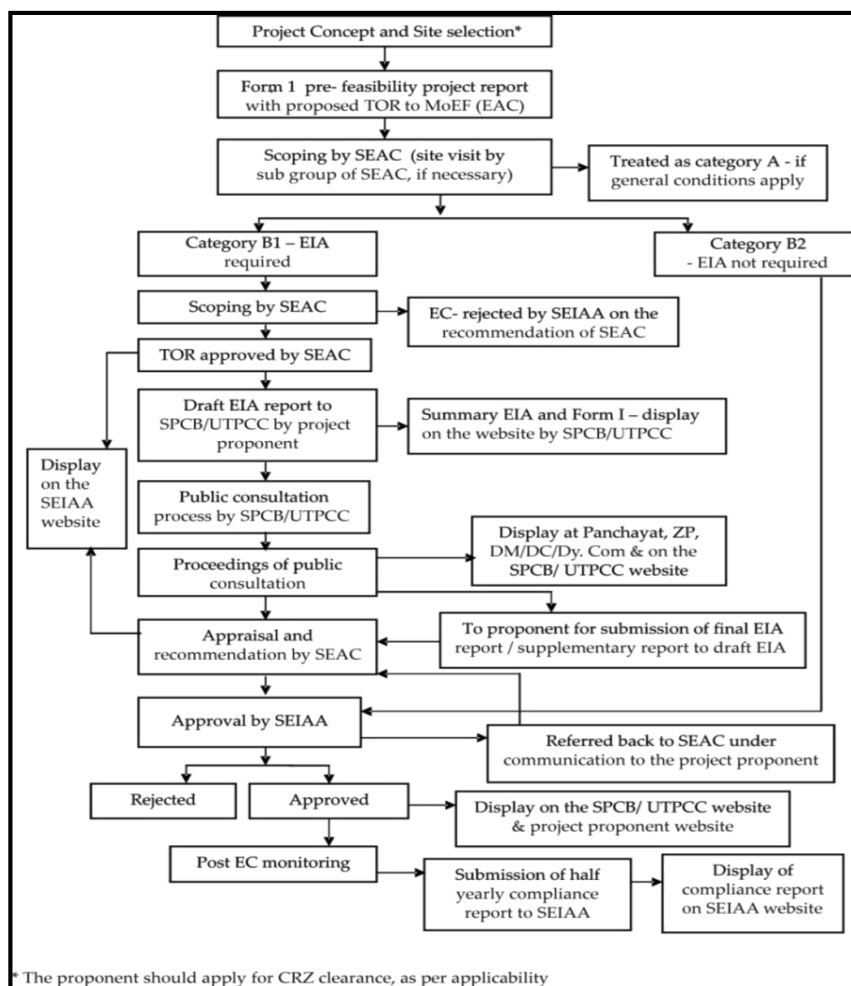


Figure. No.:1- 1: Environment Clearance Process

Draft EIA Report for Proposed Sand Mining Project at Block-37 (Gaya Morhar-24) Sand Ghat on Morhar River, Area: 29.0 Hectares, Mauza- Babandih, Padaria, Pakri Guriya & Chuawar, Anchal- Imamganj, District- Gaya, State- Bihar.

1.5 Brief Description of Nature, Size, Location of the Project

Table No.1- 2: Description of the Project

S. No.	Particulars	Details																									
1.	Nature and Size of the Project	Mining of Sand Minor Minerals with Production Capacity of 522000 cum per annum or 939600 TPA (M.L. Area- 29.0ha).																									
2.	Location																										
	Plot/Survey/Khasra No.	River Name	Mauza	Thana No.	Khasra No.	Khasra No.	Name of the Ghat	Area (Ha)																			
		Morhar	Babandih	314	490	2720	Block-37 (Gaya Morhar-24)	29.0																			
			Padaria	--	79	592																					
			Pakri Guriya	240	433	2785/2835																					
			Chuawar	--	345	1																					
	Village	Mauza- Babandih, Padaria, Pakri Guriya & Chuawar																									
	Block	Block- Imamganj																									
	District	Gaya																									
	State	Bihar																									
3.	Geographical Coordinates Latitude and Longitude of	Block-37 (Gaya Morhar-24) Sand Ghat, Area: 29.0 Ha, Coordinates: - <table><tr><td>Sl. No</td><td>Latitude</td><td>Longitude</td></tr><tr><td>1</td><td>24° 29' 20.96" N</td><td>84° 36' 28.86" E</td></tr><tr><td>2</td><td>24° 29' 16.89" N</td><td>84° 36' 31.34" E</td></tr><tr><td>3</td><td>24° 28' 50.51" N</td><td>84° 36' 0.40" E</td></tr><tr><td>4</td><td>24° 28' 54.11" N</td><td>84° 35' 55.88" E</td></tr></table>											Sl. No	Latitude	Longitude	1	24° 29' 20.96" N	84° 36' 28.86" E	2	24° 29' 16.89" N	84° 36' 31.34" E	3	24° 28' 50.51" N	84° 36' 0.40" E	4	24° 28' 54.11" N	84° 35' 55.88" E
Sl. No	Latitude	Longitude																									
1	24° 29' 20.96" N	84° 36' 28.86" E																									
2	24° 29' 16.89" N	84° 36' 31.34" E																									
3	24° 28' 50.51" N	84° 36' 0.40" E																									
4	24° 28' 54.11" N	84° 35' 55.88" E																									
4.	Toposheet (OSM) No.	G45S6, G45S7, G45U10 & G45U11																									
5.	Lease Area Details																										

Draft EIA Report for Proposed Sand Mining Project at Block-37 (Gaya Morhar-24) Sand Ghat on Morhar River, Area: 29.0 Hectares, Mauza- Babandih, Padaria, Pakri Guriya & Chuawar, Anchal- Imamganj, District- Gaya, State- Bihar.

	Lease Area	29.0 Ha.
	Type of Land	River bed of Morhar
	Topography	Undulated (Riverbed)
	Site Elevation Range	169.5ASML to 172.6 ASML
6.	Cost Details	
	Cost of the project	Rs. 1282.8 lakhs. (Including Auction Cost)
	Cost for EMP	7.05 Lakh (Capital Cost) & 10.44 Lakhs (Recurring Cost)
7.	Environmental Settings of the area	
	Ecological Sensitive Areas (National Park, Wild Life Sanctuary, Biosphere Reserve, Reserve/ Protected Forest etc.) within 10 Km radius	There is no any Ecological Sensitive Areas (National Park, Wild Life Sanctuary, Biosphere Reserve, Reserve/ Protected Forest etc.) within 10 Km radius.
	Nearest Town/ Major City with population	District Headquarter- Gaya, Approx 50.85 km in NE
	Nearest Railway Station	Rafiganj Railway Station, approx. 36.2 Km towards North.
	Nearest National/State Highway	SH-69, Approx. 0.34 km towards NW.
	Nearest Airport	Gaya International Airport, approx. 44.23 Km towards NE.
	Nearest Post Office	Post Office Pakri guriya, Apprx. 1.0 Km towards North.
	Medical Facilities	Bankey Bazar Hospital (PHC), TanrawaApprox. 5.19 Km towards West. Maa Bhagwati Hospital, TanrawaApprox. 6.52 km towards NE.
	Education Facilities	Primary School, Nagwan. Approx. 6.14 Km towards SSE. Vidya Public School, Pakri Guriya. Approx 0.45 km, towards North.
	Archaeological sites	There are noArchaeological sites within 10 km radius from project site.

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	Seismic Zone	Zone III (IS 1893: 2002)
	Water Body	Morhar River (Riverbed)

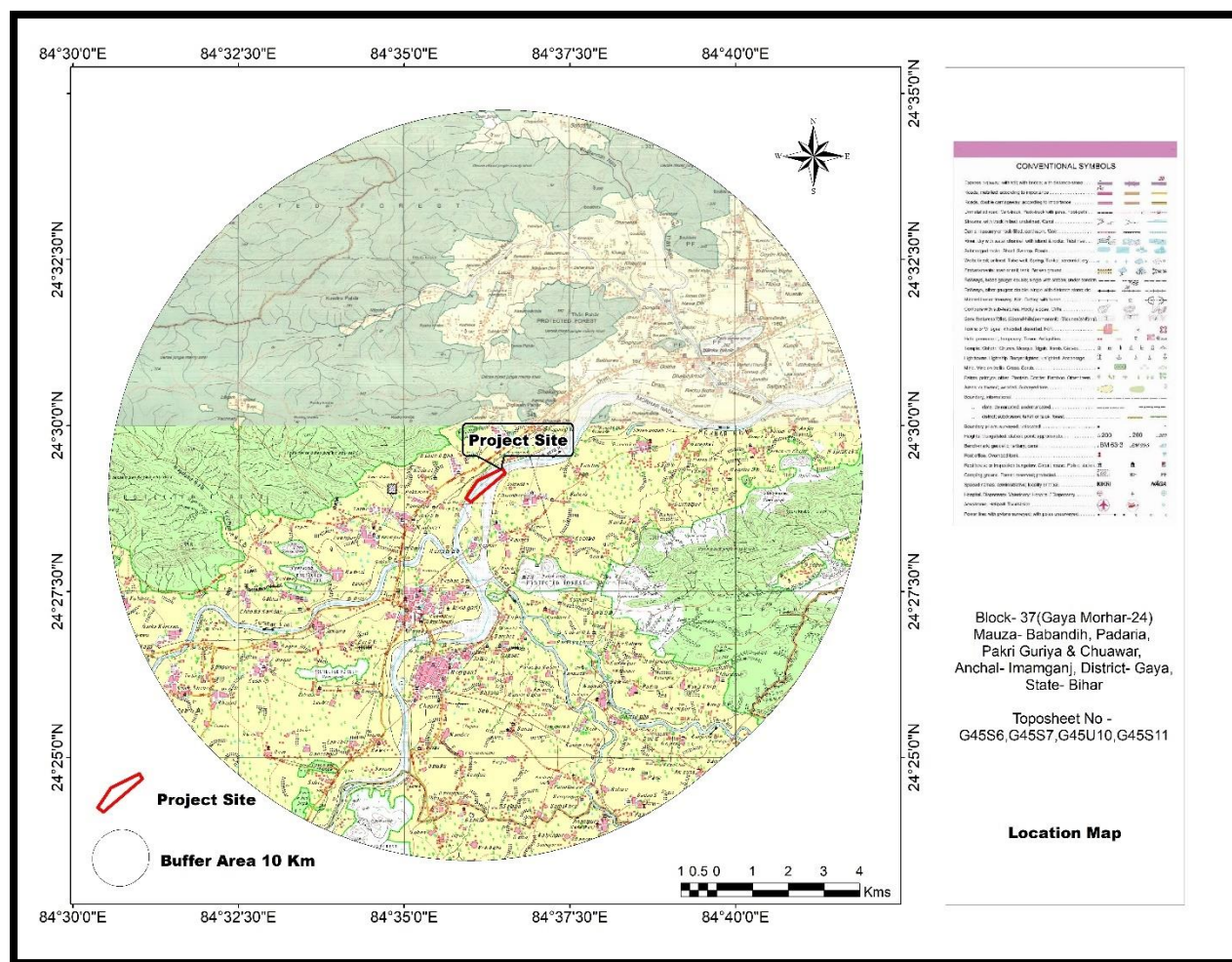


Figure. No.:1- 2: Toposheet map

1.6 Scope of Study

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

1.7 Preparation of EIA

The EIA includes the following details:

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

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

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

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

Chapter 1 – Introduction

The chapter provides description of project background, site and surroundings, objectives, scope and organization of the study and format of this report as well as Point Wise Term of Reference reply (TOR) Replies.

Chapter 2 – Project Description

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

Chapter 3– Description of the Environment

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

Chapter 4 – Anticipated Environmental Impacts and Mitigation Measures

In this chapter, the potential impacts of the proposed mining and allied activities, which could cause significant environmental concerns, are identified and discussed. This discussion will form the basis for environmental management activities.

Chapter 5 – Analysis of Alternatives (Technology and Site)

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

Chapter 6 – Environmental Monitoring Program

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

Chapter 7 – Additional Studies

This chapter will include outcomes of public consultation, risk assessment, social impact assessment, R&R action plan, biodiversity conservation plan, watershed management etc which will be studied in surrounding of the project area.

Chapter 8 – Project Benefits

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

Chapter 9: Environmental Cost Benefit Analysis - This chapter includes Project Cost, cost of pollution control facilities and project implementation schedule.

Chapter 10 – Environmental Management Plan

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

Chapter 11 – Summary

This will constitute the summary of EIA Report.

Chapter 12 – Disclosure of Consultant

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

1.8 Laws Applicable to This Project

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

- EIA Notification, 2006 under EPA Act, 1986.
- Bihar Sand Mining Policy-2019 as amended and Bihar Minerals (Concession, Prevention of Illegal Mining, Transportation & Storage) Rules, 2019 (as amended in 2021)
- The Mines and Mineral (Development and Regulation) Act, 1957.
- The Mines Act, 1952.
- Mines Rules, 1955.
- Mineral Concession Rules, 1960.
- Mineral Conservation and Development Rules, 1968
- The Water (Prevention & Control of Pollution) Acts 1974/ Rules 1975
- The Air (Prevention & Control of Pollution) Acts 1981/ Rules 1982
- The Environment (Protection) Acts 1986/ Rules 1986
- The Factory Act 1948 (as amended till 1987) & Bihar Factory Rules, 1950
- Contract Labor (Regulation & Abolition) Act 1970 & Its Central Rule 1971
- The Central Motor Vehicle Rules 1989 (Under Motor Vehicle Act 1988)
- The Workmen's Compensation Act 1923 as amended up to 2000/ Rule 1924, 1935, 1991 & 1996.
- Enforcement & Monitoring Guidelines for Sand Mining, 2020
- Sustainable Sand Mining Management Guideline, 2016

1.9 Term of Reference (ToR)

The project proposal was submitted to State Level Environment Impact Assessment Authority-Bihar for its appraisal. ToR of proposed Sand mining project has been issued by SEIAA; Bihar vide **File no-SIA/1(a)/2435/2023 dated 09-06-2023**. The compliance of ToR is described below.

Table No.1- 3: Point Wise Compliance for ToR

Sr. No.	TOR	Compliance
1	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.	This is the new auctioned sand mining Ghat project. LOI details Attached as Annexure I The operation will be started after obtaining environmental clearance.
2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.	State Govt. has given its consent to grant mining lease to the proponents. Copy of LOI are enclosed as Annexure No. I
3	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	The documents including mine plan and EIA being submitted are compatible with one another Mine Lease area- Block-37 (Gaya Morhar-24) Ghat- 29.0 Ha. Production Capacity: 522000 cum per annum or 939600 TPA. No mines waste will be generated as whole mined material is saleable. Approx. 4.5 Kg/day amount of Solid waste will be generated on the project site. The waste will be managed as per the Solid Waste Management Rules 2016. Separate bins will be provided near mine site. Mining Method-Opencast semi-mechanized. Refer Chapter-2 for all above information's.
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).	All Corner Coordinates of mining lease area superimposed on Map has been incorporated in EIA/EMPReport Refer Chapter-2, Figure no-2-3 The land-use of the study area with proper demarcated features is enclosed with the report, Refer Chapter-3, section-3.6
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	Land Use pattern & land use map is given in chapter 3, section-3.6, Figure No. 3-13.

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	minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	
6	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	The proposed land is a dry bed of river. The mining process will be done land use policy of the state & there is no land diversion has been proposed.
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 proponent Company has a well laid down Environment Policy. The hierarchical system or administrative order of the company has been given in the EIA report., Refer Chapter-10,
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.	Please refer to chapter 7 of EIA report
9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA	The 10 km zone from periphery of the lease has been considered as the study area. The Buffer map of the study area is attached with report. No waste will be generated except small amount of municipal

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		<p>solid waste, which will be managed as per law.</p> <p>All the details in the EIA report are for the life of the mine period. Refer Chapter-2.</p>
10	<p>Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.</p>	<p>Land use pattern of 10 km from the periphery of the lease area has been prepared and incorporated with the report. The study area lies in Morhar River. No National parks or WLS is found within 10 km study area, Refer Chapter-3. section 3.11.</p>
11	<p>Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use R&R issues, if any, should be given.</p>	<p>There is no overburden generated from this mining activity.</p>
12	<p>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.</p>	<p>There is no forest land within the lease area.</p>

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13	Status of forestry clearance for the broken-up area and virgin forestland involved in the Project including deposition of net present value (NPV) and Compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	No forest land is involved in the lease area; therefore, deposition of net present value (NPV) and compensated Afforestation is not indicated.
14	Implementation status of reorganization of forest rights under the schedule tribes and other traditional forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	There is no forest land involved in the leased-out area. Hence, this act is not applicable for this project.
15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	No RF/PF is present within the 10 km radius of the lease area. However, the vegetation details of the study area are incorporated with the report, Refer Chapter-3, section 3.11
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.	The details Impacts & their mitigation measures are given in chapter 4 of EIA/EMP Report.
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.	There is no any National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsarsite Tiger / Elephant Reserves within 10 km study area. Topomap on Survey of India topo sheet has been incorporated in EIA/EMP report. Refer Chapter-1, Fig- 1-2
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	Detailed biological study of core zone and buffer zone within 10 km radius of the periphery of the mine lease for flora fauna, endangered & endemic species has been incorporated in the EIA/EMP report. Refer Chapter-3, Section-3.11

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	<p>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.</p>	
19	<p>Proximity to areas declared as 'Critically Polluted' or the Project areas attracting court restrictions for mining operations, should also be indicated and where to 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.</p>	<p>This project is not coming in critically polluted area.</p>
20	<p>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).</p>	<p>This is not applicable.</p>
21	<p>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</p>	<p>This is a River Bed Mining Project.</p> <p>There are no inhabited areas in the allotted mine area which lies on the Morhar River, therefore no R&R Plan is proposed.</p>

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	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 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.	<p>Base line study was carried out for Summer Season from 1st March 2023 to 31st May 2023. Details are provided in Chapter-3 of EIA report.</p> <p>The locations of the monitoring stations were decided on the basis of prevailing micro - meteorological conditions (Wind direction & wind speed) of the study area.</p> <p>The wind rose has been given in chapter III of EIA/EMP Report. One location has been selected in downwind direction within 500 m from the lease boundary.</p> <p>The location of the monitoring sites has been shown in map.</p> <p>Refer Chapter- 3 & 4</p>
23	Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the	<p>Air quality modeling has been carried out for prediction of impact of the project on the air quality of the area. Air Modeling has been carried out for tracking impact of air pollutant due to mining activity as well as Transportation activity. Details of Air modeling is given in chapter 4 section 4.4.1</p>

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	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.	<p>The water requirement for the project is 6.17 KLD out of which 5.0 KLD for dust suppression and 0.3 KLD for use for domestic purpose and 0.87 KLD for plantation</p> <p>A detailed water balance is being provided in the report. Refer Chapter-2, Table-2.6</p>
25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Water requirement will be fulfilled by private water tanker. So, no clearance is required.
26	Description of water conservation measures proposed to be adopted in the Project should be given.	<p>The project does not consume any process water except for drinking, dust suppression & plantation. Plantation is proposed, which will increase the water holding capacity & help in recharging of ground water.</p> <p>No artificial rainwater harvesting is proposed for the present project in lease area.</p>
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.	<p>Mining activity will be done on Dry Bed of River so there is no impact on surface water.</p> <p>Mining will be up to 3 m below ground level or above the ground water table whichever comes first. This will not intersect the ground water table.</p>
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.	<p>No groundwater will be intersected during mining activity.</p> <p>Please refer to section 10.5 of Chapter 10 of EIA</p>
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.	The project site lies on Morhar River. No diversion is proposed.

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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.	The Elevation of the applied area is 169.5 ASML to 172.6 ASML in the stretch. Mining will be up to 3 m below ground level or above the ground water table whichever comes first.
31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and Quantities 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.	Plantation/afforestation will be done as per program i.e., along the road sides and near civic amenities, as per mine plan. Post plantation, the area will be regularly monitored in every season for evaluation of success rate. List of plants selected for green belt development if incorporated in Chapter-4. Section-4.6 under Table-4.5
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.	Trucks/ Tractor will be used for carrying the minerals per day from all the sand ghats . The projection has been done based on the mineral transportation. The details of traffic analysis are discussed in the report. Refer Chapter-3 under section 3.13

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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. Details are given in the EIA/EMP Report. Refer Chapter-2.
34	Conceptual post mining land use and Reclamation and Restoration of mined out area (with plans and with adequate number of sections) should be given in the EIA report.	Refer to Chapter 2
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 due to air pollution due to fugitive dust emission because of movement of vehicles. However appropriate mitigation measures for air pollution control have been given in the report, discussed in Chapter-10. Each labour will undergo pre-placement medical examination. Thereafter periodical health checkup will be arranged as stated in the report. Refer Chapter-10, Table-10-2 for budgetary allocation.
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.	The proposed project being a small scale semi-mechanized mining project, there will be hardly any process related health implication on the population of the nearby villages except fugitive dust emissions due to transportation. Budgetary allocation is given in Chapter-10 . However protective equipment's will be provided & health camps & awareness programs will be arranged for them. Details are given in report. Refer Chapter-10.
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 to time for implementation.	Socio-economic significance provided to the local community i.e., to the nearby villagers is given in the EIA/EMP Report, Refer. Chapter-10, Section- 10.8
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	The detailed environmental management plan to mitigate the environmental impacts has been mentioned in of the EIA/EMP Report. Refer Chapter-10.

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	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.	<p>This is Draft EIA report, public hearing yet to be conducted.</p> <p>The PH Proceeding along with details will be submitted with Final EIA Report.</p>						
40	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No litigation is 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.	<p>The capital cost of 7.05 Lakhs for capital and 10.44 Lakhs recurring cost has been earmarked for EMP. Refer, Chapter-10. Table-10.3</p> <table border="1"> <thead> <tr> <th>Name of Ghat</th><th>Capital Cost(Lakh)</th><th>Recurring Cost (Lakh)</th></tr> </thead> <tbody> <tr> <td>Block-37 (Gaya Morhar-24)</td><td>7.05</td><td>10.44</td></tr> </tbody> </table>	Name of Ghat	Capital Cost(Lakh)	Recurring Cost (Lakh)	Block-37 (Gaya Morhar-24)	7.05	10.44
Name of Ghat	Capital Cost(Lakh)	Recurring Cost (Lakh)						
Block-37 (Gaya Morhar-24)	7.05	10.44						
42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	A Disaster Management Plan has been given in EIA report. Refer Chapter-7, Section 7.7						
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.	<p>Benefits of the project is discussed in detail under Chapter -8</p> <p>As per MoEFCC OM dated 30th Sept., 2020 adequate funds shall be earmarked as per the commitments made by project proponent and requirements to address the issues raised during the public hearing in lieu of corporate Environment Responsibility (CER) and this will be covered under EMP. Detailed action plan for the activities along with the budgetary allocation will be incorporated in this EIA/EMP Report upon completion of public hearing.</p>						
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.	All documents are 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.	Complied with EIA Report.						

Draft EIA Report for Proposed Sand Mining Project at Block-37 (Gaya Morhar-24) Sand Ghat on Morhar River, Area: 29.0 Hectares, Mauza- Babandih, Padaria, Pakri Guriya & Chuawar, Anchal- Imamganj, District- Gaya, State- Bihar.

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.	Details of testing reports of air, water, soil & noise have been enclosed in EIA report. Refer Chapter-3. Monitoring reports will be submitted along with Final EIA report.
d)	Where the document provided are in language other than English, an English translation should be provided.	Executive summary and Hindi Executive Summary is attached as Annexure VI & VII.
e)	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	Complied
f)	While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J/11013/41/2006/- IA.II(I) dated 4th August, 2009, which are available on the website of this ministry should be followed.	All the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J/11013/41/2006/- IA.II(I) dated 4th August, 2009 are being 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 then revised documentation.	Agreed & complied.
h)	As per the circular no. J-1 1011/618/2010-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	The EC points will be complied after grant of EC.

**Draft EIA Report for Proposed Sand Mining Project at Block-37 (Gaya Morhar-24)
Sand Ghat on Morhar River, Area: 29.0 Hectares, Mauza- Babandih, Padaria, Pakri
Guriya & Chuawar, Anchal- Imamganj, District- Gaya, State- Bihar.**

	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.	Surface plan cum geological section, geological is given in Chapter 2, Figure No. 2-4
	Additional Specific Conditions	
1	Submit a report based on cumulative assessment of increase in air pollutants due to increase in traffic load in view of proposed mining activities on all the roads located within aerial distance of 10 km using suitable air model.	Cumulative assessment of increase in air pollutants due to increase in traffic load in view of proposed mining activities on all the roads located within aerial distance of 10 km using suitable air model has been done. Please refer to chapter 4.
2	If the proposed mining lease is overlapping with the previously allotted mining lease or already working or worked out mining lease, the same must be clearly shown (on the map). The details about quantity of sand extracted from overlapped area should also be furnished duly certified from the concerned District Mining Officer.	The Mining Ghat is proposed as per the approved DSR.
3	The Satellite imageries (high resolution) of last three years in succession for summer, rainy and winter seasons of each proposed mining lease shall be submitted. A map on appropriate scale be submitted to show extraction paths to be used outside the mining lease boundary to approach major public roads (Rural/District Road or State/National Highway).	Google Image of is shown in Figure No. 2-1 of Chapter 2 . The Satellite imageries of last three years is attached in Annexure IV .
4	Alternative route shall be explored if extraction path is passing through dense population / human settlements.	Map showing extraction path to be used outside the mining lease area to approach major public roads is attached as Figure 3-19 chapter 3 .
5	A Cumulative traffic management plan for cluster sand mining proposal must be submitted.	Please refer to Chapter 3, Section 3.13 & chapter 4 Section 4.10
6	A map of the area falling within 2.5 km radius from boundary of each	A map of the area falling within 2.5 km radius from boundary of each mining lease showing all man-made public utility

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	mining lease showing all man-made public utility features such as bridge/public civil structure (including water intake points), culverts etc. and highways, and a table showing distance of the above-mentioned man-made features from the mining lease boundary to facilitate decision making pertaining to relevant rules / Guidelines be submitted.	features such as bridge/public civil structure (including water intake points), culverts etc. and highways is attached in Annexure V
7	A report of the cumulative EIA / EMP study for the cluster sand mining blocks of the proposed mining site.	There is no lease within periphery of 500m. (As per LOI, vide letter No.- 5511/Khanan, Gayadated 29-11-2022).

2 PROJECT DESCRIPTION

2.1 General

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

2.2 Type of the Project

The project is proposed for mining of “Sand” from the allotted mine lease area on River Morhar. It is an opencast Semi mechanized mining project. **Dinanath Singh Add- Lasarhi, P.O- Agion, P.S.- Garhani, District- Bhojpur, State- Bihar** is the project proponent who is seeking prior environmental clearance for the proposed project.

The proposed project planning needs “Environmental Clearance” from the MoEF & CC, as per the EIA Notification, 2006. The Proposed Sand Mining Project of **Block-37 (Gaya Morhar-24)** on Morhar River, Area: **29.0 Hectares** is classified under Category B-1 as 1(a) “Mining of minerals” due to Mining lease area is more than 5.0 Ha as per honorable NGT order and as per OM dated 12.12.2018.

2.3 Need for the Project

Sand is used in almost any type of construction activity. It is also the most important input in domestic activity. Further, the material can also be used for nonindustrial purposes. Thus, in current times, where the focus of the governments is on improvement of basic infrastructure like roads, railways, dams and other social infrastructure – both in rural and urban areas, there is a constant need for ensuring regular supply of these minor minerals.

2.4 Description of the Project

The Proposed Sand Mining Project at **Block-37 (Gaya Morhar-24)** sand ghat, Thana No. 314, 240 Khata No.- 490, 79, 433, 345, Khesra No.- 2720, 592, 2785/2835, 1, Mauza- Babandih, Padaria, Pakri Guriya & Chuawar, Anchal- Imamganj, District- Gaya, State- Bihar. for production capacity of **522000 cum per annum or 939600 TPA** over an area of **29.0 Ha or 71.63 Acre**.

Table No.:2- 1: Location Details

River Name	Khata No.	KhasraNo.	Name of the Ghat	Area(Ha)
Morhar	490, 79, 433, 345	2720, 592, 2785/2835,1	Block-37 (Gaya Morhar-24)	29.0

2.4.1 Location Details

Table No.:2- 2: Location of the Project

Location	Block-37 (Gaya Morhar-24)Ghat: -		
	Sl. No	Latitude	Longitude
	1	24° 29' 20.96" N	84° 36' 28.86" E
	2	24° 29' 16.89" N	84° 36' 31.34" E
	3	24° 28' 50.51" N	84° 36' 0.40" E
	4	24° 28' 54.11" N	84° 35' 55.88" E
	Block-37 (Gaya Morhar-24) on Morhar River Mauza- Babandih, Padaria, Pakri Guriya & Chuawar, Anchal- Imamganj, District- Gaya, State- Bihar		
Toposheet Number	G45S6, G45S7, G45U10 & G45U11		
Nearest Settlements	Chuawar, approx.0.86 Km towards SE.		
Nearest Highway	SH-69, Approx. 0.34 km towards NW.		
Nearest Railway Station	Rafiganj Railway Station, approx. 36.17 Km towards North		
Nearest Airport	Gaya International Airport, approx. 44.23 Km towards NE.		
Nearest River	Morhar River		

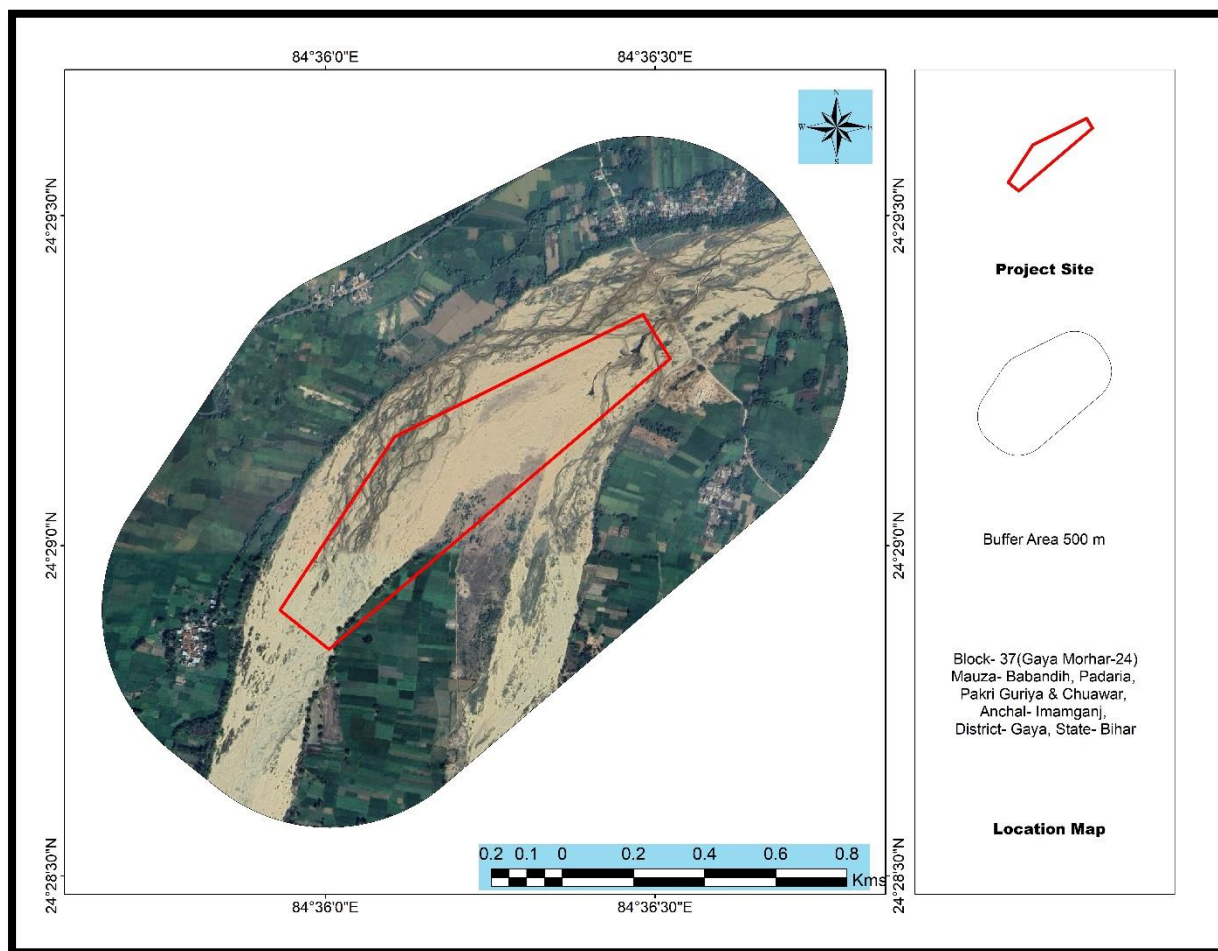


Figure 2- 1: 500 m Buffer Google Map

The location map and pillar co-ordinate maps of the project site is given below:

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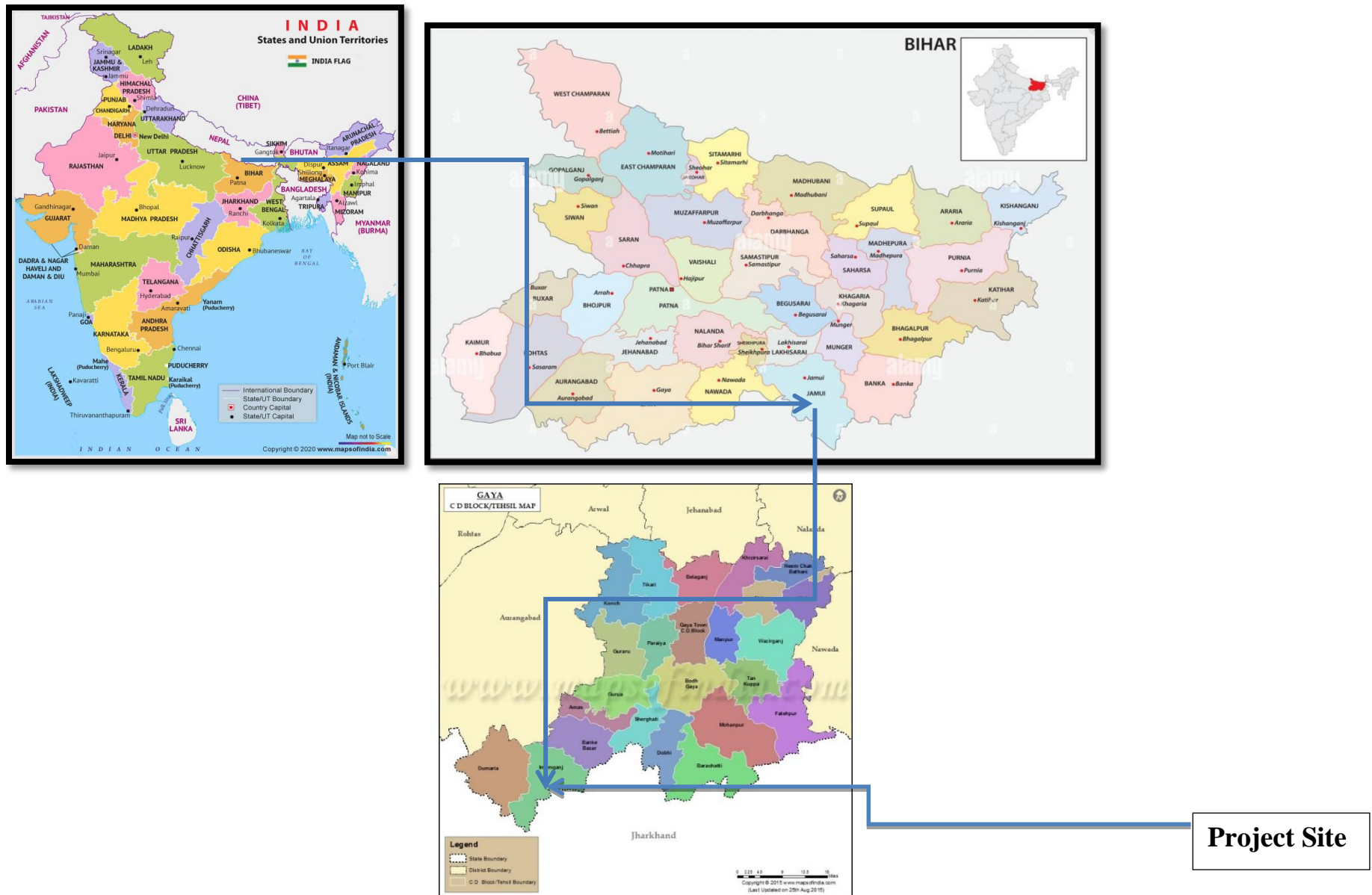


Figure 2- 2: Location Map of the Project Site

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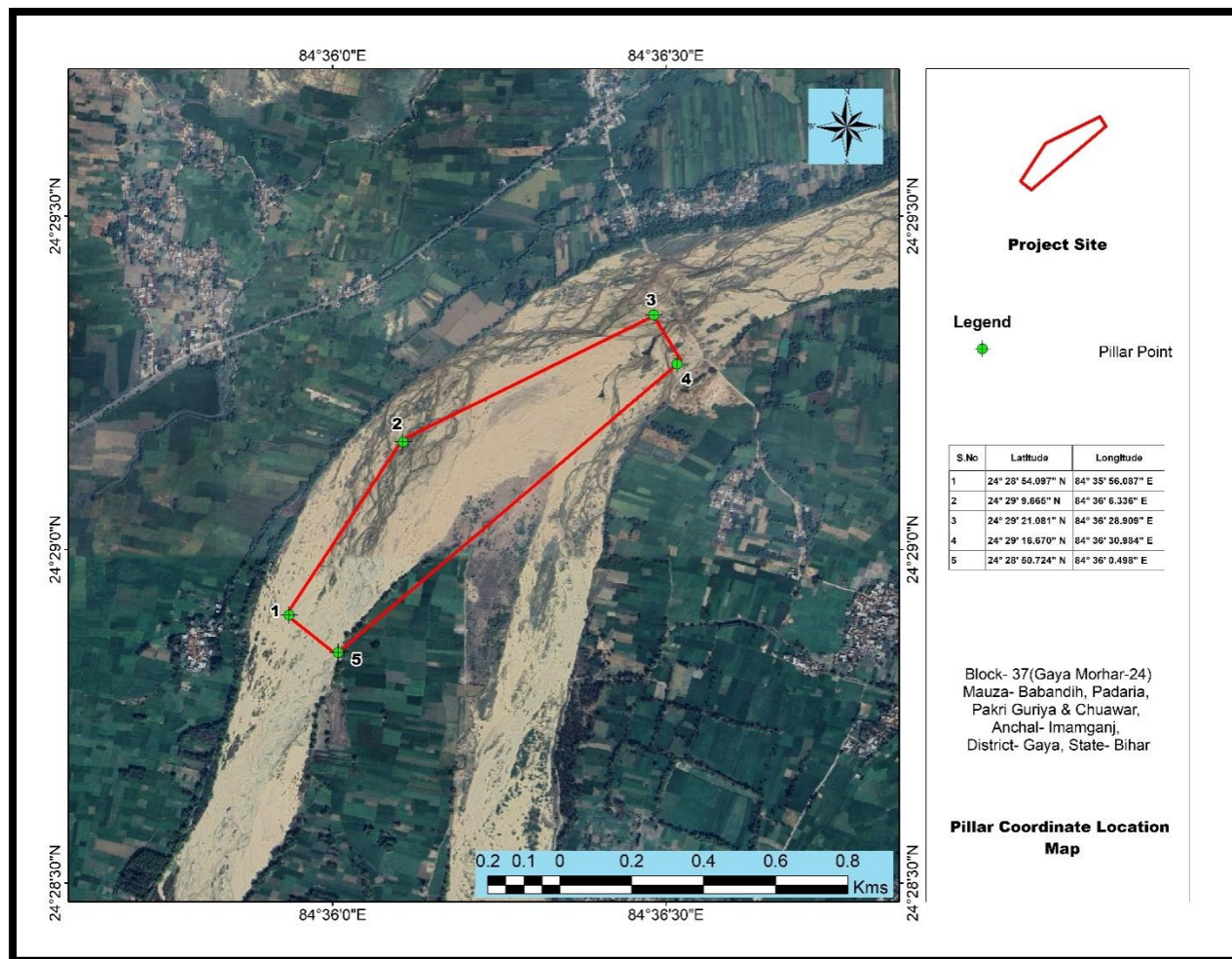


Figure 2- 3: Pillar co-ordinate map of the Project Site

2.5 Available Reserves and Production

2.5.1 Geological Reserves

The geological reserves have been each stretches & for individual blocks. Geological reserves have been completed through cross sectional area method. Thea area of each section line is multiplied by strike influence to get the volume.

Proved Mineral Reserve (111): All quantities of sand occurring up to depth of 3 m from surface has been considered as proved reserves.

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Classification	Code	Quantity of Sand
B) Mineral Reserves		Cum
2) Proved Mineral Reserves	111	870000
Total		870000

Total Geological Reserve= 870000 cum. Or 1566000.

*Bulk density is 1.8 g/cm³

The geological reserves of the sand have been estimated keeping the river water level as ultimate Pit Level where the mining for sand shall cease. Considering 7.5 meter of safety zone all along the lease boundary, effective area for resource calculations has been done. Resources are falling in measured (331) category while, pit slope resources are considered as 221 categories and are termed as blocked resources. After deductions of the blocked resources, remaining resources are considered as mineable and is categorized as 211 as per UNFC because the feasibility and economic axis are already analyzed prior to auction.

2.5.2 Local Geology

The area is dominated by medium to fine sand geologically the area comprising of Terrace alluvium deposited in depositional terraces of old rivers & contain cyclic sequence of fine to coarse grained sand. It is angular to sub angular and the angularity of the grains of this category of sand decreases with depth.

River bed sand mining shall be restricted within the central 3/4th width of the river/rivulet or 7.5 meters (inward) from river banks but up to 10% of the width of the river. Mandatory distance to be left from both banks of river channel is kept in mind while deriving the mineable reserves from the geological reserves.

Table No.:2- 3: Geological and Minable Reserve Estimation

S. No.	Particulars	Details
1.	Name of Sand Ghat	Block-37 (Gaya Morhar-24)
2.	Total ML Area in Hectare	29.0
3.	Average Depth (m)	3
4.	Sp. gr. of sand	1.8
5.	Geological reserves of sand cu. m	870000
6.	Geological reserves (tonnes)	1566000

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7.	Mineablereservescu.m.	753243
8.	Mineable Reserves (tonnes)	1355837

2.5.3 Targeted Production

Year wise sand reserve according to EMGSM guideline is given below the targeted production is 522000cum per year.

Serial Year	Production in Cum
Year-1	522000
Year-2	522000
Year-3	522000
Year-4	522000
Year-5	522000
Total	2610000

2.5.4 Life of Mine

It is presumed that the mineral will be replenished every year during the rainy season. New mineral will be added every year in the river bed. The present reserves are sufficient for the proposed rate of production.

[Source: Approved Mine Plan](#)

2.6 Mine Drainage

During the course of mining, the water table in the river shall not be intercepted. The mining shall be restricted to the top 3 m from the general ground level.

Ground water shall not be intercepted during the mining of sand. In view of it, dewatering of sand pits shall not be required or discharged elsewhere.

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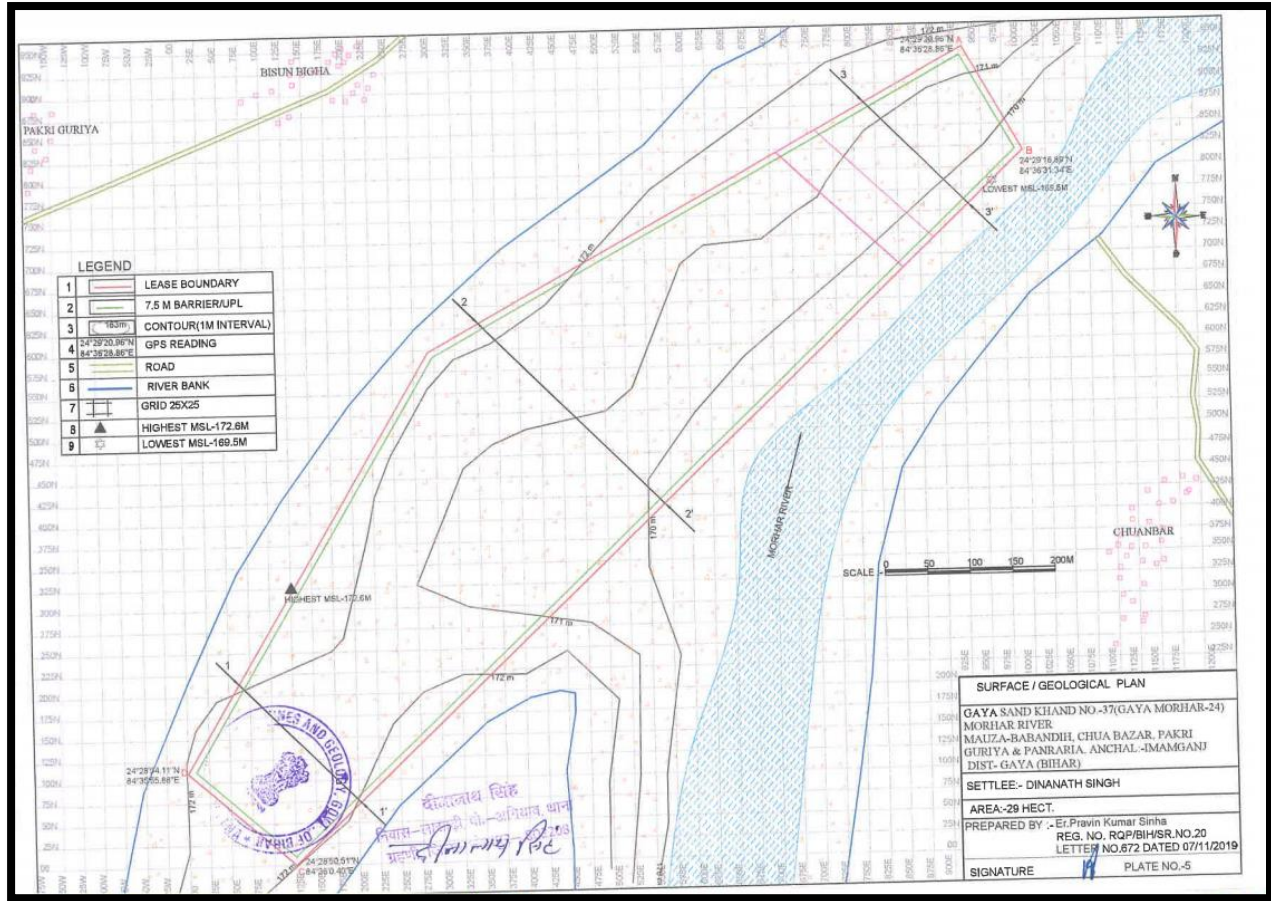


Figure 2- 4: Surface/Geological Plan of Block 37 (Gaya Morhar-24) Balu Ghat

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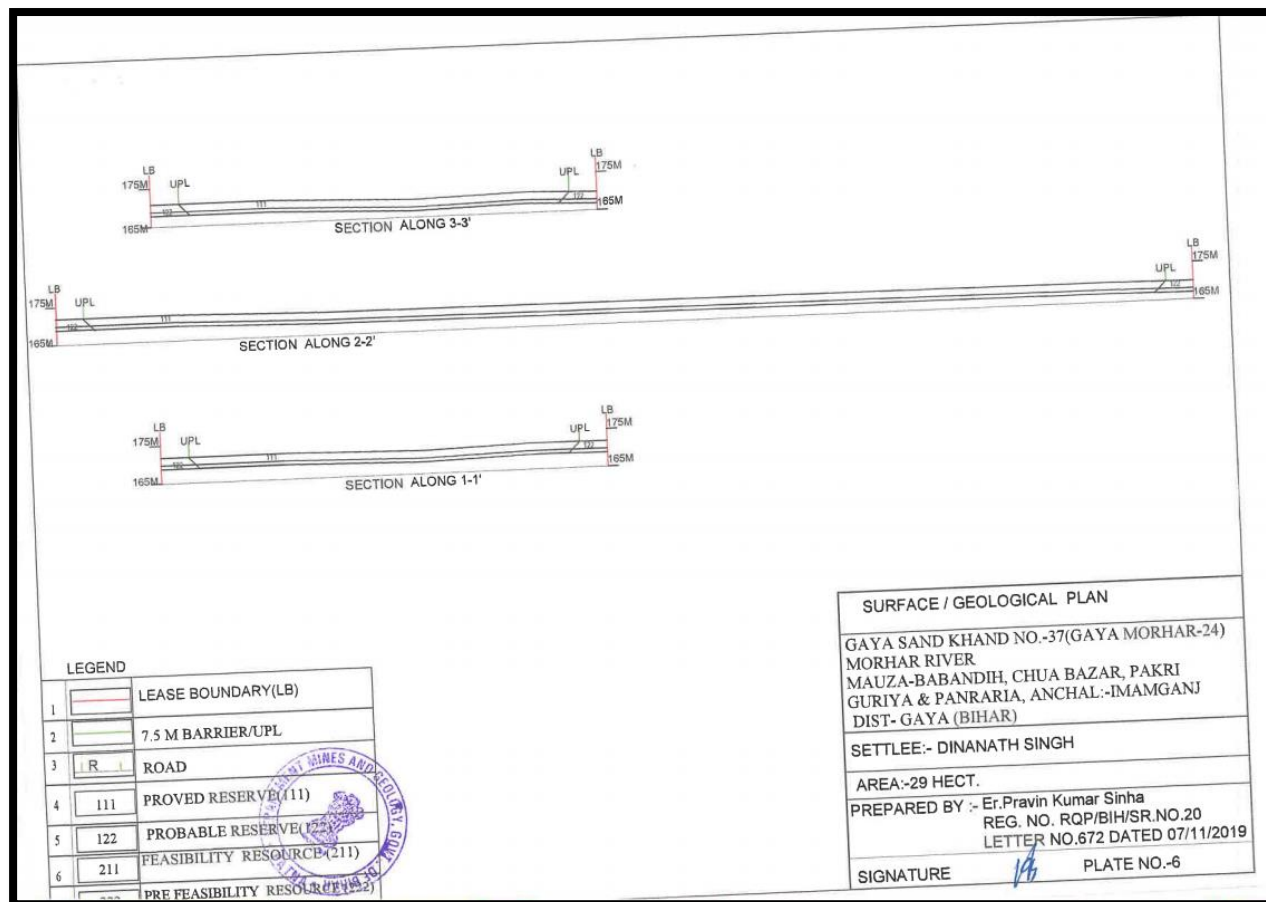


Figure 2- 5: Surface/Geological section of Block 37 (Gaya Morhar-24) Balu Ghat

2.7 Method Mining

2.7.1 Proposed Mining Method –Semi Mechanized Mining.

1. The mining for the entire stretch of proposed sand ghats of river Morhar, using Semi-Mechanized Method comprising use of crawler mounted JCB / Poclain back hoe (bucket capacity varying between 0.42m³ to 1.2 m³ depending upon the quantity of sand reserves) for primary excavation/winning and loading of sand, and JCB loader for secondary loading of sand on the river banks. Trucks or tippers of 12 metric tonne capacity and requisite manpower shall be put to use to support the operating machinery.
2. The mining lease area shall be demarcated and pillars of appropriate material shall be erected at reasonable distance to identify the same. The distance of 7.5 m shall be further

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marked from the lease boundary and this zone constituting the 'safety zone' shall be identified.

3. The excavated sand shall be sieved at pit head to remove the silt load washed in. It shall be used in making river bank embankment to raise the bank height. This shall prevent flooding of adjoining areas.
4. The sand only fraction shall be loaded primarily at the pit head and unloaded at the secondary loading point/location on the river bank.
5. At the secondary loading point requisite, no of JCB loaders shall be deployed as given in Table to follow. The secondary loading operations shall be day and night in order to meet the demands.
6. No mining activities shall be undertaken within this 'safety zone'. This shall be in accordance of Metalliferous Mines Regulations 1961 (MMR-1961) vide Chapter-XI sr.no. 111 and section 3[(2)].
7. The sand shall be mined out in successive vertical benches/slices from top of ground surface or sand surface downwards, and shall be 1.0 meter thick.
8. At no point of time the vertical mine face shall be more than 1.0 m high. Further, the width of the bench shall be minimum 1.5 m in width in horizontal plane in accordance with the MMR-1961 sub rules. This shall prevent development of mine face more than 1.0 m high which may be cause of concern from the safety aspects. This is important to prevent machine operators/ workers from falling into the pit while working near the machinery.
9. The mining operations shall be performed between sunrise to sun set hours.
10. The use of semi mechanized mining shall require use of electricity to illuminate the working area and accordingly electricity shall be tapped after grant of due approval / permission from competent authorities concerned.

2.7.2 Conceptual Plan of Mining

The lease period for Five years from the date of execution. Considering individual sand deposits and restricting the mining to top 3 m from the present ground surface, the sand deposit shall be worked upon upto a depth of 3 m. The mining shall cease at a depth of 3 m. A pole (wooden or metal) shall be fixed in the sand deposit at a suitable location, with datum levels - 0m to 3m

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painted on it to work as a guide in depth restriction. The river channel is free of water and the ground water table lies about 6-8 m below the dry channel of the river exposed. In general, this condition prevails in almost all of the sand deposits on this river stretch.

The mineralized zone or the sand zone in particular of the river does not follow any specific trend. It occurs as lensoid body. The relative occurrence of ground surface with the sand zone thickness varies from place to place and depends upon factors such as stream/river flow characteristics, geometry of the river banks, sediment load, rate of water flow, rainfall and surface run off characteristics etc. However, due to UNFC guidelines on reserve estimation, sand reserves have been considered too few meters below the minable depth of 3m.

In view of this, it is not possible to prepare a conceptual plan due to lack of specific spatial trend of the sand zone.

The longitudinal section of the river channel is explained in the Figure 2-6 given below. The longitudinal section exhibits the generic upstream to downstream flow of river along with the sand deposits contained with it. AS seen in the illustration, the top surface of the sand deposit is undulating and gently dipping and the contours of sand deposit vary with the factors an enumerated in above paragraph.

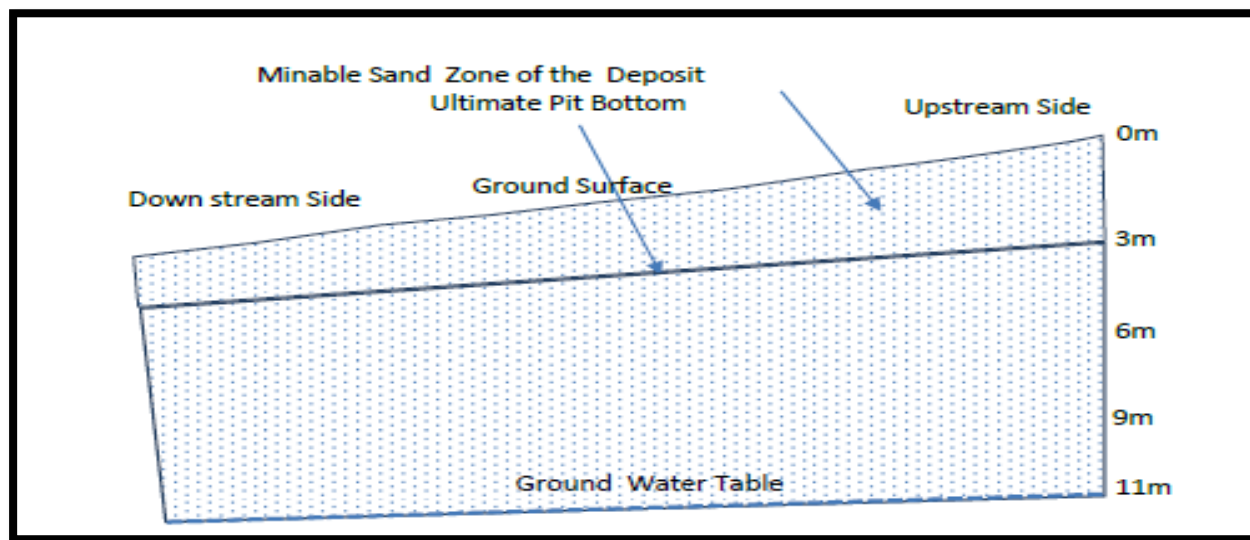


Figure 2- 6: Conceptual Longitudinal Section of River Channel

2.7.3 Machinery Requirement

This is a new mining contract. Following equipment's are proposed to be deployed for the desired production.

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Table No.:2- 4: List of Machinery

S. L. No.	Name of Machinery	Capacity	Max. Nos.	Fuel Consumptions (Lit Per Hour)	Fuel Consumption in day (Liters)
1	JCB/ Shovel	1.00 m ³	2	8 Ltr. /hr.	160
	Excavator	2.0 m ³	5	8 Ltr. /hr.	640
2	Trucks/Tippers	12 tonnes	250	4 Ltr. /hr.	8000
3	Tractors	4 tonnes	190	2 Ltr. /hr.	3040
4	Water Tanker	4000 liters	1	4 Ltr. /hr.	40
5	Extra vehicles	As per requirement	1	4 Ltr. /hr.	50
			TOTAL		11930

2.8 Transportation of Minerals

Mineral Sand will be transported by trucks. Loaded trucks will travel on Kaccha road made for plying of trucks. The temporary road will provide access to the river bed and the movement of loaded trucks. The village has its outlet meeting the tar road on the nearby villages and from where the mineral is sent to various destinations. Similarly, mineral will be transported on the other side through approach roads which finally merge with tar roads for final destinations.

2.9 Stacking of Mineral Rejects and Disposal of Waste

The present sand mining locations do not have significant top soil/clay layer to be preserved elsewhere during the mining operations.

The sand deposits inherit gravels, pebbles with them being a part and parcel of river system. During the field visit and information gathered during discussions with concerned people, 5% of the geological reserves occurring in the sand ghats are provided for these inclusions and accordingly these have been considered during the minable sand reserves.

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2.9.1 Disposal of Waste (Reject) materials Silt

The proposed project is the mining of sand from dry part of riverbed, all the excavated material will be saleable, therefore no mines reject will be generated. Some amount of silt may generate will be used in haul road development.

2.10 Use of Mineral

Deposit is moderate to good quality Sand. It is widely used in construction, buildings, bridges and other infrastructure. It is free from clay and non-sticky in nature.

(Source: Approved Mine Plan)

2.11 Utilities and Proposed Site Facilities

2.11.1 Manpower

Total manpower required for the project will be **30** Workers. Break up of manpower requirement is given below.

Table No.:2- 5: Manpower Details

Category	Total Manpower
Administration	2
Supervisor	2
Skilled	6
Un- Skilled	20
Total	30

2.11.2 Water Requirement

The total water requirement will be **6.17KLD**. This water will be supplied by private tankers.

Drinking water will be made available at site by the private tankers.

The details of Water uses are given below:

Table No.:2- 6: Water Requirement

Activity	Water Requirement (in KLD)
Dust suppression	5.0
Domestic	0.3
Green Belt Development	0.87
Total	6.17

2.11.3 Power

The material will be excavated by open cast semi method and loaded directly into tractors by the workers themselves. The operation will be done only from sun rise to sun set. So, there is no power requirement for the mining activity.

2.12 Infrastructure and Site Facilities

Infrastructure facilities like site office, first aid station, rest shelter, potable drinking water facility etc. will be established within the mine area. The following infrastructure facilities will be made available for the workers.

a. First Aid Facility

A first aid facility will be made available at site with proper equipment will be maintained as per Mines Act and Mine Rules at the mine site office. First aid -box with all necessary facilities will be maintained and provided.

b. Temporary rest shelter

The Temporary rest shelter for the workers working in the mine and also to provide tea etc. as the laborers will come from nearby villages at day time only.

c. Washroom

The mobile toilet along with Mobile STP will be provided for sanitation purposes to the laborers nearby the site.

2.13 Sources of Pollution and Control Measures

a) Air Pollution

There will be impact on air up to a certain limit due to dust generation during loading operation, transportation of Sand. Similarly, due to mining operation noise pollution will be there, due to movement of transportation vehicles. However effective measures shall be taken to maintain the pollution limit within prescribed CPCB guidelines.

- ✓ Water sprinkling will be done on the haul roads twice in a day.
- ✓ Speed limits will be enforced to reduce airborne fugitive dust from vehicular traffic.
- ✓ Spillage from the trucks will be prevented by covering tarpaulin over the trucks.
- ✓ Deploying PUC certified vehicles to reduce their emissions.
- ✓ Plantation will be done on both sides of the road.

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b) Noise Pollution

The proposed mining activity is semi-mechanized in nature. No drilling & blasting is envisaged for the mining activity. Hence, the only impact is anticipated is due to movement of vehicles deployed for transportation of minerals.

- ✓ Proper maintenance of vehicles will be done to minimize the noise pollution. Pollution under Control certificates will be maintained for the trucks.
- ✓ Unnecessary Blowing of horn will be avoided.

c) Solid Waste

Solid waste will be generated on the project site approx. **4.5 Kg/day**. The waste will be managed as per the Solid Waste Management Rules 2016.

d) Green Belt Development

Total of 290 trees will be planted with various types of species. Details of greenbelt development along with number of plants is given below:

Table No.:2- 7: Details of greenbelt development

Sl.No.	River Name	Name of Ghats	Mining Area in Ha	No. of Saplings@10/Ha.	Cost in Rs.
1	Morhar	Block-37 (Gaya Morhar-24)	29.0	290	87000
Total			29.0	290	87000

2.14 Project Cost

The project proponent will incur a total cost of Rs. **1,282.8 Lakh** and may vary from place to place and with magnitude of the sand mining. This will include cost of labour, cost of transportation, fuel charges etc.

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Table No.:2- 8: Breakup of Proposed Project Cost

S. No.	Description	Cost in Lakh
1	Auction cost	1,252.8/-
2	Cost of Labour & Equipment	29.0 /-
3	Miscellaneous	1.0/-
TOTAL		1,282.8
EMP Budget		7.05
Grand Total		1,289.85

3 DESCRIPTION OF ENVIRONMENT

3.1 General

Sand is site specific mineral, which occurs mostly along the river beds and flood plain. Mining activities invariably affect the existing environmental status of the site. It has its own pros and cons and in order to maintain the environmental commensuration with the mining operation, it is essential to undertake studies on the existing environmental scenario and assess the impact on different environmental components.

3.2 Study area

The study area is divided into core and buffer zone in view of scientific study. The core zone is the lease area of the mining site and from the boundary of the lease area upto 10 km radius is called buffer zone. The study of the proposed project was undertaken for assessing the base line status of Environmental Parameters like Land, Air, Water (both ground and surface), Soil, Noise and Biological (both flora and fauna) and socio-economic status.

Baseline data has been collected out during the Summer Season **1st March 2023 to 31st May 2023** by ENVIRO-TECH SERVICES. NABL & MOEF accredited Lab. Correspondence address & Lab: -Plot No. 1/32, South Side G.T. Road Industrial Area Ghaziabad (UP)-201001. Head Office: - G-232, M.G. Road Industrial Area, Harpur -Ghaziabad (UP)-201015, in accordance with the Guidelines for EIA issued by the Ministry of Environment Forests and Climate Change, Govt. of India and CPCB, New Delhi. Team of Experts visited the study area for Social & Biological Environment study. The following data, through field survey and other sources, has been collected by ENVIRO-TECH SERVICES, for preparing the EIA/EMP for the proposed mining area with related facilities.

- Physical environment (Air, Water, Soil and Noise) baseline data.
- Relevant meteorological data, for previous decades from Indian Meteorological Department (IMD) and primary data.
- Identification of water bodies, hills, roads etc. within 10 Km radius.
- Eco-sensitive places, sanctuaries, biosphere reserves within 10 Km radius.
- Religious places / historical monuments and tourist places within 10 Km radius.
- Study of present environmental protection and mitigation measures in nearby operating similar projects, if any.

3.3 Geological Profile of the Area

3.3.1 Topography of the Area

The district of Gaya is broadly divided into two distinct physical units. The south is a region of broken undulating country merging into long ranges of hills, with a wide belt of brushwood, jungle at their base. Much of this tract is high and barren and incapable of much cultivations; the soil has poor crops and the population is sparse. These high lands project into the alluvial plains to the north as spurs from the C Chotanagpur Plateau. The greater part of the district, however, consists of the flat alluvial plain. This wide alluvial plain of the north forms part of the Gangetic depression with alluvial deposits of immense depth and is broken here and there by groups and low ranges of hills or isolated peaks arising abruptly from the level country at their feet. The alluvial plain is protected from drought by a wonderful system of indigenous irrigation consisting of ahars (reservoirs) and pains(channels). It is, therefore, a region of great fertility when compared with the southern part of the district and is comparatively densely populated. The northern portion, which is highly cultivated and extensively irrigated.

(Source: Approved DSR, Gaya).

3.3.2 Geology

The main geological formation of the region is of Quaternary age. The area is mostly covered by unconsolidated sediments which is known as Alluvial deposits followed by consolidated deposits of Satpura range. Few areas are also characterized by units of Archaean ages. The Satpura range mainly exposed in Gaya hills and Rajgir hills comprises low grade supracrustals – Schists, ferruginous phyllite, quartzites and phyllitic slate. The Archeans are the oldest rock formation in the area. The most predominant rock type is gneisses and granites with basic intrusive and pegmatoides. The area is dominated by medium to fine sand geologically the area comprising of Terrace alluvium deposited in depositional terraces of old rivers & contain cyclic sequence of fine to coarse grained sand. It is angular to sub angular and the angularity of the grains of this category of sand decreases with depth.

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Table No 3- 1: Showing the Geological Succession and their geographic distribution

Group	Formation	Lithology
Quaternary- Alluvium	Recent	Fine to Coarse sand, clay, silt
	Older	Fine to Coarse sand, gravel, Kankars, Clay
	UNCONFORMITY	
Pre- Cambrian	Chhotanagpur granite gneiss granite	Coarse grained,porphyritic, gray in color
	Granitic gneiss	Grayish black to black in colour

3.3.3 Basin/sub-basin, Drainage

The district falls under Punpun sub- basin of the Ganga basin. The drainage network in the district is represented by four parallel streams, the Morhar, the Falgu, the Paimar and the Dhadhar all emanating from the southern plateau and flowing north and northeasterly. The river Falgu flows from south to north through the area. It is formed by the union of two streams namely Lilajan and Mohana. Lilajan and Mohana are two large hilly streams originating in Hazaribagh Plateau. The width of the Phalgu at the junction of these two streams is about 274 m. These two united streams named as river Phalgu flows northwardly and pass by the town of Gaya where it its width is nearly 825 m. The streams, Lilajan and Mohana bring in high floodwater during the peak rainy season. Otherwise, they flow as tiny rivulets meandering through wide sandy beds.

(Source: Approved DSR, Gaya)

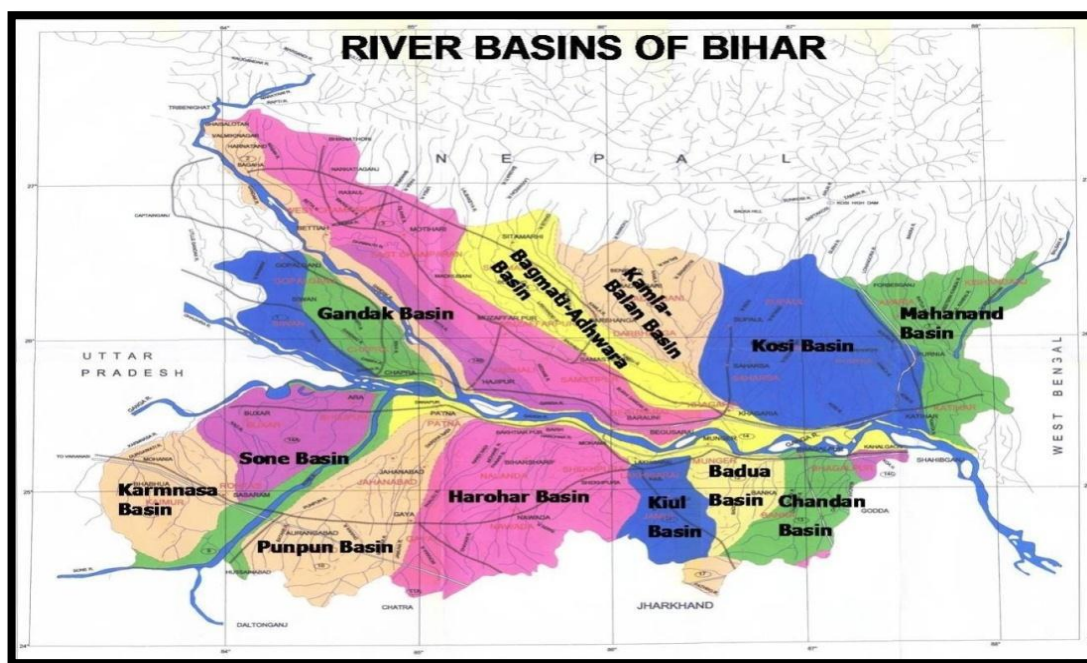


Figure 3- 1: River Basins of Bihar

3.3.4 Geomorphology

Geomorphologically, the district can be classified into four distinct geomorphic units namely a) rocky upland b) plateau and the pediplain c) high level marginal alluvial terrace (Dobhi-Gaya terrace) and d) Sone-Ganga plain. While the upland, plateau and the pediplain constitute the erosional landscape, the depositional landscape is portrayed by Dobhi-Gaya stretch of the terrace and the Sone-Ganga plain. Rocky upland: the southern hill tracts along the border of the district, the extension of the Rajgir hills on the northeast and the hills around Gaya constitute this unit. These hills are outcrops of Chotanagpur Plateau and stand as inliers. The Gaya town is surrounded by Ramshila hill (218 m height) on northern side, Katari hill (having 130 m height) towards west, and Brahma-yoni hill on the southern side (266 m height). Towards North-West of township at a distance of about 24 Km, there stands the Prêt-shila hill (266 m height).

Plateau and the Pediplain: the southern plateau represents the oldest table land having mature, dissected and rolling topography. The pediplain is covered by residual soil and slope and sheetwash deposits from bordering hills and inliers.

High level marginal alluvial terrace (Dobhi-Gaya terrace): this is the highest and oldest alluvial plain and always lies above the flood level of the present day river because it is the highest and

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the oldest alluvial plain, made up of the sediments brought from the erosion of the hills. The contact of the terrace and the pediplain is always transitional as the colluvial deposit often overlaps or interfinger with the alluvial sediments.

Sone-Ganga plain: this unit, primarily high level flood plain of the Ganga and the Sone rivers constitutes the intermediate alluvial plain between the terrace and the present day course of the two rivers. This presents flat, depositional topography consisting of unoxidised Quaternary alluvial deposit. This geomorphic unit, lying 80-100 m above msl lies to the north and northwest of Paraiya-Khizirsarai belt.

(Source: http://cgwb.gov.in/District_Profile/Bihar/Gaya.pdf).

3.3.5 Soil

Sandy soil, red and yellow soil and younger alluvial soil are the important soil types of the area. The Sandy soil, red and yellow soil are restricted to the southern and north eastern parts of the area occupied by the plateau, the pediplain and the high level marginal alluvial plain (terrace). These soils are locally called balwat, balmator, balsundri, which are extremely deficient in nitrogen and organic matter and hence infertile. Younger alluvial soil is restricted to the Sone Ganga plain. The soil consists chiefly of loam with a small proportion of sand and clay (kewal). The soils of this tract are rich in nitrogen and calcium and thus are fertile.

(Source: http://cgwb.gov.in/AQM/NAQUIM_REPORT/Bihar/Gaya%20Final.pdf)

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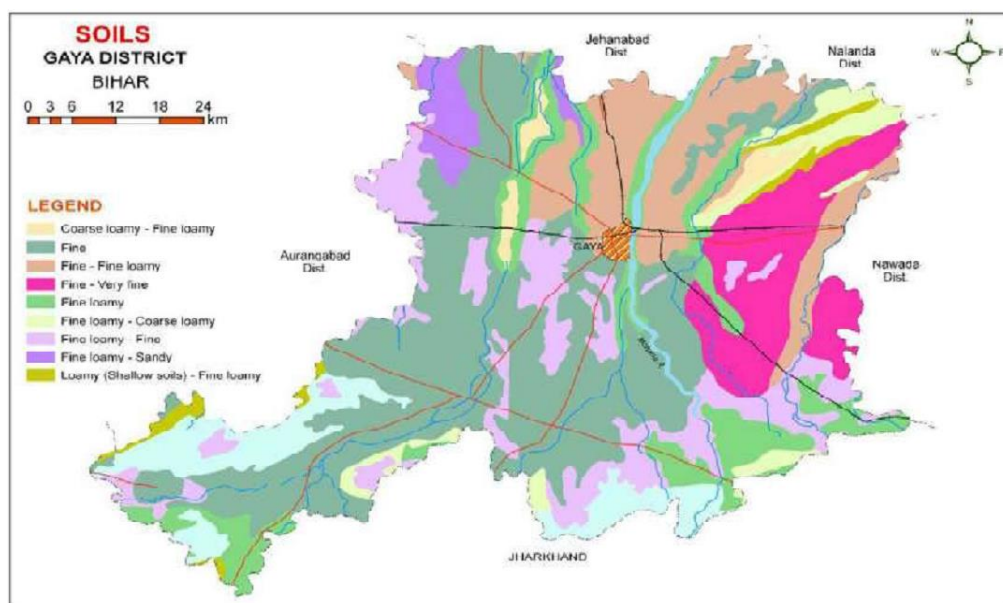


Figure 3- 2: Soil Map of Gaya District

[Source:http://cgwb.gov.in/AQM/NAQUIM_REPORT/Bihar/Gaya%20Final.pdf](http://cgwb.gov.in/AQM/NAQUIM_REPORT/Bihar/Gaya%20Final.pdf)

3.3.6 Drainage

The drainage network in the district is represented by four parallel streams, the Morhar, the Phalgu, the Paimar and the Dhadhar all emanating from the southern plateau and flowing north and northeasterly. The river Phalgu flows from south to north through the area. It is formed by the union of two streams namely Lilajan and Mohana. Lilajan and Mohana are two large hilly streams originating in Hazaribagh Plateau. The width of the Phalgu at the junction of these two streams is about 274 m. These two united streams named as river Phalgu flows northwardly and pass by the town of Gaya where it its width is nearly 825 m. The streams, Lilajan and Mohana bring in high floodwater during the peak rainy season. Otherwise they flow as tiny rivulets meandering through wide sandy beds.

(Source:http://cgwb.gov.in/District_Profile/Bihar/Gaya.pdf)

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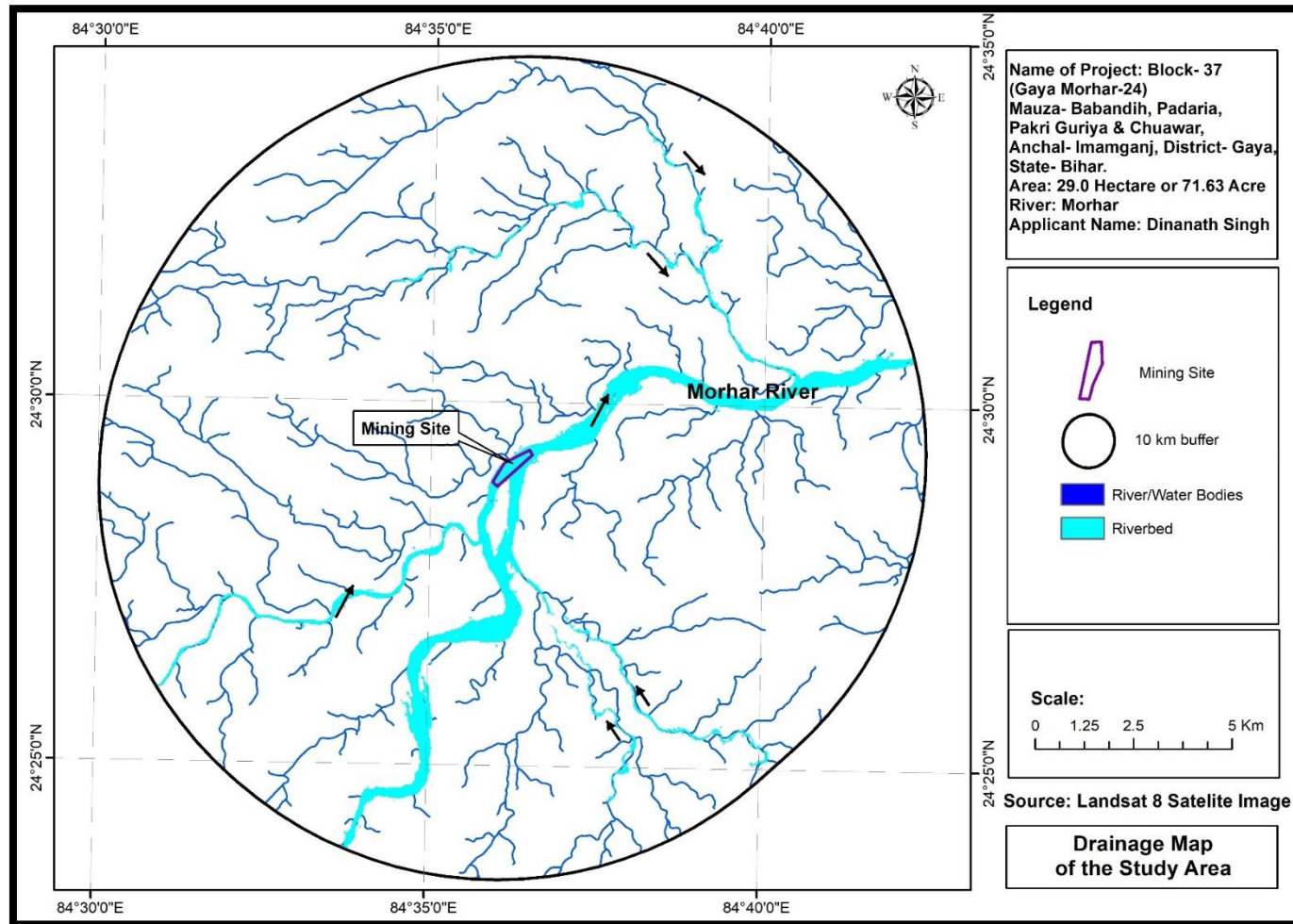


Figure 3- 3: Drainage map of Study area

3.3.7 Climate and Rainfall

The area experiences a continental monsoon type of climate owing to its great distance from the sea. The climate is extreme and comprises three broad seasons-the summer, the monsoon and the winter. The summer months from the middle of March to May are characterized by hot blasts of westerly winds commonly known as 'loo'. The peak of summer is in May when mercury shoots to 46°C. The cold spell starts from December and continues till end of February. During this period the mercury drops down to as low as 4°C.

The monsoon sets in the end of June. The months of July and August receive the maximum rainfall when average maximum rainfall of 338.4 and 231.3 mm is recorded. The annual normal rainfall of the district (1901-1970) is 1086 mm. As per available rainfall data, the district of Gaya

(Source: http://cgwb.gov.in/District_Profile/Bihar/Gaya.pdf)

Table No 3- 2: Rainfall of Gaya District (2017 to 2021)

YEAR	JAN		FEB		MAR		APR		MAY		JUN	
	R/F	%DE P	R/F	%DE P	R/F	%DE P	R/F	%DE P	R/F	%DE P	R/F	%DE P
2017	0.6	-96	0	-100	11.7	34	0	-100	15.5	-14	28.4	-78
2018	0	-100	3.2	-71	0	-100	1	-84	8.2	-55	121.5	-5
2019	11.6	-4	18.3	54	6.5	-13	3.8	-36	17.1	-14	62.7	-55
2020	3.9	-68	25.9	117	84.5	1026	0.2	-97	33.8	70	225	60
2021	1.4	-88	0.4	-97	0.5	-93	0.5	-92	224.9	1030	333.8	137
YEAR	JUL		AUG		SEPT		OCT		NOV		DEC	
	R/F	%DE P	R/F	%DE P	R/F	%DE P	R/F	%DE P	R/F	%DE P	R/F	%DE P
2017												
2018	324.1	9	281.6	4	101.2	-44	5	-91	0.3	-97	0	-100
2019	285.5	-4	251.3	-8	102.3	-43	15.3	-72	0	-100	6	6
2020	201.7	-30	224.2	-10	360.4	101	26.1	-48	0	-100	18.6	210
2021	226.9	-22	180.6	-27	144.2	-20	41	-18	1.6	-80	0	-100
	249.6	-14	328.8	32	163.6	-9	100.9	101	0	-100	26.9	348

(Source: [https://hydro.imd.gov.in/hydrometweb/\(S\(kf5szrme2pq5i1uwk1fkpa55\)\)/DistrictRaifall.aspx](https://hydro.imd.gov.in/hydrometweb/(S(kf5szrme2pq5i1uwk1fkpa55))/DistrictRaifall.aspx))

3.4 Hydrogeology

The occurrence and movement of ground water in the area is variable, which depends on geomorphology, structure, geological setting, hydraulic properties, tectonic setup etc. The hydrogeological condition of Gaya is complex due to diverse geological terrain vide variability of topography, drainage etc. Based on morphogenetic and geological diversities and relative ground water potentialities in the aquifer belonging to different geological formation, the study area can be broadly sub-divided into two hydrogeological units.

(A) Fissured formations, and

(B) Porous formations

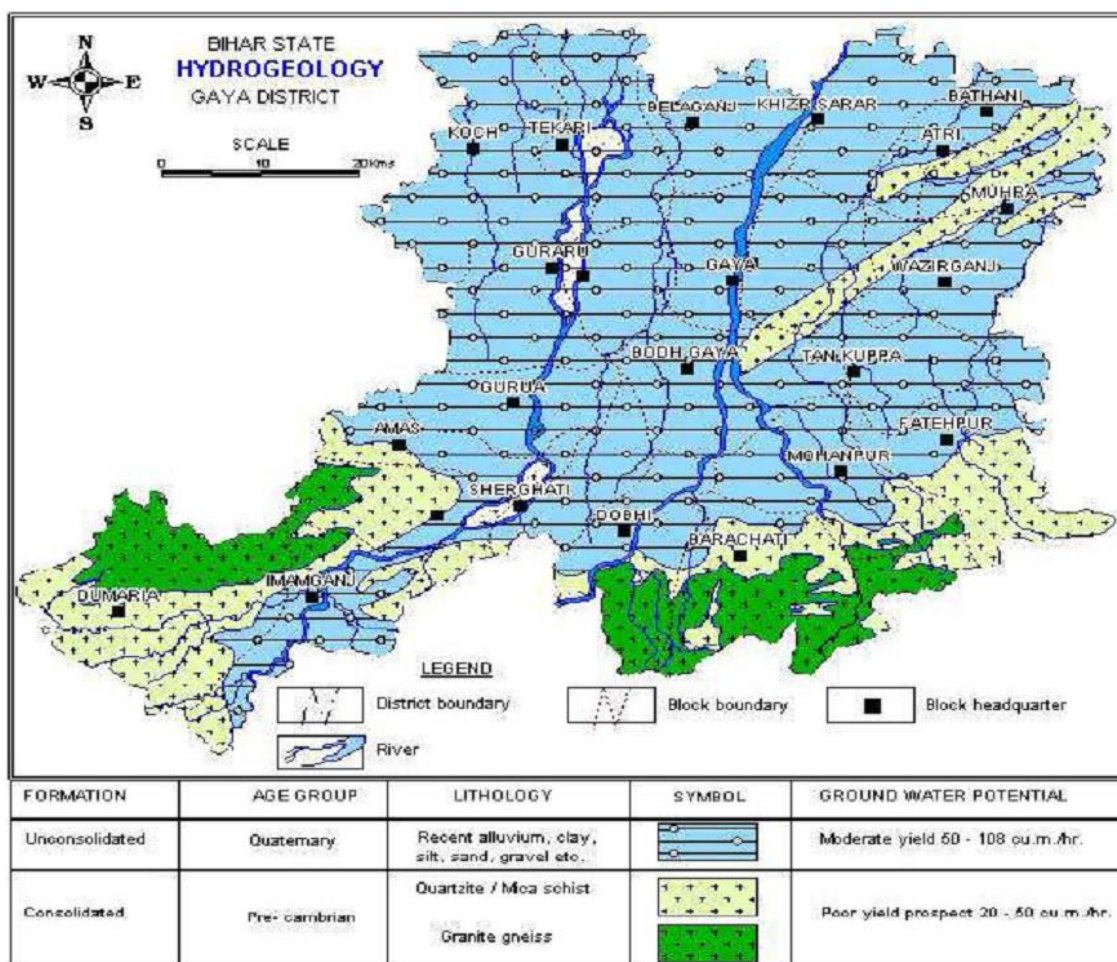


Figure 3- 4: Hydrogeology map of Gaya district

((Source: http://cgwb.gov.in/District_Profile/Bihar/Gaya.pdf))

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Pre and post monsoon depth to water level varies from 5.14 – 8.54 m bgl and 1.67 – 8.84 m bgl respectively. From the study of the pre-monsoon (2019) depth to water level map (Figure 2-8), it is evident that ground water level during pre-monsoon period mainly varies between 5-10 m below ground level in the major part of the district. Deeper ground water levels (>10m) were observed in isolated patch in the southern part of the district. From the study of the post-monsoon (2019) depth to water map (Figure 2-9), it is conspicuous that ground water level during post-monsoon period mainly varies between 2-5 m below ground level in the major part of the district. Deeper ground water levels (5-10) were observed over a north & north-west part of the district.

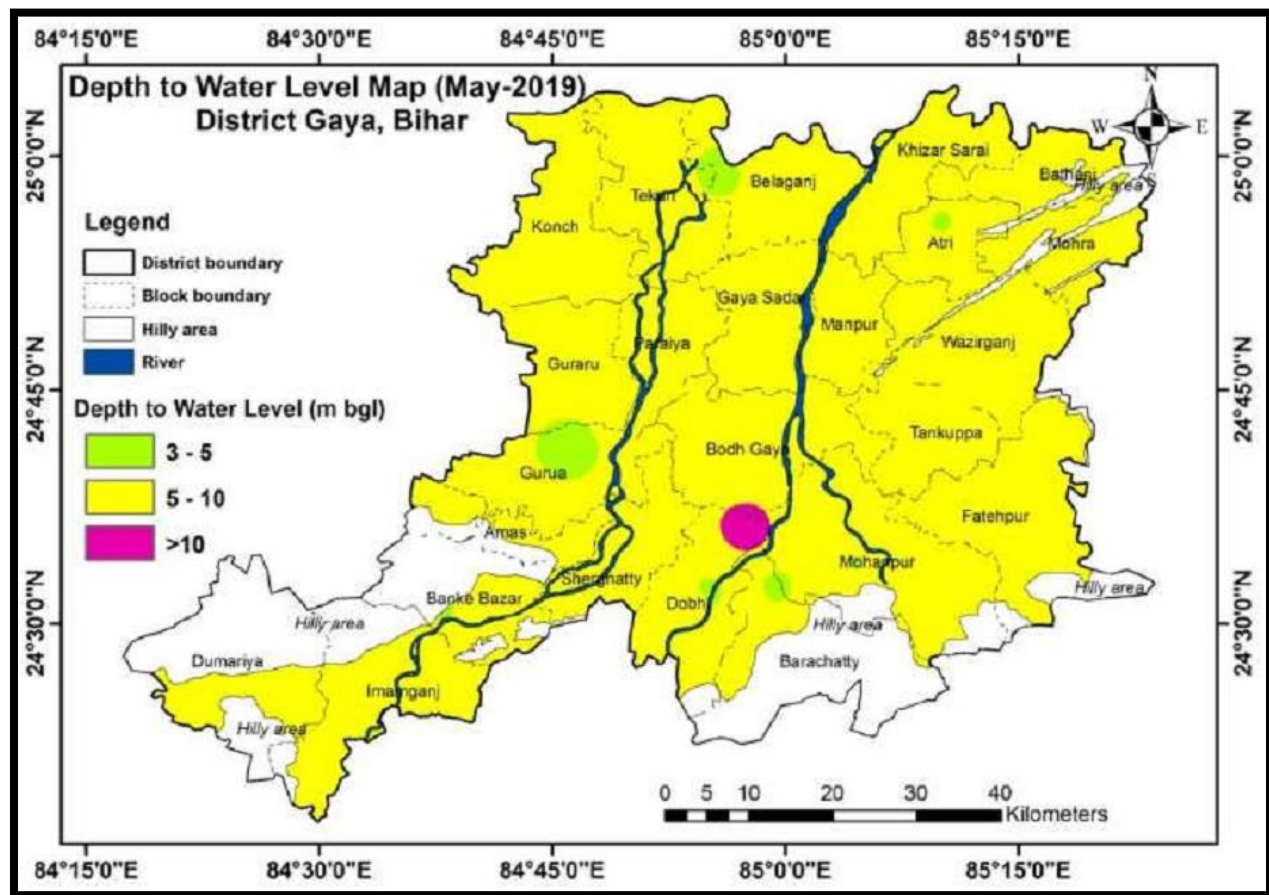


Figure 3- 5: Pre-Monsoon Depth to Water Level Map (2019) of Gaya District
(Source: http://cgwb.gov.in/District_Profile/Bihar/Lakhisarai.pdf)

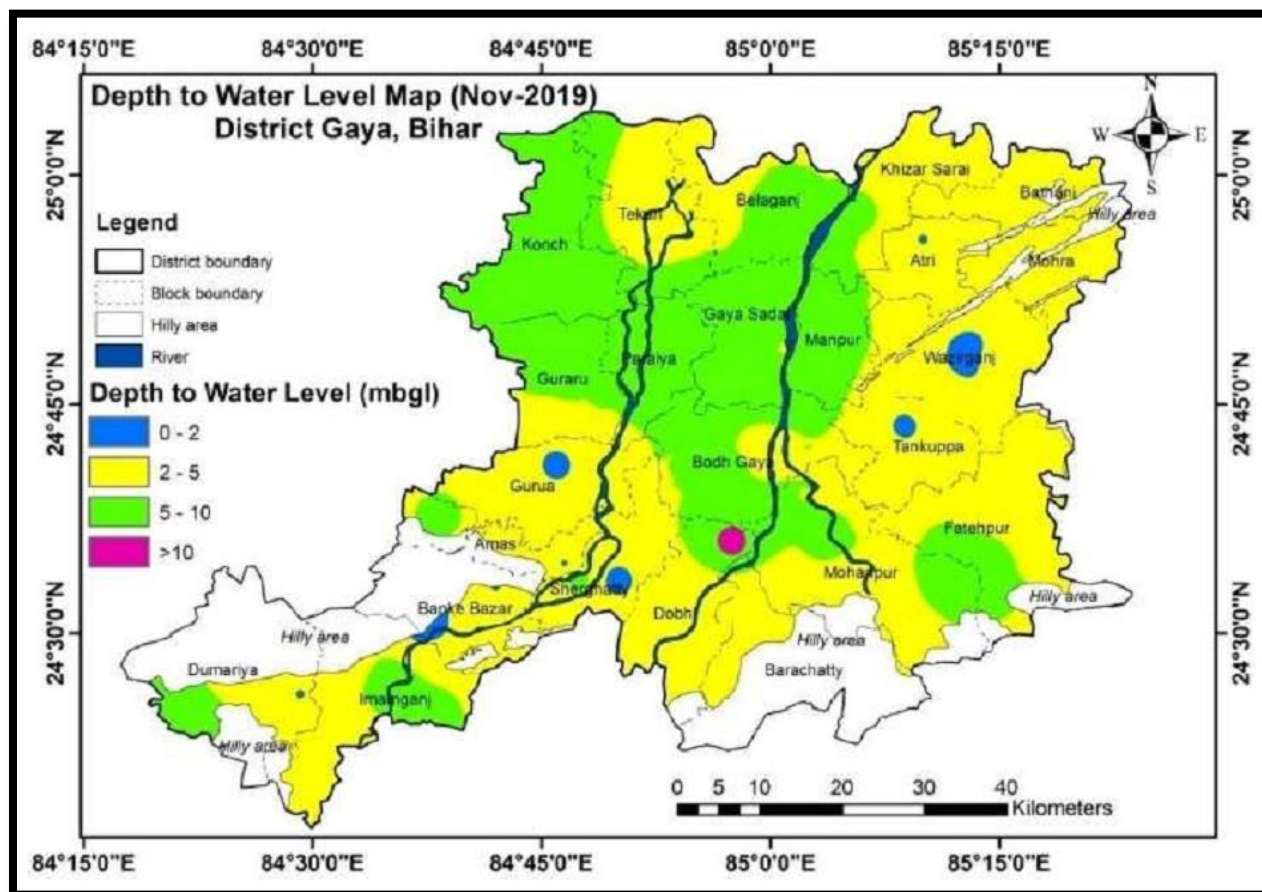


Figure 3- 6: Post-Monsoon Depth to Water Level Map (2019) of Gaya District

(Source: http://cgwb.gov.in/District_Profile/Bihar/gaya.pdf)

3.5 Seismicity of the Area

The state of Bihar lies in a region with moderate to low to high seismic hazard. As per the 2002 Bureau of Indian Standards (BIS) map, this state also falls in Zones III, IV and V. Historically, this region has experienced earthquake in the M5.0-7.0 range. The mine lease area is located in seismic **Zone III**. This region is liable to **MSK VII** and is classified as the **moderate Damage Risk Zone**.

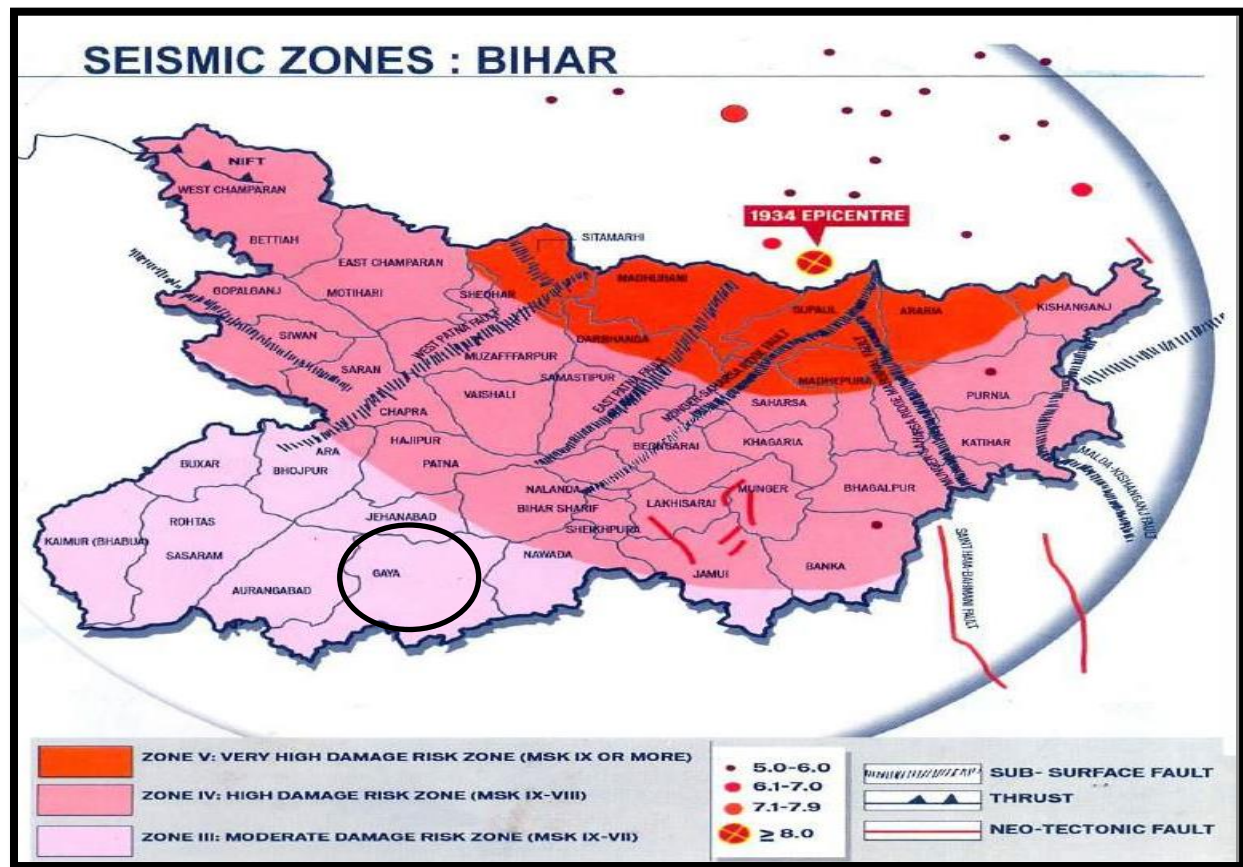


Figure 3- 7: Earthquake Hazard Map of Bihar

3.6 Land Environment

Landcover data highlights the area covered by forests, wetlands, impervious surfaces, agriculture, and other land and water types. Water types include wetlands or open water. Landuse shows how people use the landscape for development, conservation or for other purposes. Therefore its highlights the current scenario as well as predict the impact.

1. Objectives : Main objectives are:

- To prepare the landuse landcover map of study area based on recent satellite imageries.
- To assess the impact of proposed project on existing landuse and landcover
- To suggest mitigations measures

2. Hardware: The equipment used during the present investigation includes ground truth hand held GARMIN 12 GPS receiver for ground truth collection, besides the visual observation and analysis.

3. Software: The following software were applied to extract indicators and maps:

- **ERDAS Imagine:** The Erdas imagine version 2016 is used to process Landsat-8 satellite data and to extract the required indicators through spatial & spectral analysis.
- **ArcGIS:** The ArcGIS version 10.3 has been used to prepare the final Maps for indicators through the outcomes of ERDAS software.

4. Methodology: The methodology applied for the study involved obtaining satellite images from open source, and then using a range of software to process the images and also by GPS coordinates (ground truthing) for drawing observations. The detailed methodology is explained as below:

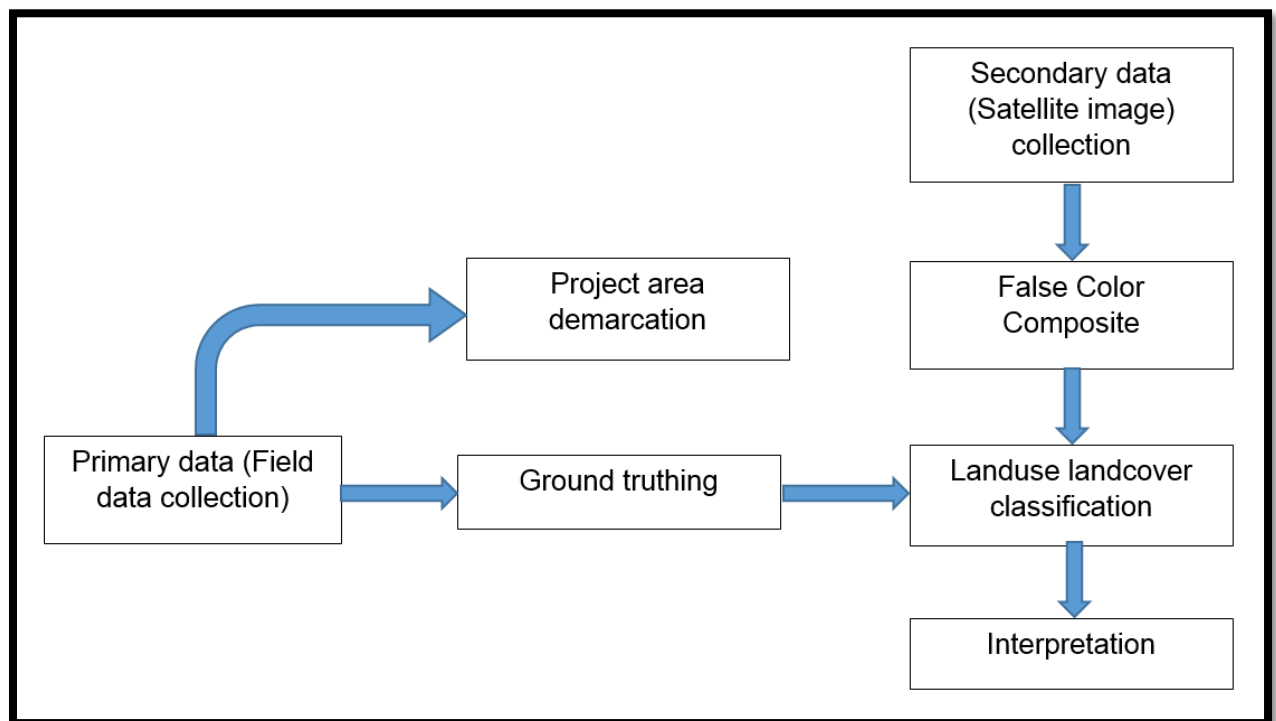


Figure 3- 8: Flow Chart: Methodology

- **Primary Data:** The coordinates along land features of project area is collected with the help of GPS device for ground truthing. This data is primary data. On the basis of this data, landuse landcover analysis is appropriate.
- **Secondary Data:** Satellite image (secondary data) is required to show the current land features of the project area and buffered area (10 km). **Landsat 8** Satellite image is used, which is collected from open source.

The path, row, date, resolution of satellite data used were as follows.

Path	141
Row	43
Date of pass	24 March 2023
Resolution (panchromatic)	15 Meter

Landsat 8 Operational Land Imager (OLI) and Thermal Infrared Sensor (TIRS) images consist of nine spectral bands with a spatial resolution of 30 meters for Bands 1 to 7 and 9. The ultra-blue Band 1 is useful for coastal and aerosol studies. Band 9 is useful for cirrus cloud detection.

- **False Color Composite (FCC):** False color (or false colour) refers to a group of color rendering methods used to display images in color which were recorded in the visible or non-visible parts of the electromagnetic spectrum. A false-color image is an image that depicts an object in colors that differ from those a photograph (a true-color image) would show. False-color image sacrifices natural color rendition in order to ease the detection of features. The FCC for 10 km buffer zone of the project area is shown in Figure 3-10.

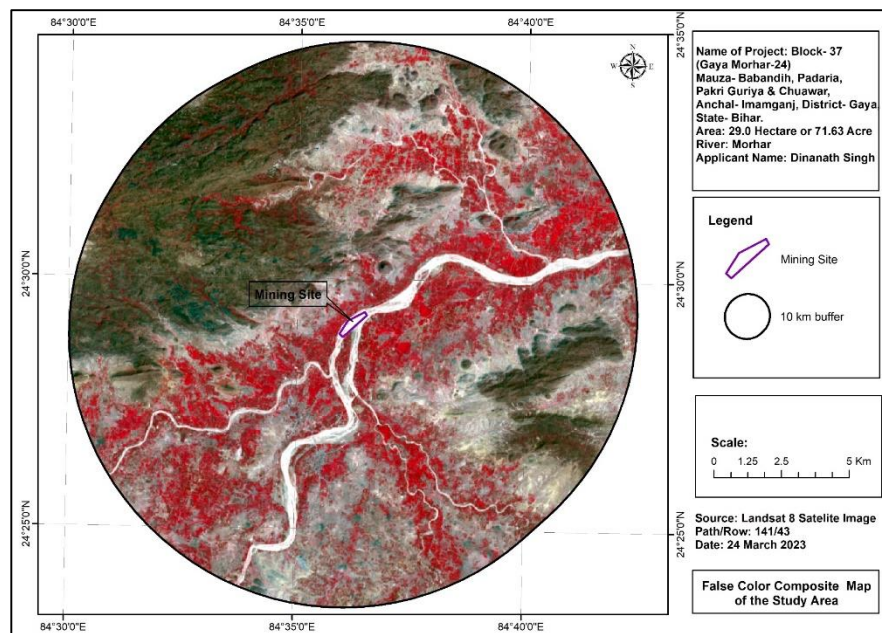


Figure 3- 9: Shows False Color Composite Map

- **Landuse landcover classification & Interpretation:** The classification approach is applied on the basis of various characteristics like colour, texture, shape, association etc. The Landuse landcover map for 10 km buffer zone of the project area is shown in figure 3.

The unsupervised classification approach was obtained for the Landuse and Landcover classification by using ERDAS Imagine software. In this approach, the pixels of the project area are clustered in several classes on the basis of spatial & spectral variation in pixel value which are following:

- I. Built-up land:** 1.23 per cent of the total project area is covered by built-up land. The entire built-up land comes under rural areas. This area is identified by grey color and square/rectangular shape in the satellite image. Built-up land can be described as an area of intensive use with much of the land covered by structures. Areas included in this category are cities, towns, villages, strip developments along with highways, transportation, power, and communications facilities, and other areas such as those occupied by mills, shopping centers, industrial and commercial complexes, and institutions that may, in some instances, be isolated from built-up areas.
- II. Agricultural land:** 32.82 per cent of the total project area is covered under agricultural land. Agricultural land may be defined as the land that is used primarily for the production of food and fiber. In the satellite imageries, cropland is identified by light pinkish to dark pinkish color or red, fine texture and rectangular/square shape.
- III. Agricultural fallow land:** It is the type of cropland which is not seeded for a season so as to allow the fields become fertile again. The practice of allowing fields to remain fallow dates back to ancient times when farmers realized that using soil over and over again depletes its of its nutrients. Agricultural fallow land covers 18.76 per cent of the total project area.
- IV. Open Land:** Open land is any degraded land or a land which is currently underutilized but can be brought under vegetative cover with reasonable efforts. This

type of land covers 7.56 per cent of the total project area. This area is identified by off-white color and rough texture in the satellite image.

V. Riverbed: A riverbed or streambed is the channel bottom of a stream or river, the physical confine of the normal water flow. The riverbed of the project area is consist of sand and cover only 3.60 percent of the total project area. This area is identified by white color and fine texture in the satellite image.

VI. Forest: This type of land features covers only 36.02 percent of the total project area.

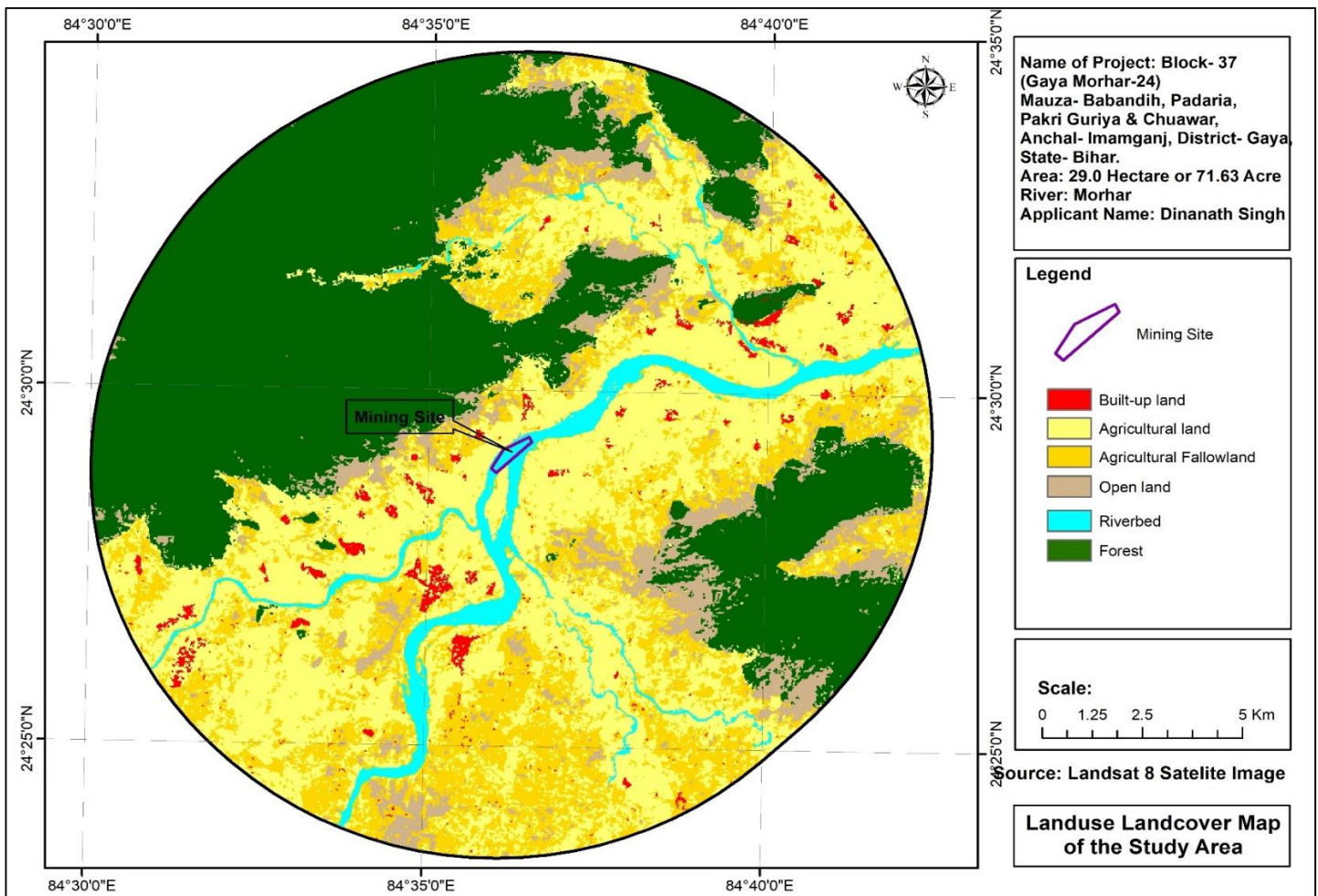


Figure 3- 10: Landuse Landcover Map

On the basis of the landuse landcover classification, the areas of different land features are as follows:

Table No 3- 3: Landuse and Landcover

Class Name	Area (%)	Area (Ha)
Built-up land	421.90	1.23
Agricultural land	11243.30	32.82
Agricultural Fallowland	6427.26	18.76
Open land	2590.13	7.56
Riverbed	1233.74	3.60
Forest	12338.10	36.02
Total area	34254.43	100.00

In this connection, pie chart of the land use landcover is shown in Figure 3-11 which is prepared on the basis of the above table.

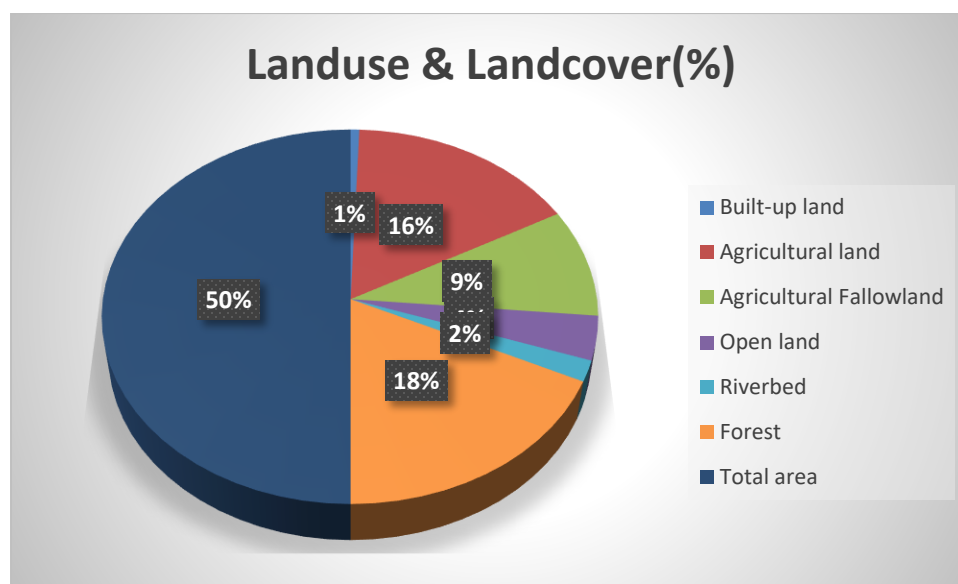


Figure 3- 11: Pie-chart of Landuse Landcover area

Impact Analysis:

Indiscriminate river sand mining directly influences the shape of the riverbed. This often results in many indirect and cumulative effects on the physical characteristics and the dynamic equilibrium of erosion and sedimentation of a river. Excessive sand mining can alter the river bed, force the river to change course, erode banks and lead to flooding

Mitigation measurement:

Mitigation measures are means to prevent, reduce or control adverse environmental effects of a project, and include restitution for any damage to the environment caused by those effects through replacement, restoration, compensation or any other means. The mitigation measures are as follows:

1. Excessive sand mining should not be done.

Ensure conservation of the river equilibrium and its natural environment by protection and restoration of the ecological system. Ensure the rivers are protected from bank and bed erosion beyond its stable profile.

3.7 Soil Sampling

Soil, defined as a thin layer of earth's crust, is the medium for the growth of plants, comprises of both physical and chemical properties significant to the project. The baseline study covers collection of soil samples and determining relevant physical and chemical properties. soils have been formed as a narrow belt along the western periphery of the district following the Morhar River. These are generally yellowish white to reddish yellow in colour, sandy to loamy sand in texture. Major parts of the district are occupied by the Older Alluvial soils. These soils are composed of very fine to fine sand and clay. These are grey to grayish yellow in colour and moderate to heavy in texture.

3.7.1 Methodology

Soil sample collection was done making a pit about 15 inches deep and heaping the loose soil dug out. The loose soil is spread up in a circle and divided into 4 quadrants. The opposite quadrants are chosen and again the process is repeated till we get the required quantum of sample for analysis purpose. Collection of samples was done from 4 locations as shown in Table 3.4& Figure 3.12. Samples were analyzed as per CPCB guidelines.

The physio-chemical characteristics of these soil samples are given in Table No. 3.5.

3.7.2 Selection of stations for Sampling

To understand the soil characteristics, 05 locations in the study area were selected for soil sampling. For selection of soil sampling locations, the following criterion was considered:

- Soil from agricultural land, park open land.

3.7.3 Analysis of Soil Samples

The soil samples were examined for various physicochemical parameters, to determine the existing soil characteristics of the study area.

Table No 3- 4: Soil Quality monitoring locations

S.No	Name	Distance & Direction from project site	Co-ordinates
SQ1	Near Project Site	0.27 Km, WNW	24°29'17.59"N 84°36'3.38"E
SQ2	Bishunbigha	0.50 Km, WNW	24°29'15.72"N 84°35'46.12"E
SQ3	Chaubar	1.0 Km, ENE	24°28'56.33"N 84°36'53.90"E
SQ4	Raunsa	1.4 Km, SE	24°28'26.15"N 84°36'31.05"E
SQ5	Kochia	2.5 Km, ESE	24°28'15.39"N 84°37'19.93"E

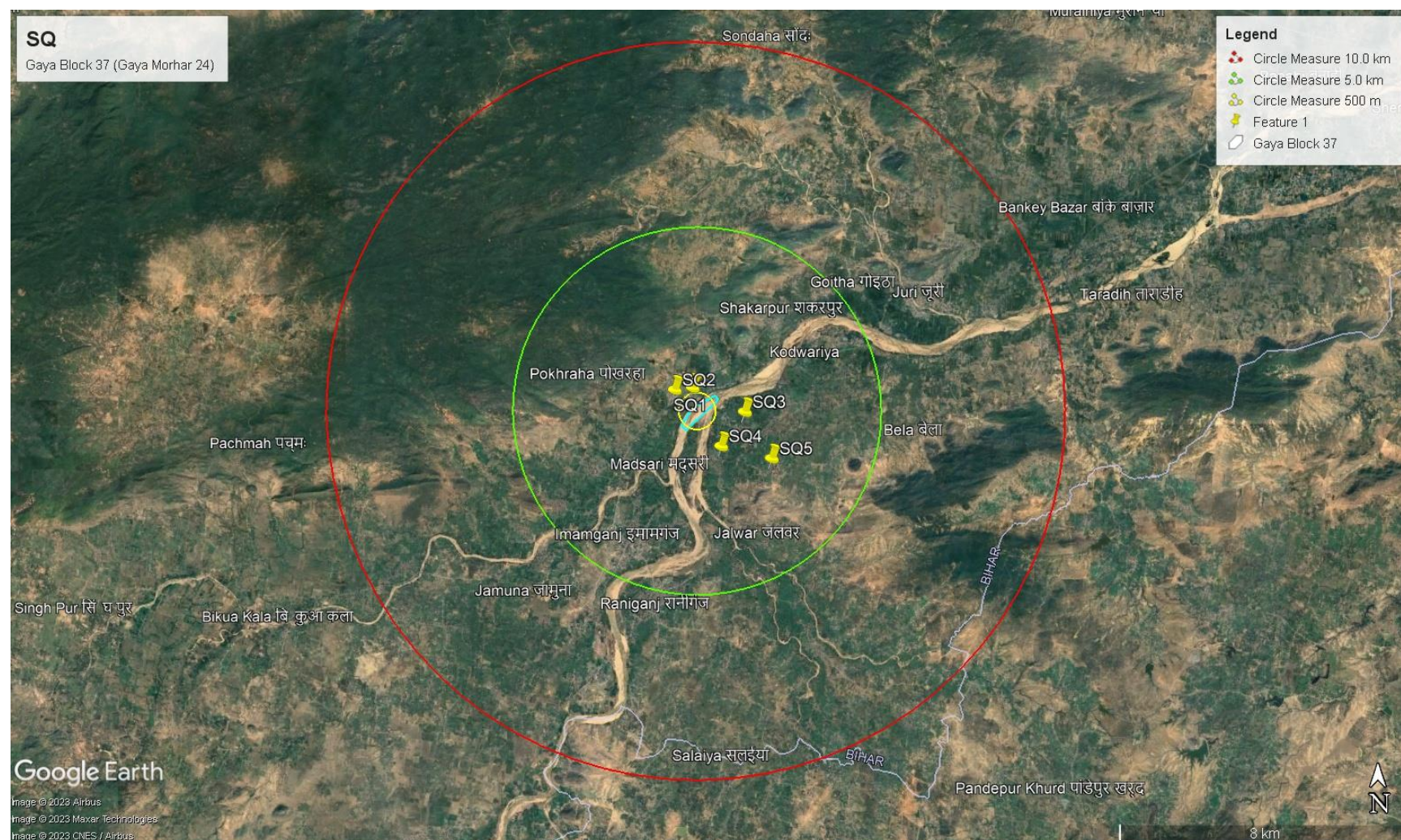


Figure 3- 12: Map showing Soil Quality Monitoring Locations

Analysis results of physical and chemical parameters of soil samples are given in Table no. 3-4. Chemical classification of soil quality as per Indian Council Agriculture Research (ICAR) is given in Table 3-5.

The details of soil sampling locations & result are given in Table No. 3-4 & 3-5. The soil sampling locations are shown in Figure No. 3-12.

Table No 3- 5: Chemical Classification of Soil Quality

Sr. No.	Soil Analysis Parameters	Classification
1	pH	4.5 Extremely acidic 4.51- 5.50 Very strongly acidic 5.51-6.00 moderately acidic 6.01-6.50 slightly acidic 6.51-7.30 Neutral 7.31-7.80 slightly alkaline 7.81-8.50 moderately alkaline 8.51-9.0 strongly alkaline 9.01 very strongly alkaline
2	Salinity Electrical Conductivity (mmhos/cm) (1ppm = 640 mmho/cm)	Up to 1.00 Average 1.01-2.00 harmful to germination 2.01-3.00 harmful to crops (Sensitive to salts)
3	Organic Carbon (%)	Up to 0.2: very less 0.21-0.4: less 0.41-0.5 medium, 0.51-0.8: on an average sufficient 0.81-1.00: sufficient >1.0 more than sufficient
4	Nitrogen (Kg/ha)	Up to 50 very less 51-100 less 101-150 good 151-300 Better >300 sufficient
5	Phosphorus (Kg/ha)	Up to 15 very less 16-30 less 31-50 medium 51-65 on an average sufficient 66-80 sufficient >80 more than sufficient
6	Potash (Kg/ha)	0 -120 very less 120-180 less 181-240 medium 241-300 average 301-360 better >360 more than sufficient

Table No 3- 6: Soil Quality Parameters

S. No.	Test Parameters	Unit	SQ 1	SQ 2	SQ 3	SQ 4	SQ 5
1	Moisture	%	14.6	15.5	12.1	10.8	15.3
2	Texture	...	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam
3	Sand	%	53.4	50.6	60.4	60.1	56.7
4	Silt	%	28.5	38.1	27.5	21.1	27.2
5	Clay	%	18.1	11.3	12.1	18.8	16.1
6	pH (1:2 Suspension)	..	7.80	7.14	7.00	7.26	7.37
7	Cation Exchange Capacity(CEC)	meq/100g	28.0	29.5	28.9	27.5	28.1
8	Sodium Absorption Ratio (SAR)*	%	1.97	1.04	1.65	1.79	1.30
9	Electrical Conductivity (1:2)	µmho/cm	330.2	346.9	340.1	323.7	361.3
10	Water Holding Capacity(WHC)	%	30.6	32.1	31.5	30.0	37.0
11	Sodium (Na)	mg/kg	112.9	118.6	116.3	110.7	117.1
12	Calcium (Ca)	mg/kg	1193.8	1115.9	953.7	951.2	1146.6
13	Magnesium (Mg)	mg/kg	418.3	439.2	430.6	410.1	410.1
14	Bulk Density	g/cm ³	1.47	1.55	1.52	1.45	1.37
15	Total Nitrogen (N)	mg/kg	157.2	179.2	175.7	154.1	175.3
16	Phosphorus (PO ₄)	mg/kg	49.5	37.4	36.7	48.5	56.7
17	Potassium (K)	mg/kg	263.8	189.5	185.8	258.7	281.4
18	Organic Matter	%	2.00	2.10	2.04	1.94	1.90
19	Organic Carbon	%	1.53	1.61	1.57	1.50	1.38

20	Sulphate as (SO ₄)	mg/kg	1.72	1.80	1.77	2.6	2.52
21	Porosity	%	17.7	15.2	14.9	17.3	19.2
22	Manganese,(Mn)	mg/kg	3.35	3.51	3.44	3.28	3.28
23	Nickel,(Ni)	mg/kg	1.63	1.70	1.67	1.59	1.59
24	Zinc,(Zn)	mg/kg	1.14	1.20	1.18	1.13	2.81
25	Lead,(Pb)	mg/kg	2.00	2.10	2.07	1.96	1.01

3.7.4 Interpretation of Soil Quality Results

3.7.4.1 Analysis of result of soil data

a) Physical characters

The physical characters include Bulk density, grain size distribution (textural analysis), Porosity, Infiltration, Water holding capacity.

Grain size distribution: Texture indicates relative proportion of various sizes of primary soil particles such as sand, silt and clay present in the soil. Based on their quantities present in the soil sample and using the textural classification diagram. The textural classes of five soil samples are sandy clay loam, i.e coarse to fine texture. Bulk density values confirm the textural class.

Bulk Density: In case of bulk density total soil space (space occupied by solid and pore spaces combined) are taken in to consideration. Thus, Bulk Density is defined as the mass (weight) of a unit volume of a dry soil. This volume would, off course includes both solids and pores. Soil texture, soil structure and organic matter content are the factors influencing the bulk density of a soil. Bulk Density, besides being an interesting and significant physical characteristic, is very important as a basis for certain computations. The Bulk density of the five-soil sample under consideration ranges between 1.37 to 1.55 g/cm³, and confirms the texture of the soil samples of the area under study.

Water Holding Capacity (WHC): Water holding capacity of soil is the maximum amount of moisture, a dry soil is capable of holding, under given standard condition. If the moisture content is increased further percolation result WHC is of great value to practical agriculture, since it provides a simple means to determine moisture content. WHC required for good crop growth is 35 to 70%. The WHC of the five soil samples ranges between 30.0 to 37.0% indicating somewhat frequent water application for growing crops.

b) Chemical Characters

The parameters considered for chemical analysis are: Soil reaction (pH), Electrical conductivity (EC), Cation Exchange Capacity (CEC), Sodium Adsorption Ratio, (SAR), ESP, Macro nutrients like Available Nitrogen, Total Organic carbon, organic matter,

available phosphorus, available potassium Micro nutrients like Zinc, manganese, copper. Heavy metals like Lead (Pb), Nickel (Ni), Cadmium (Cd), Chromium (Cr), arsenic (As) and PAH.

Soil reaction (pH): The nutritional importance of pH is illustrated, thus hydrogen ion concentration has influence not only on, solubility of nutrients, but also upon facility with which these nutrients are absorbed by plants, even already in soil solution for e.g. Fe, Mn and Zn become less available as pH rises from 4.5 to 7 to 8. At pH 6.5 to 7.0 utilization of nitrate and ammonia nitrogen becomes more available. In case of phosphorus, it becomes less available to plant as pH increases above 8.5, due to its fixation in exchange complex of soil. For the five-soil sample under consideration the pH range between **7.0 to 7.8** indicating soils are slightly alkaline and are almost normal for crop growth.

Electrical conductivity (EC): The salt content of the soils is estimated by EC measurements, and is useful to designate soils as normal or sodic (saline). Electrical conductivity is expressed as $\mu\text{mhos/cm}$ at 25°C , $\mu\text{mhos/cm}$, mmhos/cm or $\mu\text{s/cm}$. The EC of five soil samples is between **323.7 to 361.3** $\mu\text{mhos/cm}$ and are below the limits to be called as saline and hence the soils are normal for crop growth.

Organic Carbon / Organic matter (%): Although accounting for only a small part of the total soil mass in mineral soils, organic matter influences physical, chemical, and biological activities in the soil. Organic matter in the soil is plant and animal residue which serves as a reserve for many essential nutrients, especially nitrogen. Determination of organic matter helps to estimate the nitrogen which will be released by bacterial activity for the next season depending on the conditions, soil aeration, pH, type of organic material, and other factors. The five soil samples under consideration contain 1.38% to 1.61% organic carbon calculated from organic carbon estimation. As per crop requirements different soils samples are on an more than sufficient in organic matter content.

Available Nitrogen (N): Nitrogen is a part of all living cells and is a necessary part of all proteins, enzymes and metabolic processes involved in the synthesis and transfer of energy. Nitrogen is a part of chlorophyll, the green pigment of the plant that is responsible for photosynthesis. Helps plants with rapid growth, increasing seed and fruit production and improving the quality of leaf and forage crops. The available nitrogen in the five samples in question, as per analysis, ranges between 154.1 to 179.2 mg/kg showing better available nitrogen content in different samples, for crop growth.

Available Phosphorus (P): Like nitrogen, phosphorus (P) is an essential part of the process of photosynthesis involved in the formation of all oils, sugars, starches, etc. Helps with the transformation of solar energy into chemical energy; proper plant maturation; withstanding stress. Effects rapid growth, Encourages blooming and root growth. The phosphorus content of soil of five samples ranges between 36.7 to 56.7 mg/kg and falls under average sufficient category for crop growth.

Available Potassium (K): Potassium is absorbed by plants in larger amounts than any other mineral element except nitrogen and in some cases, calcium helps in the building of protein, photosynthesis, fruit quality and reduction of diseases. The Potassium content of five soil samples ranges between 185.8 to 281.4 mg/kg and is average for crop growth.

Comments: The interpretation of field data, physical and chemical data it can be concluded that:

As per the physical data soils are coarse to fine texture, imperatively moderate water holding capacity, and moderate to slow permeability. As per physical characters' soils are rated as moderately good for agriculture.

As per chemical characters' soil reaction (pH) soils are slightly alkaline and normal for crop growth. Organic carbon is on more than sufficient. Macro nutrient like nitrogen is better, phosphorus is average sufficient and potassium is average. Base saturation is slightly.

3.8 Water Environment

3.8.1 General

This section describes the prevailing water environment in the study area in terms of water resources i.e., quantitatively and qualitatively. This has been achieved by performing qualitative analysis of water samples collected from ground water source and surface water body falling within the study area. Ground & Surface water samples are collected from locations as shown in Fig. 3.13 and Fig. 3.14 respectively. Primary objective of the study is to assess the water quality for critical parameters and evaluate its impact on habitat and aesthetics in the surrounding areas of the project. This assessment will be useful in formulating mitigation measures to minimize the impacts of the project on the surrounding environment.

3.8.2 Methodology

Contour and Drainage pattern are the most important factors governing the choice of sampling locations. It can be assumed that run-off from project site, if any will follow the natural drainage and contour of the landscape. Therefore, downstream areas are mostly likely to experience the impacts of the project. On this basis, four surface water and five ground water sampling locations were chosen for determining quality of water for the category of end use and for parameters as per IS:10500 -2012. Thus, it helps in predicting the entry of potential pollutant or merging tributaries acts as a source of pollution in the river which affects the quality of water. It helps in determining the extent of pollution.

Based on the above factors, sampling locations for Ground and surface water quality have been finalized and shown in Table 3.7 Figure 3.13 & Table 3.10, Figure 3.14, respectively. AIS 10500:2012 (for drinking water) has been used for analysis of the water samples for drinking purpose and for the designated use of water as per the categories of CPCB guidelines.

3.8.3 Groundwater

3.8.3.1 Ground water Potential

The Study area falls under Western part of the district. As per CGWB report, water level varies in these areas between 2- 5 mgl. Most of villages in the project area have borewell and tube well facilities, as most of the residents of these villages make use of this water for agriculture and domestic purposes. Therefore, Ground water sampling was done from villages within 10 km radius of the project site. Ground water sampling locations are given in Table 3.7. All Ground water samples are analyzed as per IS-10500:2012. The results of the analyzed ground water samples result are given in Table 3.7& Figure 3.13 shows Ground water sampling location on Topographic map.

Table No 3- 7: Ground water monitoring locations

S.No	Name	Distance & Direction from project site	Co-ordinates
GW1	Near Project Site	0.28 Km, WNW	24°29'19.11"N 84°36'4.30"E
GW2	Bishunbigha	0.50 Km, WNW	24°29'14.60"N 84°35'46.79"E
GW3	Chaubar	1.0 Km, ENE	24°28'54.66"N 84°36'52.35"E
GW4	Raunsa	1.3 Km, SE	24°28'24.73"N 84°36'30.64"E
GW5	Kochia	2.45 Km, ESE	24°28'16.50"N 84°37'22.33"E

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Figure 3- 13: Map showing Ground Water Monitoring Location

Table No 3- 8: Ground water quality results

S. No.	Test Parameters	Unit	GW-1	GW-2	GW-3	GW-4	GW-5	Drinking Water Standards / Limit (IS:10500 2012)		Test Method
								Desirable	Permissible	
1	Colour	Hazen	<5.0	<5.0	<5.0	<5.0	<5.0	5	15	IS:3025 (Pt-4)
2	Odour	---	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (Pt-5)
3	pH	---	7.22	7.41	7.27	7.15	7.29	6.5 - 8.5	No Relaxation	IS:3025 (Pt-11)
4	Taste	---	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (Pt-8)
5	Turbidity	NTU	<1.0	<1.0	<1.0	<1.0	<1.0	1	5	IS:3025 (Pt-10)
6	Total Dissolve Solid (TDS)	mg/L	514.5	468.2	442.4	370.3	385.7	500	2000	IS:3025 (Pt-16)
7	Total Alkalinity (CaCO ₃)	mg/L	170.3	156.2	139.5	109.7	111.9	200	600	IS:3025 (Pt-23)
8	Total Hardness(CaCO ₃)	mg/L	255.1	206.3	183.8	155.4	178.4	200	600	IS:3025 (Pt-21)
9	Chloride (Cl)	mg/L	104.4	114.8	82.2	89.3	91.07	250	1000	IS:3025 (Pt-32)
10	Calcium (Ca)	mg/L	69.3	77.9	59.8	57.0	58.10	75	200	IS:3025 (Pt-40)
11	Mineral Oil	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	0.5	No Relaxation	IS:3025 (Pt-39)
12	Sulphate (SO ₄)	mg/L	39.47	49.07	33.78	32.78	33.44	200	400	IS:3025 (Pt-24)
13	Nitrate (NO ₃)	mg/L	0.87	1.13	0.71	0.74	0.75	45	No Relaxation	IS:3025 (Pt-34)
14	Fluoride (F)	mg/L	0.29	0.27	0.23	0.23	0.24	1	1.5	IS:3025 (Pt-60)
15	Iron (Fe)	mg/L	0.26	0.21	0.16	0.10	0.10	0.3	No Relaxation	IS:3025 (Pt-53)
16	Aluminium (Al)	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	0.2	APHA-3500 (B)

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17	Selenium (Se)	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	No. Relaxation	APHA-3113 (B)
18	Cyanide (Cn)	mg/L	N.D	N.D	N.D	N.D	N.D	0.05	No. Relaxation	APHA-4500 (C)
19	Copper(Cu)	mg/L	0.06	0.03	0.08	0.08	0.08	0.05	1.5	APHA-3111(B)
20	Magnesium (Mg)	mg/L	12.25	7.17	9.02	8.73	8.9	30	100	IS:3025 (Pt-45)
21	Manganese(Mn)	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.3	APHA-3111(B)
22	Zinc(Zn)	mg/L	0.67	0.82	0.43	0.74	0.75	5	15	APHA-3111 (B)
23	Cadmium(Cd)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	No. Relaxation	APHA-3111 (B)
24	Lead(Pb)	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	No. Relaxation	APHA-3111 (B)
25	Mercury(Hg)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	No. Relaxation	APHA-3112 (B)
26	Nickel (Ni)	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	No. Relaxation	APHA-3111 (B)
27	Arsenic(As)	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.05	APHA-3500 (B)
28	Chromium (Cr+6)	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	No. Relaxation	APHA-3500 Cr-B
29	Phenolic Compound (C ₆ H ₅ OH)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.002	APHA-5530
30	Conductivity (25 °C)	mhos/cm	714.80	641.86	610.37	543.92	574.7	Not Specified	Not Specified	APHA-2510
31	E. Coli	Coli/100ml	Absent	Absent	Absent	Absent	Absent	Shall Not Be Detectable	---	IS:1622-1981
32	Total Coliform	MPN/100ml	Absent	Absent	Absent	Absent	Absent	Shall Not Be Detectable	---	IS:1622-1981
33	Temperature	°C	20.39	17.18	18.39	18.58	18.9	Not Specified	Not Specified	IS:3025 (Pt-9)
34	Sodium (Na)	mg/L	51.87	33.57	29.89	47.61	48.6	Not Specified	Not Specified	APHA-3500 (Na)

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35	Fecal Coliform	MPN/100ml	Absent	Absent	Absent	Absent	Absent	Shall Not Be Detectable	APHA-9221
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3.8.3.2 Interpretation of Ground Water Quality

- All the samples were colourless meeting desirable norms (<5 Hazen).
- All the samples meet the desirable standards (pH ranges from 7.15 to 7.41).
- TDS in samples ranges from 370.3mg/L to 514.5mg/L. All the samples meet the permissible limit of 2000 mg/L.
- Total Hardness in the water ranges from 155.4mg/L to 255.1mg/L. All the samples meet the permissible limit of 600 mg/L.
- Calcium content in the water ranges from 57.0mg/L to 77.9mg/L all the samples meet the permissible limit of 200 mg/L.
- Magnesium(Mg) content in the water ranges from 7.17mg/L to 12.25mg/L. All the samples meet the permissible limit of 100 mg/L.
- Sulphate content in the water ranges from 32.78mg/L to 49.07mg/L. The permissible limit of Sulphate is 400 mg/L for drinking water.
- Total alkalinity in the water samples ranges from 109.7mg/L to 170.3mg/L. All the samples are within the permissible limit of drinking water (600 mg/L).
- Chloride ranges from 82.2mg/L to 114.8 mg/L. Which are below permissible limits (1000 mg/l).

3.8.3.3 Result & conclusion

The examination of the physicochemical analysis of the ground water shows that the quality of ground water is generally good with respect to the limits laid down in Bureau of India Standards (IS: 10500:2012) for drinking water. Based on the above result it is concluded that the ground water samples are fit for drinking purpose.

3.8.4 Surface water

Surface Water Quality monitoring is carried out in the study area of 10 km based on the land use pattern and ground truth of nearby villages. Surface water samples were collected from **04** locations during the study period of **1st March 2023 to 31st May 2023** and analyzed for a number of physico-chemical parameters. The surface water parameters have been analyzed as per APHA procedure and compared with CPCB water quality criteria mentioned in Table 3.9 and the Surface water sample results are mentioned in Table-3.11.

Table No 3- 9: Water Quality Criteria as per Central Pollution Control Board

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/l or more Biochemical Oxygen Demand 5 days 20°C 2mg/l or less
Outdoor bathing (Organized)	B	Total Coliforms Organism MPN/100ml shall be 500 or less; pH between 6.5 and 8.5; Dissolved Oxygen 5mg/l or more Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Drinking water source after conventional treatment and disinfection	C	Total Coliforms Organism MPN/100ml shall be 5000 or less; pH between 6 to 9; Dissolved Oxygen 4mg/l or more Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Propagation of Wild life and Fisheries	D	pH between 6.5 to 8.5 Dissolved Oxygen 4mg/l or more Free Ammonia (as N) 1.2 mg/l or less
Irrigation, Industrial Cooling, Controlled Waste disposal	E	pH between 6.0 to 8.5 Electrical Conductivity at 25°C micro mhos/cm Max.2250 Sodium absorption Ratio Max. 26 Boron Max. 2mg/l
	Below-E	Not Meeting A, B, C, D & E Criteria

Table No 3- 10: Surface water monitoring locations

S.No	Name	Distance & Direction from project site	Co-ordinates
SW1	Pond	1.3 Km, WNW	24°29'25.18"N 84°35'24.49"E
SW2	Pankriguria, Pond	1.7 Km, NNW	24°30'2.86"N 84°35'55.38"E
SW3	Pond	1.5 Km, SE	24°28'37.37"N 84°37'1.53"E
SW4	Pond, Chuabar	1.4 Km, ENE	24°28'56.04"N 84°37'5.04"E



Figure 3- 14: Map showing Surface Water Monitoring Locations

Table No 3- 11: Surface Water Monitoring Results

S. No.	Test Parameters	Unit	SW 1	SW 2	SW 3	SW 4	Test Method
1	Colour	Hazen	<5.0	<5.0	<5.0	<5.0	IS:3025 (Pt-4)
2	Odour	---	Agreeable	Agreeable	Agreeable	Agreeable	IS:3025 (Pt-5)
3	pH	---	7.57	7.74	8.19	8.36	IS:3025 (Pt-11)
4	Turbidity	NTU	11.13	9.05	14.15	11.8	IS:3025 (Pt-10)
5	Total Dissolve Solid (TDS)	mg/L	568.4	500.4	487.3	389.2	IS:3025 (Pt-16)
6	Total Alkalinity (CaCO ₃)	mg/L	239.2	182.7	208.0	175.1	IS:3025 (Pt-23)
7	Total Hardness(CaCO ₃)	mg/L	284.1	228.9	174.1	146.7	IS:3025 (Pt-21)
8	Chloride (Cl)	mg/L	124.4	52.6	88.9	74.9	IS:3025 (Pt-32)
9	Calcium (Ca)	mg/L	80.9	43.8	63.8	53.7	IS:3025 (Pt-40)
10	Mineral Oil	mg/L	<0.01	<0.01	<0.01	<0.01	IS:3025 (Pt-39)
11	Sulphate (SO ₄)	mg/L	45.6	35.9	53.0	44.7	IS:3025 (Pt-24)
12	Nitrate (NO ₃)	mg/L	1.21	2.94	1.02	2.19	IS:3025 (Pt-34)
13	Fluoride (F)	mg/L	0.20	0.27	0.41	0.35	IS:3025 (Pt-60)
14	Iron (Fe)	mg/L	0.33	0.31	0.21	0.18	IS:3025 (Pt-53)
15	Aluminium (Al)	mg/L	<0.01	<0.01	<0.01	<0.01	APHA-3500 (B)
16	Selenium (Se)	mg/L	<0.01	<0.01	<0.01	<0.01	APHA-3113 (B)
17	Cyanide (Cn)	mg/L	<0.02	<0.02	<0.02	<0.02	APHA-4500 (C)
18	Copper(Cu)	mg/L	<0.05	<0.05	<0.05	<0.05	APHA-3111(B)
19	Magnesium (Mg)	mg/L	15.32	13.31	12.51	10.53	IS:3025 (Pt-45)
20	Manganese(Mn)	mg/L	<0.1	<0.1	<0.1	<0.1	APHA-3111(B)
21	Zinc(Zn)	mg/L	0.53	0.18	0.75	0.64	APHA-3111 (B)
22	Cadmium(Cd)	mg/L	<0.001	<0.001	<0.001	<0.001	APHA-3111 (B)
23	Lead(Pb)	mg/L	<0.01	<0.01	<0.01	<0.01	APHA-3111 (B)
24	Boron	Mg/L	<0.05	<0.05	<0.05	<0.05	IS:3026(Pt-57)

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25	Mercury(Hg)	mg/L	<0.001	<0.001	<0.001	<0.001	APHA-3112 (B)
26	Molybdenum(mo)	mg/L	<0.05	<0.05	<0.05	<0.05	IS:3025(Pt-2)
27	Nickel (Ni)	mg/L	<0.01	<0.01	<0.01	<0.01	APHA-3111 (B)
28	Arsenic(As)	mg/L	<0.01	<0.01	<0.01	<0.01	APHA-3500 (B)
29	Chromium (Cr+6)	mg/L	<0.01	<0.01	<0.01	<0.01	APHA-3500 Cr-B
30	Conductivity (25 °C)	µs/Cm	749.1	787.1	647.7	536.5	APHA-2510
31	Chemical Oxygen Demand (COD)	mg/L	22.75	18.31	20.91	17.23	APHA-5220 (B)
32	Biological Oxygen Demand (BOD at 27°C for 3 day)	mg/L	3.65	3.73	3.43	2.89	APHA-4500 (D)
33	Dissolve Oxygen (DO)	mg/L	4.15	5.18	4.74	4.00	APHA-5210
34	E. Coli	MPN/100ml	170	210	180	150	IS:1622-1981
35	Total Coliform	MPN/100ml	230	340	260	190	IS:1622-1981

3.8.4.1 Observation on Surface water Quality

The baseline quality of water based on the results of the surface water quality monitoring within the study area, it is observed that,

- pH was observed in the range of 7.57– 8.36 with minimum at Pond (SW1) and maximum at (SW4) Pond, Chuabar.
- TDS was in the range of 389.2 – 568.4 mg/L with minimum at Pond, Chuabar(SW4) and maximum at Pond (SW1).
- COD was in the range of 17.23 – 22.75 mg/L with minimum at Pond, Chuabar (SW4) and maximum at Pond (SW1).
- BOD was in the range of 2.89 -3.73 mg/L with minimum Pond, Chuabar (SW4) and maximum at Pankriguria, Pond (SW2).

3.8.4.2 Result & Conclusion

The Pond water quality parameters are compared with BDU Criteria of CPCB. No metal contamination has been found in surface water samples. Overall, the surface water quality of river is meeting the Class D of DBU Criteria of CPCB for its suitability for wild life and fisheries.

3.9 Air Environment

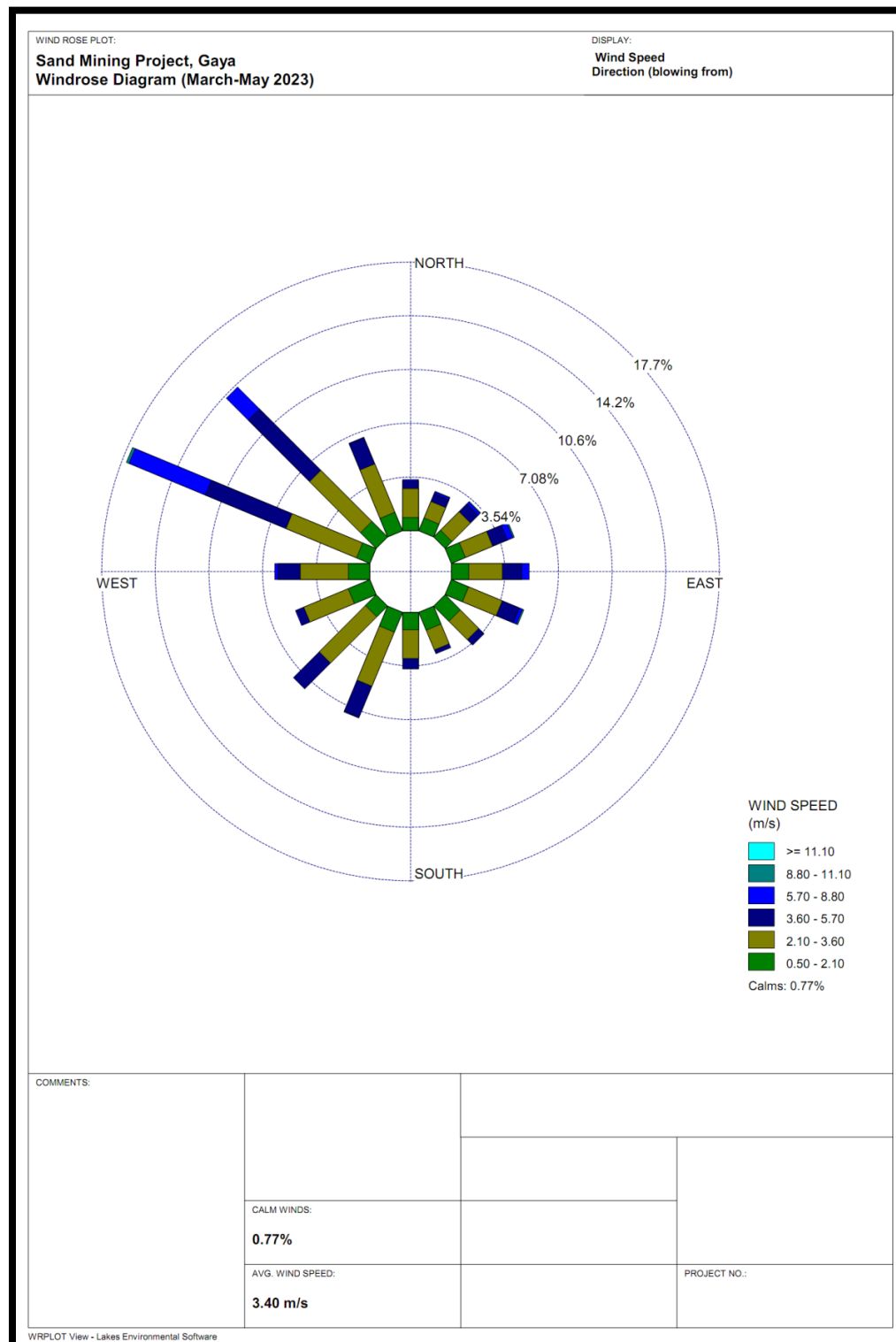
3.9.1 General

This section describes the prevailing air environment in the study area for evaluating the impacts of mining activity in surrounding areas. This has been achieved by determining the ambient air quality within the study area, represented by 10 km radius area around the project site, as shown in Figure 3.16. Ambient air quality monitoring stations were selected primarily on the basis of surface influence, demographic influence and meteorological influence. 24 hourly monitoring was carried out for SO₂, NO₂, PM₁₀& PM_{2.5} twice a week at each station. This study was done during winter season from **1st March 2023 to 31st May 2023**. The analysis reports are appended below in the Table-3.12.

Table No 3- 12: Site-specific meteorological data

	March	April	May
Avg. Temperature °C (°F)	25.9 °C (78.6) °F	31.3 °C (88.4) °F	33 °C (91.5) °F
Min. Temperature °C (°F)	18.1 °C (64.7) °F	23.5 °C (74.3) °F	26.6 °C (79.8) °F
Max. Temperature °C (°F)	33.2 °C (91.7) °F	38.6 °C (101.5) °F	39.3 °C (102.7) °F
Precipitation / Rainfall mm (in)	10 (0)	9 (0)	27 (1)
Humidity(%)	38%	29%	41%
Rainy days (d)	2	2	4
avg. Sun hours (hours)	10.7	11.4	11.6

Source: - <https://en.climate-data.org/asia/india/bihar/gaya-2840/>



The prominent seasonal wind direction is from **WNW to ESE**. The average wind speed is **3.40 m/s**.

3.9.2 Methodology

The choice of monitoring locations for ambient air quality is based on:

1. Meteorology of the area: From the meteorological data the frequency and duration of wind is preliminary determined, from which the wind rose diagram is first drawn. Eight monitoring stations have been selected to assess the Air quality in study area.
2. The location of nearest human habitation is also considered for selecting the location of air quality monitoring station. The quality of air at this location is important to know the impact of the proposed mining activities in terms of emission of particulate matter and gaseous emissions.
3. It is equally important to know the accessibility to the selected air quality stations. Therefore, the availability of roads along with electricity also plays an important role in finalizing the ambient air quality monitoring locations.

Based on these factors, eight monitoring locations were identified as shown in Table 3.13 and Figure 3.16. CPCB guidelines for the measurement of ambient air quality on 24 hourly monitoring was carried out for SO₂, NO₂, PM_{2.5} & PM₁₀ twice a week at each station for a study period of 3 months 1st March 2023 to 31st May 2023.

Table No 3- 13: Ambient Air monitoring locations

S.No	Name	Distance & Direction from project site	Co-ordinates
AAQ1	Near Project Site	0.28 Km, WNW	24°29'19.11"N 84°36'4.30"E
AAQ2	Bishunbigha	0.50 Km, WNW	24°29'14.60"N 84°35'46.79"E
AAQ3	Panraria	1.5 Km, WSW	24°28'50.25"N 84°35'17.41"E
AAQ4	Pokhraha	1.3 Km, NW	24°29'43.52"N 84°35'38.82"E
AAQ5	Chaubar	1.0 Km, ENE	24°28'54.66"N 84°36'52.35"E
AAQ6	Raunsa	1.3 Km, SE	24°28'24.73"N 84°36'30.64"E

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AAQ7	Kochia	2.45 Km, ESE	24°28'16.50"N 84°37'22.33"E
AAQ8	Jalwar	3.2 Km, SSE	24°27'22.75"N 84°36'54.71"E

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Figure 3- 16: Map showing Ambient Air Quality Monitoring Locations

Table No 3- 14: Ambient Air Quality Monitoring Results (1st March 2023 to 31st May 2023)

Parameter		AQ1	AQ2	AQ3	AQ4	AQ5	AQ6	AQ7	AQ8
		Near Project Site	Bishunbigha	Panrari	Pokhraha	Chaubar	Raunsa	Kochi	Jalwar
PM ₁₀ (µg/m ³)	Min.	70.7	65.8	63.7	74.5	63.7	55.1	59.8	63.7
	Max.	90.4	87.8	81.7	88.0	75.4	73.7	76.9	82.1
	Mean	79.1	75.0	71.0	81.8	69.2	65.4	68.0	72.6
	98 %*	89.8	86.4	79.9	87.7	75.0	73.5	76.3	81.5
PM _{2.5} (µg/m ³)	Min.	37.4	31.6	30.8	42.0	36.4	29.4	32.5	36.8
	Max.	49.6	46.5	46.6	50.0	44.6	40.1	41.8	46.2
	Mean	42.2	38.5	37.3	46.3	41.5	34.3	38.5	41.2
	98 %*	48.8	44.3	45.2	49.9	44.4	39.7	41.6	45.4
SO ₂ (µg/m ³)	Min.	9.6	8.3	8.0	9.1	5.9	7.0	6.6	8.5
	Max.	15.5	14.8	13.3	17.2	11.7	15.4	10.7	15.4
	Mean	13.1	10.9	10.0	13.7	9.7	11.1	9.2	10.2
	98 %*	15.3	14.3	13.0	17.2	11.7	15.2	10.6	14.5
NO _x (µg/m ³)	Min.	22.0	19.2	14.6	22.4	19.5	24.3	17.9	17.0
	Max.	35.9	29.3	26.1	39.0	30.6	37.5	30.9	31.5
	Mean	28.2	24.1	19.9	28.8	24.0	29.9	24.2	23.3
	98 %*	34.8	28.9	26.0	36.9	29.5	37.2	30.7	30.4
(CO) (mg/m ³)	Min.	0.24	0.17	0.26	0.20	0.34	0.32	0.29	0.27
	Max.	0.54	0.49	0.66	0.61	0.83	0.80	0.76	0.82
	Mean	0.41	0.35	0.48	0.45	0.52	0.50	0.51	0.51
	98 %*	0.53	0.49	0.65	0.60	0.81	0.76	0.74	0.80

3.9.3 Results

The ambient air quality study for the monitoring stations shows that the maximum and minimum ground level concentration for PM₁₀ is respectively **90.4 µg/m³ at NEAR PROJECT SITE, (AAQ1)** and **55.1 µg/m³ at Raunsa (AAQ 6)**. Whereas the maximum and minimum ground level concentration for PM_{2.5} ranges between **50.0 µg/m³ at Pokhraha (AAQ 4)** and **29.4 µg/m³ at Raunsa (AAQ6)**. respectively. Similarly, for SO₂, the maximum and minimum ground level concentration varies between **17.2 µg/m³** and **5.9 µg/m³** for respectively **Pokhraha (AAQ 4)**

and **Chaubar (AAQ5)** stations. For NO₂ the maximum and minimum ground level concentration varies between **39.0 µg/m³** & **14.6 µg/m³** for respectively **Pokhraha (AAQ 4)** and **Panraria (AAQ)** stations. For CO the maximum and minimum ground level concentration varies between **0.83 mg/m³** & **0.17 mg /m³** for respectively **Chaubar (AAQ5)** and Bishunbigha (AAQ2) stations.

3.10 Noise Environment

3.10.1 General

The ambient noise levels within the study area were recorded using Sound Level Meter. Noise level monitoring results were compared with the Ambient Noise Quality Standard notified under Environment Protection Act, 1986 and amended thereof.

3.10.2 Methodology

The proposed project activity is expected to affect ambient noise quality in the surrounding areas only by the movement of sand excavation and sand carrying vehicles. Therefore, the choice of monitoring locations is based on human habitation factors. Table 3.15 and Figure 3.17 shows noise quality monitoring locations.

Table No 3- 15: Noise Quality Monitoring Stations

S.No	Name	Distance & Direction from project site	Co-ordinates
NQ1	Near Project Site	0.28 Km, WNW	24°29'19.11"N 84°36'4.30"E
NQ2	Bishunbigha	0.50 Km, WNW	24°29'14.60"N 84°35'46.79"E
NQ3	Panraria	1.5 Km, WSW	24°28'50.25"N 84°35'17.41"E
NQ4	Pokhraha	1.3 Km, NW	24°29'43.52"N 84°35'38.82"E
NQ5	Chaubar	1.0 Km, ENE	24°28'54.66"N 84°36'52.35"E
NQ6	Raunsa	1.3 Km, SE	24°28'24.73"N 84°36'30.64"E
NQ7	Kochia	2.45 Km, ESE	24°28'16.50"N 84°37'22.33"E
NQ8	Jalwar	3.2 Km, SSE	24°27'22.75"N

			84°36'54.71"E
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Table No 3- 16: Noise Level Status

S. No.	Locations		Equivalent Noise Level, dB (A)			
			Limit (as per CPCB Guidelines), Leq, dB(A)		Observed value Leq, dB(A)	
			DAY*	NIGHT*	DAY*	NIGHT*
1	Near Project Site	Residential Zone	55	45	48.2	35.4
2	Bishunbigha	Residential Zone	55	45	50.3	38.5
3	Panraria	Residential Zone	55	45	46.1	35.1
4	Pokhrraha, Kochia	Residential Zone	55	45	52.6	37.1
5	Chaubar	Residential Zone	55	45	46.7	34.8
6	Raunsa	Residential Zone	55	45	47.3	34.8
7	Kochia	Residential Zone	55	45	52.6	37.3
8	Jalwar	Residential Zone	55	45	49.2	33.5

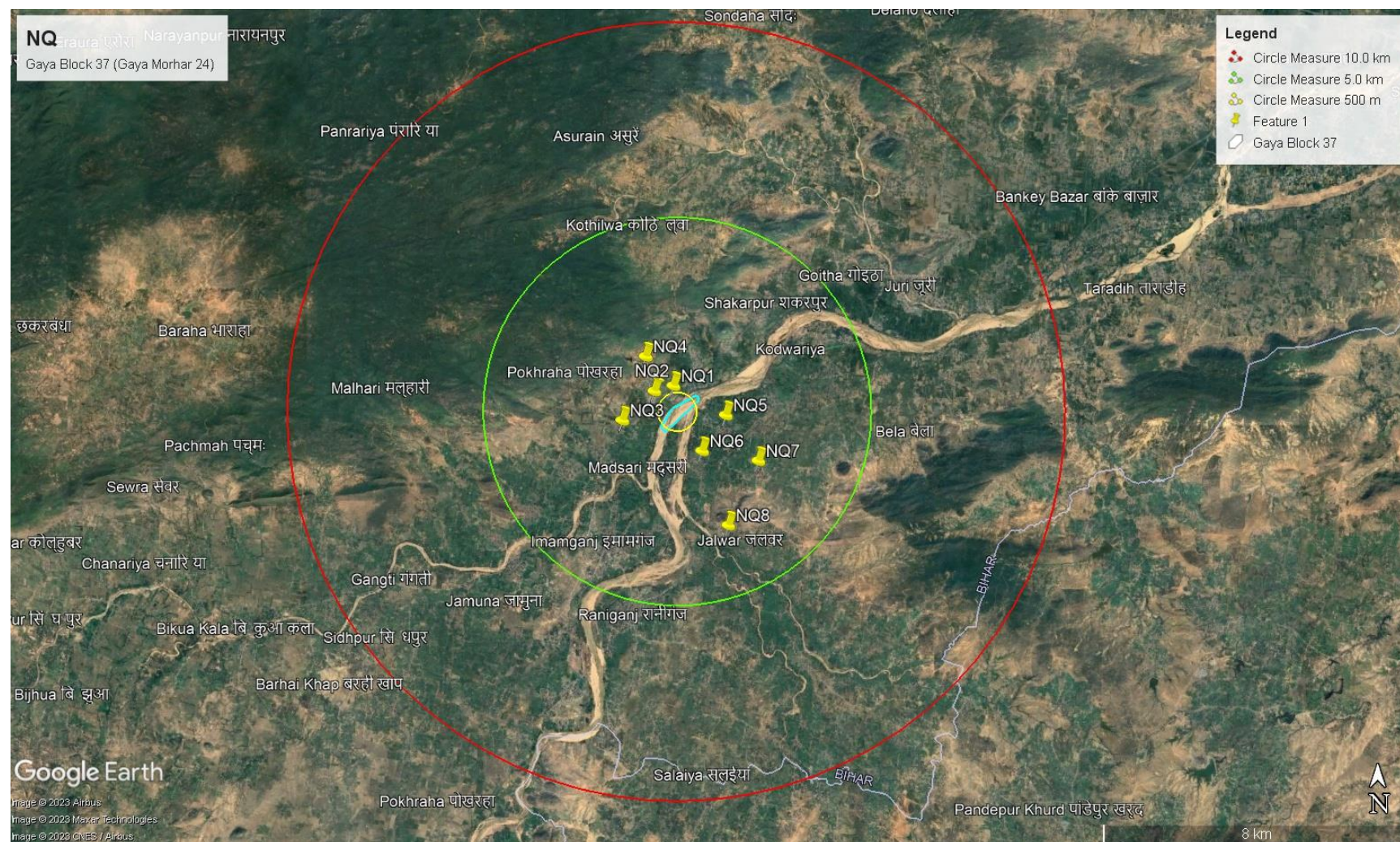


Figure 3- 17: Map showing Noise Quality Monitoring Locations

3.10.3 Results

Noise monitoring study reveals that the minimum & maximum noise levels at day time were recorded as **46.1 dB (A)** at Panraria (NQ3) & **52.6 dB (A)** at Pokhaha and Kochia (NQ 4 and NQ 7). The minimum & maximum noise levels at night time were found to be **33.5 dB (A)** at Jalwar (NQ 8) & **38.5 dB (A)** at Bishunbigha (NQ 2).

There are no other major noise producing sources in the study area except some domestic activities, which contributes to the local noise level of the area. Traffic movements in nearby villages also add to the ambient noise level of the area.

3.11 Biological Environment

3.11.1 Introduction

Biological study is essential to understand the impact of industrialization and urbanization on existing flora and fauna of the study area. Forests are repository of the bio-diversity, gene pool resources, sequester carbon dioxide and provide lot of other environmental services. They play a very vital role in sustaining the life of people and are crucial for the food and water security. The hydrological functions of forests include interception of rainfall and regulating the stem flows, binding soil to prevent soil erosion and conserving the soil moisture.

Studies on various aspects of ecosystem play an important role in identifying sensitive issues for under taking appropriate action to mitigate the impact, if required.

A baseline survey was conducted to study floral and faunal diversity of the terrestrial and aquatic environment of the study area within in 10 Km radius of the plant site.

3.11.2 METHODOLOGY

The biological information has been collected through field studies, conversation with local people and collection of available literature from relevant institutions/ organizations. A participatory and consultative approach was followed. Field visits were undertaken for survey of the vegetation and animals in the study area. The study area has been divided into two parts as core area consisting of project site and the buffer area as the 10 km radius of the project site.

3.11.3 Results and Discussion

The primary survey of study area was conducted particularly with reference to habitat types, listing of species and assessment of the existing baseline ecological (terrestrial and aquatic ecosystem) conditions.

There is no national park, wildlife sanctuary and critically polluted area in 10km radius from the project site. There are no forests within 5 Km from the boundary of the project site.

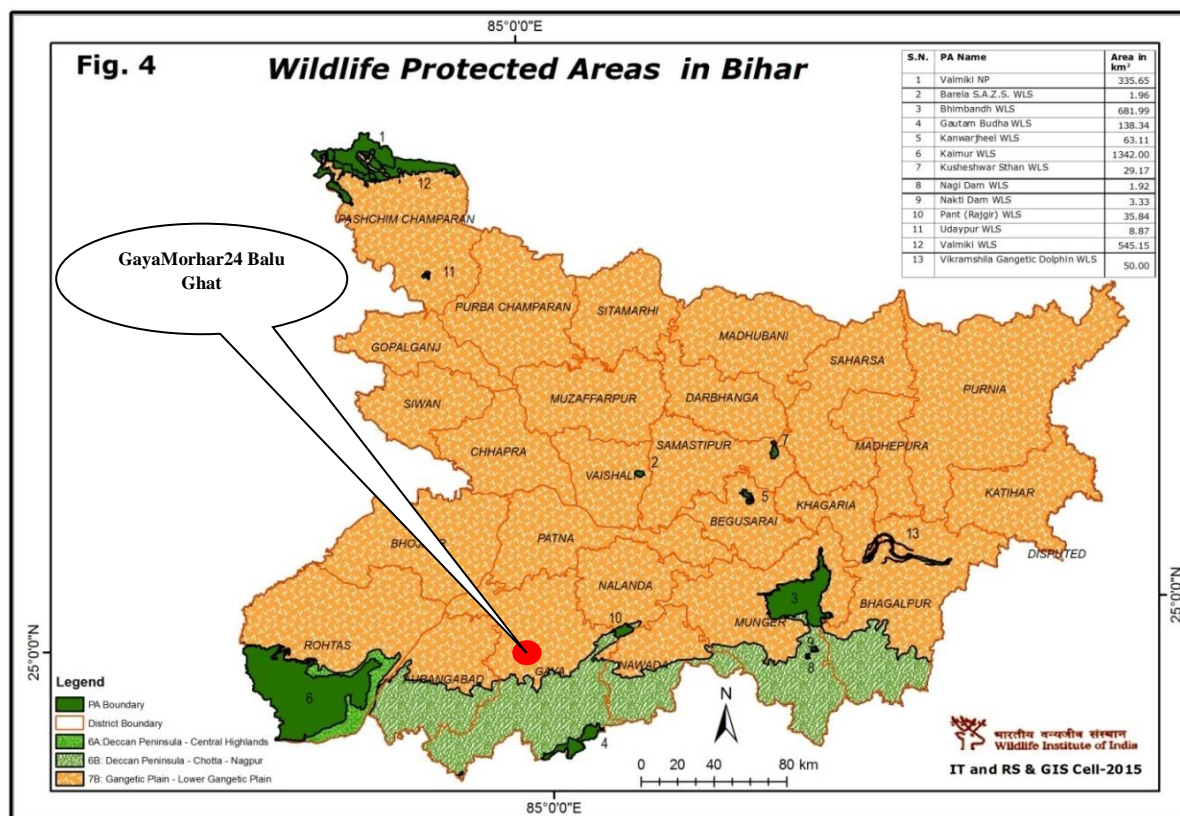


Figure 3- 18: Wildlife Protected area of Bihar

3.11.4 Floral biodiversity

Core Zone: The core zone was devoid of any plant or tree naturally growing over there. The agro-biodiversity of the study area is unique and there is no reserve or protected forest. The core zone is a long stretch of river sand and no flora was found in the core zone.

Buffer Zone: Some of the most dominant species in not forest area are Babool (*Vachellia nilotica*), Neem (*Azadirachta indica*), Lantana (*Lantana pastazensis*), etc. were observed within 10 km radius of the study area. Other shrub, herb and grass species like Aloe Vera (*Aloe vera*), Sadabahar (*Catharanthus roseus*) and Doob grass (*Cynodon dactylon*) were also recorded.

The important floras of the study area are given in **Table 3-17**.

Table No 3- 17: Flora (Trees) of the Study Area

S. NO.	Common Name	Botanical Name	Family Name
Shrubs/herbs/Climbers			
1.	Aloe vera	<i>Aloe vera</i>	Asphodelaceae
2.	Holy Basil (Tulsi)	<i>Ocimum sanctum</i>	Lamiaceae
3.	Harsingar	<i>Nyctanthes arbor-tristis</i>	Oleaceae
4.	Nag Phani	<i>Opuntia elatior</i>	Cactaceae

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5.	Sadabahar	<i>Catharanthus roseus</i>	Apocynaceae
6.	Tick Weed	<i>Cleome viscosa</i>	Cleomaceae
7.	Yellow Kaner	<i>Thevetia peruviana</i>	Apocynaceae
8.	Common Lantana	<i>Lantana pastazensis</i>	Verbenaceae
Trees			
9.	Amla	<i>Phyllanthus emblica</i>	Phyllanthaceae
10.	Amaltas	<i>Cassia fistula</i>	Fabaceae
11.	Arjun Tree	<i>Terminalia arjuna</i>	Combretaceae
12.	Babool	<i>Vachellia nilotica</i>	Fabaceae
13.	Banyan	<i>Ficus benghalensis</i>	Moraceae
14.	Elephant Apple	<i>Dillenia indica</i>	Dilleniaceae
15.	Guava	<i>Psidium guajava</i>	Myrtaceae
16.	Gulmohar	<i>Delonix regia</i>	Fabaceae
17.	Imli	<i>Tamarindus indica</i>	Fabaceae
18.	Jackfruit	<i>Artocarpus heterophyllus</i>	Moraceae
19.	Kadamb	<i>Neolamarckia cadamba</i>	Rubiaceae
20.	Mango	<i>Mangifera indica</i>	Anacardiaceae
21.	Neem	<i>Azadirachta indica</i>	Meliaceae
22.	Peepal	<i>Ficus religiosa</i>	Moraceae
23.	Sisham	<i>Dalbergia sissoo</i>	Fabaceae
24.	Teak	<i>Tectona grandis</i>	Lamiaceae
25.	Vilayati Babool	<i>Prosopis juliflora</i>	Fabaceae
Grasses			
26.	Bermuda grass	<i>Cynodon dactylon</i>	---
27.	Doob	<i>Cynodon dactylon</i>	Poaceae

Source : (i) * Field Observation and discussion with local people in Study Area,

3.11.5 Faunal Biodiversity

The core of the project site is the sandy river bed of Morhar river. The fauna visiting core zone includes snakes (*Ptyas mucosus*), rats (*Mus buduga*), crows (*Corvus splendens*) etc. As per the information collected by the field team, the common animals of the study area are frogs (*Hoplobatrachus tigerinus*), Indian garden lizards (*Calotes versicolor*), House lizards (*Hemidactylus frenatus*) etc. In addition, the commonly found domestic animals such as cow, dog, cat etc. and lower life forms such as ants, spider, butterfly, bee, wasp, and termite are also found in the study area. The common birds inhabiting in the study area are Bulbul (*Pycnonotus cafer*), Pigeon (*Columba livia*), and Koel (*Eudynamys scolopaceus*).

Table 3-18 gives a list of fauna in the study area.

Table No 3- 18: Fauna of the Study Area

Sr.No.	Common Names	Scientific Name	Wildlife Schedule
Amphibians			
1	Common Indian Green Frog	<i>Rana hexadactyla</i>	Schedule-IV
2	Indian Bull Frog	<i>Hoplobatrachus tigerinus</i>	Schedule-IV
3	Indian Cricket Frog	<i>Fejervaryali mnocharis</i>	Schedule-IV
Reptiles			
1	Indian cobra	<i>Naja naja</i>	Schedule II: Part -II
2	Common Dotted Garden Skink	<i>Lygosoma punctata</i>	Schedule-IV
3	Indian garden lizards	<i>Calotes versicolor</i>	Schedule-IV
4	House Lizards	<i>Hemidactylus frenatus</i>	Schedule-IV
5	Golden Skink	<i>Mabuya carinata</i>	Schedule-IV
6	Rat snake	<i>Ptyas mucosus</i>	Schedule II: Part -II
Mammals			
1.	Bengal Fox	<i>Vulpes benghalensis</i>	Schedule- II, Part- I
2.	Black Rat	<i>Rattus rattus</i>	Schedule-V
3.	Domestic Cow	<i>Bos Taurus</i>	Schedule-IV
4.	Golden Jackal	<i>Canis aureus</i>	Schedule- II
5.	Indian Flying Fox	<i>Pteropus giganteus</i>	Schedule- V
6.	Indian palm squirrel	<i>Funambulus pennantii</i>	Schedule-IV
7.	House Goat	<i>Capra hircus</i>	Schedule-IV
8.	Indian Field Rat	<i>Mus booduga</i>	Schedule-V
9.	Indian Hare	<i>Lepus nigricollis</i>	Schedule-IV
10.	Indian Pariah Dog	<i>Canis lupus familiaris</i>	Schedule-IV
11.	Lesser Bandicoot	<i>Bandicota bengalensis</i>	Schedule-IV
12.	Rhesus macaque	<i>Macaca mulatta</i>	Schedule- IV
13.	Water Buffalo	<i>Bubalus bubalis</i>	Schedule-IV
Aves			

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Sr.No.	Common Names	Scientific Name	Wildlife Schedule
1.	Asian Koel	<i>Eudynamys scolopaceus</i>	Schedule-V
2.	Black kite	<i>Milvus migrans</i>	Schedule-IV
3.	Common Myna	<i>Acridotheres tristis</i>	Schedule-IV
4.	House Crow	<i>Corvus splendens</i>	Schedule-IV
5.	House Sparrow	<i>Passer domesticus</i>	Schedule-IV
6.	Indian Pond Heron	<i>Ardeola grayii</i>	Schedule-IV
7.	Indian Roller	<i>Coracias benghalensis</i>	Schedule-IV
8.	Jungle Babbler	<i>Turdoides striata</i>	Schedule-IV
9.	Purple Sunbird	<i>Cinnyris asiaticus</i>	Schedule-IV
10.	Red- Vented Bulbul	<i>Pycnonotus cafer</i>	Schedule-IV
11.	Rock Pigeon	<i>Columba livia</i>	Schedule-IV
12.	Rose- ringed Parakeet	<i>Pssitaculata krameri</i>	Schedule-IV
13.	Spotted Dove	<i>Spilopelia chinensis</i>	Schedule-IV
14.	Yellow Wattled Lapwing	<i>Vanellus malabarica</i>	Schedule-IV

Insects

S. No.	Common Name	Scientific Name	Family Name
1.	Crab spiders	<i>Thomisus spectabilis</i>	Thomicidae
2.	Common Wanderer (Butterfly)	<i>Pareronia valeria</i>	Pieridae
3.	Common Social Wasp	<i>Ropalidia marginata</i>	Vespidae
4.	Fire ants (red ants)	<i>Selonopsis invicta)</i>	Formicidae
5.	Indian Drywood Termites	<i>Cryptotermes dudleyi</i>	Termitoideae
6.	House Cricket	<i>Acheta domesticus</i>	Gryllidae
7.	Lady Bug	<i>Coccinella septempunctata</i>	Coccinellidae

Most of animals found in the study area are of least concern.

3.12 Socio-Economic Environment

This section of the EIA report deals with Socio-Economic Impact assessment of the Proposed Sand Mining Project of Area 29.0 Ha at Block- 37(Gaya Morhar -24), **Mauza- Babandih, Padaria, Pakri Guriya & Chuawar, Anchal- Imamganj, District- Gaya, State- Bihar** on Morhar River.

Data Collection: Following steps were considered for the collection of primary data:

1. Identifying of Study Area

2. Site Visit
3. Analysis of Data Collected

The data on socio-economic aspects in the study area has been carried out through the analysis of the primary data as well as secondary data available for the study area.

The broad objectives of the socio-economic impact assessment are as follows:

- a) To study the socio-economic status of the people living in the study area of the Proposed Sand Mining Project.
- b) To assess the impact on socio-economic environment due to Proposed Sand Mining Project.
- c) To assess the impact of the project on State Gross Domestic Product (SGDP)
- d) To evaluate the community development measures proposed to be taken up by the Project Proponent, if any.
- e) To suggest Community Development measures needs to be taken for the study area

3.12.1 Methodology

The methodology adopted for impact assessment is as follows:

- a) The details of the activities and population structure have been obtained from Census 2011 and analyzed.
- b) Primary data was collected by a door-to-door survey in urban area and household's living therein. The data collected during the above survey were analyzed to evaluate the prevailing socio-economic profile of the area.
- c) Based on the above data, impacts due to construction operation on the community have been assessed and recommendations for further improvement have been made

3.12.2 Demography structure of the district

The district of Gaya with a population of 4391418 according to 2011 Census, is divided into 24 Community Development Blocks, Comprising 2886 villages and 4 towns. With 4.2 percent of the total population of the state comprised within the district, Gaya is a large sized district and ranks 5th in the state in order of population. The population of males and females are 2266566 and 2124852 spread over 5.3 percent area of the State. Gaya Town C.D. Block is the most populous while Atri is the least populated C.D. Block in the district. The Sex ratio of district is 937 females for every 1,000 males. The sex ratio of rural and urban areas is 943 and 901 respectively. The highest sex ratio of 985 is recorded in Mohanpur Sub- district and the lowest of 907 Gaya Town C.D Block Sub- district.

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(Source: District Census Handbook Gaya)

Table No 3- 19: List of Villages in Study Area

Sl. No.	Village/Town	Urban/Rural	Number of households	H.H. Size	Total population - Person	Total population – Males	Total population - Females	Pers ons aged 0 to 6	Mal es age d 0 to 6	Fema les aged 0 to 6
1	Malhari	Rural	1017	6	6138	3212	2926	1086	571	515
2	Nagobar	Rural	66	4	253	140	113	44	26	18
3	Tarwan	Rural	156	7	1128	573	555	199	98	101
4	Kundil	Rural	153	7	1054	542	512	159	85	74
5	Khapraundh	Rural	72	7	525	272	253	107	54	53
6	Dumranwan	Rural	481	6	2776	1456	1320	442	222	220
7	Nauhar	Rural	89	6	571	299	272	104	54	50
8	Baramh Chak	Rural	10	4	35	19	16	5	2	3
9	Tilaiya	Rural	317	6	1936	999	937	333	156	177
10	Diguriya	Rural	253	5	1388	723	665	233	107	126
11	Geyan Khap	Rural	73	7	523	267	256	68	32	36
12	Naua Khap	Rural	78	7	551	287	264	101	54	47
13	Khajuriya	Rural	190	6	1145	568	577	237	116	121
14	Danheta	Rural	247	6	1444	722	722	294	148	146
15	Kharar	Rural	121	7	889	450	439	170	87	83
16	Kharanti	Rural	17	9	153	82	71	29	17	12
17	Sondaha	Rural	294	7	1936	979	957	410	203	207
18	Lutua	Rural	688	7	5018	2584	2434	1079	524	555
19	Hardia	Rural	28	11	302	159	143	57	32	25
20	Asurain	Rural	108	7	798	405	393	118	64	54
21	Genjana	Rural	111	6	664	333	331	155	79	76
22	Malhari	Rural	1017	6	6138	3212	2926	1086	571	515
23	Majhwali	Rural	33	6	189	98	91	37	20	17
24	Kothilwa	Rural	110	7	733	392	341	157	79	78
25	Nagobar	Rural	66	4	253	140	113	44	26	18
26	Niman	Rural	88	5	417	202	215	92	46	46
27	Sidhpur	Rural	223	6	1276	692	584	128	74	54
28	Gangti	Rural	186	5	974	497	477	205	102	103

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29	Jamuna	Rural	274	5	1445	747	698	199	98	101
30	Shakarpu r	Rural	353	5	1830	935	895	305	158	147
31	Goitha	Rural	739	6	4803	2478	2325	744	380	364
32	Juri	Rural	628	6	3499	1810	1689	615	315	300
33	Panraria	Rural	213	7	1472	687	785	196	107	89
34	Pokhraha	Rural	120	6	665	320	345	126	58	68
35	Kauwal	Rural	72	6	413	206	207	93	51	42
36	Pakardih	Rural	613	6	3593	1872	1721	670	344	326
37	Bhat Bigha	Rural	97	5	519	276	243	92	44	48
38	Rohwe	Rural	194	6	1191	590	601	213	101	112
39	Khesra	Rural	107	6	600	279	321	139	76	63
40	Chapara	Rural	91	6	530	274	256	109	52	57
41	Bahera	Rural	239	6	1522	759	763	218	109	109
42	Kunkarai	Rural	227	6	1441	744	697	286	136	150
43	Baraheta	Rural	130	6	763	399	364	92	43	49
44	Jalwar	Rural	106	6	654	340	314	108	52	56
45	Gareriya	Rural	483	6	2832	1410	1422	497	245	252
46	Pasewa	Rural	333	6	2030	1200	830	245	145	100
47	Rangha	Rural	77	6	471	238	233	81	42	39
48	Kusamh	Rural	109	6	681	357	324	143	73	70
49	Ganeshp ur	Rural	81	7	588	312	276	117	61	56
50	Bardih	Rural	121	6	667	332	335	133	63	70
51	Lautar	Rural	22	7	161	82	79	40	19	21
52	Dumri	Rural	52	6	331	178	153	54	28	26
53	Bhaunr	Rural	137	6	762	396	366	136	67	69
54	Tetaria	Rural	169	6	956	496	460	201	103	98
55	Bagea	Rural	158	6	888	445	443	156	68	88
56	Madsari	Rural	168	5	863	435	428	126	62	64
57	Nohata	Rural	217	6	1268	640	628	208	106	102
58	Manka	Rural	223	7	1564	798	766	289	153	136
59	Parsa Chuan	Rural	202	6	1266	653	613	255	120	135
60	Balsot	Rural	198	7	1478	758	720	261	132	129
61	Salwar	Rural	65	8	551	301	250	108	54	54
		Total	13310	6	81504	42051	39453	1443 4	731 4	7120

3.12.3 Demographic structure of the study area

Socio-economic status of the population is an indicator of development of the region. Any developmental project of any magnitude will have a bearing on the living condition and the

economic bearing of the population in particular and the region as a whole. The section delineates the overall appraisal of the socially relevant attributes. The data on socio-economic aspects in the study area has been carried out through the analysis of the secondary data available for the study area.

3.12.4 Population in Core Zone

The project site is vacant area.

3.12.5 Population in Buffer Zone

The study area is involving 61 villages. The Total Population of study area is 81504 individuals and 13310 numbers of households. A comparative assessment has been made for the respective demographic aspects, based on the year 2011 data, which has been discussed in the following sections.

The total population of study area is 81504 the percentages of male & female population are 52% & 48 % respectively. Breakup of the population for male and female is given in Table No. 3-20.

Table No 3- 20: Breakup of the Population

Particulars	Number
No of households	13310
Total population	81504
Male population	42051
Female population	39453
Average family size	6

(Source: As per Census Data 2011)

3.12.6 Social structure

In 2011, about 41 % of the total population belonged to Scheduled Castes (SC) and 0.5 % of the total population belonged to Scheduled Tribes (ST). The distribution of population in the study area by social structure is presented in Table No. 3-21.

Table No 3- 21: Distribution of Population by Social structure in Study Area

Particulars	Number
Total Scheduled Castes	33470
Scheduled Castes Male	17057
Scheduled Castes Female	16413
Total Scheduled Tribes	397
Scheduled Tribes Male	244
Scheduled Tribes Female	153

(Source: As per Census Data 2011)

3.12.7 Literacy levels

In 2011, about 49 % of the total population belonged to Literates population and 51 % of the total population belonged to Illiterates population. The male literacy rate is 60 % and the female literacy rate was 40 %. The details are presented in **Table No. 3-22**.

Table No 3- 22: Distribution of Literates in Study Area

Particulars	Number
Total Literates	40178
Male	23941
Female	16237
Total illiterates	41326
Male	18110
Female	23216

(Source: As per Census Data 2011)

3.12.8 Occupation Pattern of the study area

The occupational structure of the population in the study area has been studied with reference to the total workers and non-workers. Further total workers grouped into two categories main workers and marginal workers. Main workers have been grouped into four categories namely: Cultivators, agricultural labourers, household workers and other workers.

3.12.8.1 Total workers

Work is defined as participation in any economically productive activity with or without compensation, wage. Such participation may be physical and/ or mental in nature. Work involves not only actual work but also include supervision and direction of work. It even includes part time help or unpaid work on farm, family enterprise or its economic activity. All persons engaged in ‘work’ as defined above are workers.

The number of total workers in the study area is 31857 which are 39 % of total population. Out of total 31857workers, which are 19863 males (62 %) and 11994 are Females (38 %). Total workers further divided into main workers and marginal workers.

3.12.8.2 Main workers

Those workers who had worked for the major part of the reference period (i.e., 6 months or more) are term main workers. Total number of main workers is 17794 which are male 71 % & Female 29 % and 22 % of total population.

3.12.8.3 Marginal Workers

The marginal workers are those workers, who are engaged in some work for a period of less than six months, during the reference year prior to the census survey. Total number of marginal workers is 14063 which are approx. 52 % Males & 48% Females.

3.12.8.4 Cultivator

A person is classified as cultivator if he or she is engaged in cultivation of land own or from government or held from private persons or institutions for payment in money, kind or share.

Cultivation work includes effective supervision or direction in cultivation. A person who has given out her/his land to another person or institution(s) for cultivation for money, kind or share of crop and who does not even supervise or direct cultivation process is not treated as cultivator. Similarly, a person working on another person's land for wages in cash or kind or combination of both is not treated as cultivator.

Total cultivators are 3645 which are 11 % of Total workers. The distribution of cultivators is male percentage is 77 % and female percentage is 23 %.

3.12.8.5 Agricultural Labourers

A Persons working on the land of others for wages or share in the yield have been treated as agricultural labourers. The total Agriculture workers of this category are about 9423 which are 12 % of the total population.

3.12.8.6 Other Workers

The Other-workers are in study area 5 % of the total population in 2011. Out of total 4338 Other- workers, males are 3470 while females are 868. Also, the male percentage is 80 % and the female percentage is 20 %.

3.12.8.7 Non-Workers

The non-workers are in study area 61 % of the total population in 2011. Out of total 49647 non- workers, males are 22188 while females are 27459. Also, the male percentage is 45 % and the female percentage is 55 %.

Table No 3- 23: Distribution of Workers in Study Area

S. No.	Particulars	Number of Workers in the study area		
		Total	Male	Female
1.	Total Workers	31857	19863	11994
2.	Main Workers	17794	12617	5177
3.	Marginal Worker	14063	7246	6817
4.	Cultivators	3645	2820	825
5.	Agricultural Labour	9423	6036	3387
6.	Other Workers	4338	3470	868
7.	Non-workers	49647	22188	27459

(Source: As per Census Data 2011)

3.12.9 Rehabilitation & Resettlement (R&R) Action Plan

No further land acquisition required for the project; hence no R & R Action plan is required. There is no Land Acquisition.

3.12.10 Social infrastructure nearby project site

a) Nearest Habitation: -

- Chuawar, approx. 0.86 Km towards SE.

b) Educational Facilities: -

- Primary School, Nagwan. Approx. 6.14 Km towards SSE.
- Vidya Public School, Pakri Guriya Approx 0.45 km, towards North.

c) Medical Facilities:

- Bankey Bazar Hospital (PHC), Tanrawa Approx. 5.19 Km towards West.
- Maa Bhagwati Hospital, Tanrawa Approx. 6.52 km towards NE.

d) Religious facilities: -

- Shiv Mandir, Bishunbigha. Approx. 0.50 Km towards NW.
- Mahadev Temple, Imaliyadih. Approx 0.24km towards WSW.

e) Post office & Police Station: -

- Post office, Pakri Guriya Approx. 1.0 Km towards North direction.
- Imamganj Police Station, approx. 3.5 km towards SSW direction.

f) Drinking water: -Drinking water facility will be provided by the Project proponent. It will be managed by private tankers.

g) Electricity: All the habitations in the study area are provided with electricity and the same is available for domestic.

3.12.11 Impact Assessment & Conclusion

The project activity together with inflow of capital, in-migration and employment of local inhabitants will show positive impact on the overall social and economic condition of the people of the area. The project will provide a direct job opportunity to the local persons as both technical and non-technical workers. Literacy may further increase because of better income and awareness amongst the people. The project will provide direct employment opportunity 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 involvement of unskilled labour. A major part of this labour force is mainly from nearby villages that are expected to engage themselves both in agriculture and project activities. This will enhance their income and lead to overall economic growth of the area. The following socio-economic changes may take place due to project activities:

- The project will have a positive employment and income effect, both direct as well as indirect.
- Expected Improvement of infrastructure & transportation.
- The project will have positive impact on consumption behavior by way of raising average consumption and income through multiplier effect.
- The project will bring changes in the pattern of demand from food to non-food items as sufficient income will generate.
- People located in the project area and in close vicinity, enjoying positive changes in life style and better quality of life.

Table No 3- 24: Demographic particulars of the study area

SL No.	Descriptions	Number	Percentage (%)
1	Total no. of villages in the study area	61	
2	Total Population of the Study Area	81504	
	Male	42051	52
	Female	39453	48
	Sex Ratio (No. of females per 1000 males)	938	
3	0-6 Year Population in Study Area	14434	18
	Male	7314	51
	Female	7120	49
	Sex Ratio (No. of females per 1000 males)	973	
4	Total number of Households	13310	
	Average Household size in the Study Area as a whole	6	
5	Total Population of Schedule Caste Community in the Study Area	33470	41
	Male	17057	51
	Female	16413	49
6	Total Population of Schedule Tribe Community in the Study Area	397	0.5
	Male	244	61
	Female	153	39
7	Total Literates in the Study Area	40178	49
	Male	23941	60
	Female	16237	40
8	Total illiterates in the Study Area	41326	51
	Male	18110	44
	Female	23216	56
9	Total Worker Population	31857	39
	Male	19863	62
	Female	11994	38
10	Main Worker Population	17794	22
	Male	12617	71
	Female	5177	29
11	Marginal Workers	14063	
	Male	7246	52
	Female	6817	48

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12	Cultivators	3645	11
	Male	2820	77
	Female	825	23
13	Agricultural Labour	9423	12
	Male	6036	64
	Female	3387	36
14	Others Workers	4338	5
	Male	3470	80
	Female	868	20
15	Non- Workers	49647	61
	Male	22188	45
	Female	27459	55

Source: Census of India 2011

3.13 Traffic Analysis

Transportation Route:

The minerals excavated will be loaded directly into trucks and transported to the concerned market. The Mining Site Gaya Block 37 (Gaya Morhar24) is well connected to nearest metaled road SH 69 via an approach road of approx. 0.34 km towards NW direction. Two skilled persons were deployed on SH-69 Road for a day on dated 24.04.2023 for traffic analysis. The evacuation route is shown in the map as given below:

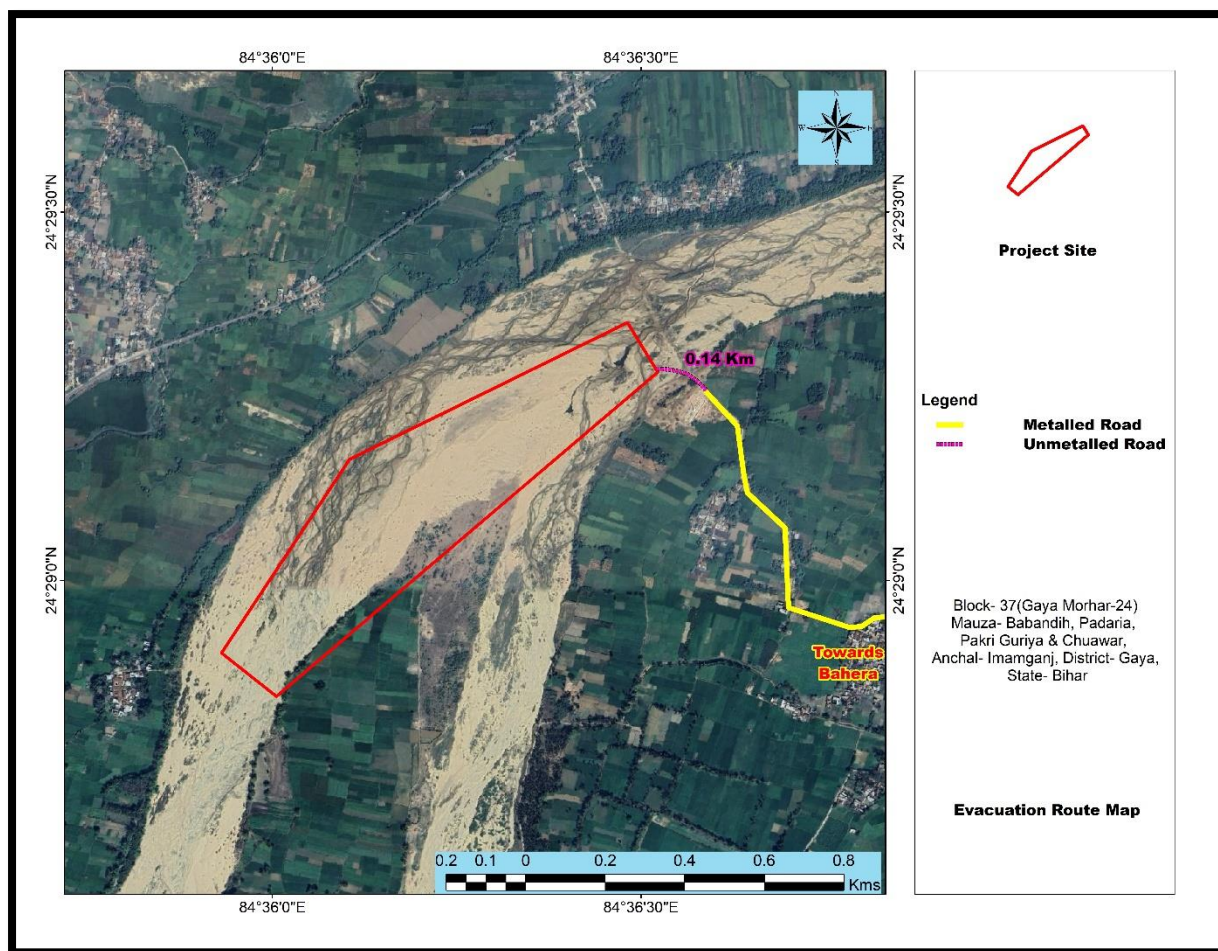


Figure 3- 19: Map Showing Evacuation Route

Traffic analysis is carried out by understanding the existing carrying capacity of the roads near to the project site and the connecting main roads in the area. Then depending on the capacity of the mine, the number of trucks that will be added to the present scenario will be compared to the carrying capacity. 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.

Table No 3- 25: Traffic Analysis

DURING MINE OPERATION						
Proposed Capacity of mine/annum	No. of working days	Proposed Capacity of mine/day	Truck Capacity -tonnes	Frequency of trucks deployed/day	No. of working hours per days	Frequency of trucks deployed/hour
939600 TPA	250	3758.4	12 Ton	313	10	32

Table No 3- 26: Current Traffic Analysis

Classification of Traffic	Adopted PCU Value	Traffic on SH-69	
		ADT (Existing)	PCU (Existing)
Cars	1	700	700
Three-Wheeler	1	120	120
Two-wheeler	0.5	1680	840
Buses	3	120	360
LCV	1.5	445	667
Trucks	3	725	2175
Tractor-Trailer	4.5	455	2047
Cycle	0.5	840	420
Total Vehicles			7329

Existing V/C: $7329/18000 = 0.40$

Table 4.45: Traffic due to proposed Project

Trucks due to proposed project: 313

Trucks per day

PCU: $313 \times 3 = 939$

Cumulative PCUs = $7329+939 = 8268$

V/C: $9998 / 18000 = 0.45$

Table No 3- 27: Capacity as per IRC: 64-1990

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

V/C Ratio for the existing and proposed project comes under 0.6 hence, the Level of Service of the Road will be of C quality i.e., Good to Average LOS.

4 ANTICIPATED IMPACTS AND THEIR MITIGATION MEASURES

4.1 General

All Mining projects, whether existing or new, have positive or negative impacts on the surrounding environment. Depending on the nature of activities and baseline environment status, the impacts are assessed for their importance. The results of these assessments are used to formulate mitigation measures and future methodology for Environmental Monitoring and Environmental Management plan.

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

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 particular situation, predictions have been arrived at based on logical reasoning/consultation/extrapolation.

The following parameters are of significance in the Environmental Impact Assessment and are being discussed in detail:

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

➤ Soil Environment

Based on the environmental baseline scenario as detailed in Chapter 3 and the proposed mining activity in Chapter 2, this chapter assesses the likely impact and their extent on various environmental parameters along with the mitigation measures.

4.2 Land Environment

The proposed extraction of stream bed materials, mining below the existing streambed, and alteration of channel-bed form and shape may lead to several impacts such as erosion of channel bed and banks, increase in channel slope, and change in channel morphology if, the operations are not carried out scientific & systematically.

The mining and allied activities involved due to mining result in creation of temporary haul roads and formation of mined pits, etc. affecting the land use pattern. In this project, silt and clay are also produced as a constituent along with minerals, which are considered to be waste.

4.2.1 Anticipated Impacts

- Mining activity will impact river bed topography by formation of excavation voids.
- Undercutting and collapse of river banks.
- River bed mining may bring in some change in topography at the nearby area of the mine lease.
- Stacks of solid waste generated from mining activity may hinder the flow of water in monsoon season.

4.2.2 Mitigation measures

Adopting suitable, site-specific mitigation measures can reduce the degree of impact of mining on land. Some of the land-related mitigation measures are as follows:

- Excavated pits will get replenished annually in monsoon itself & will be restored to original.
- Excessive sand mining should not be done.
- Mineral will be mined out after leaving safety distances from both side from the bank as “No mining zone “for bank stability.
- The mine working will remain confined to allotted river bed only, so it will not disturb any surface area outside the mine lease area which may affect topography or drainage.
- Solid waste will not be stacked on the bank side as it will hinder the flow of water in monsoon season.

4.3 Water Environment

4.3.1 Anticipated Impacts

Mining of sand from within or near *river* has an indirect impact on the physico-chemical habitat characteristics during monsoon season. These characteristics include in stream roughness elements, depth, velocity, turbidity, sediment transport and stream discharge.

The detrimental effects, if any, to biota resulting from bed material mining are caused by following:

- Alteration of flow patterns resulting from modification of the *river*
- An excess of suspended sediment during monsoon season.

4.3.2 Mitigation measures

Project activity will be carried out only in the dry part of the Morhar River. Hence, none of the project activities affect the water environment directly. In the project, it is not proposed to divert or truncate any stream in monsoon season only. No proposal is envisaged for pumping of water either from the *river* (in monsoon) or tapping the ground water.

In the lean months, the proposed mining will not expose the base flow of the *river* and hence, there will not be any adverse impact on surface hydrology.

The deposit will be worked from the top surface up to a maximum depth of 3 m 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 to allow the excavated area to regain its natural profile.

4.4 Air Environment

4.4.1 Anticipated Impacts

Emission of fugitive dust is envisaged due to:

- Mining Activities includes excavation and lifting of minerals. The whole process will be done by semi-mechanized process without drilling and blasting. Therefore,

the dust generated is likely to be insignificant as compared to mining processes involving drilling, blasting, mechanized loading etc.

- Transportation of minerals will be done by road using trucks. Fugitive dust emission is expected from the transportation of trucks on the haul roads. Evaluation of fugitive dust emission has been done by using line source model as given below:

4.4.2 Air quality modeling

Objective

Atmospheric modelling is used by air quality managers to make decisions on effective and efficient ways to implement the National Ambient Air Quality Standards (NAAQS) and improve air quality. Air quality modelling is done to estimate the relationship between sources of pollution and their effects on ambient air quality, predict the impacts from potential emission sources, and simulate ambient pollution concentrations under different policy scenarios. They are critical for determining the relative contributions from different sources, monitoring compliance of air quality regulations, and making policy decisions

4.4.3 The Air Quality Model

In order to estimate the ground level concentrations due to the emissions from the proposed project, EPA approved American Meteorological Society/Environmental Protection Agency Regulatory Model - AERMOD View 10.0.1 dispersion Model has been used. AERMOD View Dispersion Model provides option to model emissions from a wide range of sources that are present at a typical industrial source complex. The model considers the sources and receptors in undulated terrain as well as plain terrain and the combination of both. The basis of the model is the steady state Gaussian Plume Equation, with modifications to model simple point source emissions from stacks that experience the effect of aerodynamic down wash due to nearby buildings, isolated vents, multiple vents, storage piles etc. AERMOD View dispersion model with the following options has been used to predict the cumulative ground level concentrations due to the proposed emissions. Area being rural, the rural dispersion parameters are considered as below:

- Predictions have been carried out to estimate concentration values over radial distance of 10 km around the sources.
- Cartesian 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 in 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 of proposed activity.
- Stability class was evaluated based on wind direction fluctuation.
- The mathematical equations used for the dispersion modelling assumes that the earth surface acts as a perfect reflector of plume and physico-chemical processes such as dry and wet deposition and chemical transformation of pollutants are negligible.
- Washout by rain is not considered.
- Source of emission is continuous and at steady state.

Sources of Pollution/Emission

1. Active Mining Area: 100m x 100m (**Area Source**)
2. Mine Road (**Line Source**)

4.4.4 Emission Calculation

An emissions factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. The general equation for emissions estimation is:

$$E = A \times EF \times (1 - ER/100)$$

Where;

E = emissions in (gm/sec);

A = activity rate (Tonnes/Hr);

EF = emission factor (Kg/Tonnes), and

ER = Overall emission reduction efficiency, %

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Emission rate of pollutants from operation of mining is calculated based on the emission factors given in the AP-42 published by USEPA. As per the emission factors published in the above documents, the emission rate has been computed and is provided below.

Table No.:4- 1: Emission Source Details

Sr. No.	Emission Source Details	Value
1	Average Wind Velocity, m/s	3.4
2	Moisture Content, %	20
	Mineral Excavation	
1	Production capacity of the mine, TPA	939600
2	Operational hours (Working Days x Working Hours, 240x8)	1920
3	Activity rate, TPH	489.375
4	USEPA emission factor (EF), kg/MT	3.9261E-05
5	Emission rate (A*EF*1000/3600), g/s	0.005337039
6	Area of activity, m ²	10000
7	Uncontrolled emission rate, g/m ² /s	5.33704E-07
8	Controlled (90%)emission rate, g/m ² /s, a	5.33704E-08
	Mineral Loading	
1	USEPA emission factor (EF), kg/MT	0.00015
2	Emission rate,g/s	0.020390625
3	Area of activity, m ²	10000
4	Uncontrolled emission rate, g/m ² /s	2.03906E-06
5	Controlled (90%)emission rate, g/m ² /s, b	2.03906E-07
	Overall Emission Factor, g/m²/s (a+b)	2.57277E-07
	Haulage Emission	
1	Surface Silt Content, % by Wt	3
2	Gross Vehicle Weight, Tonnes	30
3	Truck Capacity, MT	12
4	No of Trips /Yr	78300
5	Lead Length/Trip, KM (To & Fro)	20
6	Emission factor, kg/VKmT	0.357526481
7	Total VKT/yr	1566000
8	Emission in Kg/Year	559886.4699
9	Emission in g/s	17.75388349
10	Uncontrolled Emission g/s/m ² (considering road width 10 m)	8.87694E-05
11	Controlled Emission g/s/m² considering 99% suppression due to water sprinkling	8.87694E-07

4.4.5 Quantitative estimation of impacts on air environment

An attempt has been made to predict the incremental rise of various ground level concentrations (GLCs) above the baseline status in respect of air pollution due to mining operations. The mathematical model used for predictions in the study is USEPA approved AERMOD View 10.0.1 software which is designed for point source, line source and area sources for the prediction of impacts due to mine operations. For estimation of the GLC in worst case scenario, the mining operations are assumed to be carried out on the flat terrain. The predicted GLC computed using AERMOD View developed by Lakes Environment model is plotted on isopleths and are shown in Figure given below.

4.4.6 Meteorological Data

The meteorological data recorded continuously during season of **Pre-Monsoon Season (March-May)** on hourly basis for wind speed, wind direction, relative humidity, precipitation, and temperature and the same is processed to extract the 24-hour mean meteorological data as per the guidelines of IMD and MoEF for application of AERMOD Version 10.0.1 model. Stability classes computed for the mean hours is based on the guidelines issued by CPCB on modelling. Mixing heights representative of the region have been taken from the available published literature.

4.4.7 Stability Classification

Wind direction fluctuation method (CPCB PROBES/70/1997-1998) is adopted for hourly stability as determined by wind direction fluctuation method as suggested by Slade(1965).

$$\sigma_{\theta} = Wdr/6$$

Wdr: the overall wind direction fluctuation or width of the wind direction in degrees, over the averaging period.

σ_{θ} : the standard deviation of wind direction fluctuation.

The stability classes are as detailed below:

Table No.:4- 2: Slades Stability Classification based Wind direction fluctuation

Stability Class	σ_θ (degree)
A (Extremely Unstable)	>22.5
B (Moderately Unstable)	22.4-17.5
C (Slightly Unstable)	17.4-12.5
D (Neutral)	12.4-7.5
E (Slightly Stable)	7.4-3.5
F (Stable)	<3.5

4.4.8 Mixing Height

As site specific mixing height were not available, mixing height based on CPCB publication, “Spatial Distribution of Hourly Mixing Depth over Indian Region”, PROBES/88/2002-03 has been considered for model to establish the worst-case scenario.

4.4.9 Monthly Wind Speed and Wind Direction

The weather is one of the main factors affecting the air quality. Weather can help to clear a way pollutants from atmosphere to improve air quality, or it can make air pollution extremely worse by helping to form highly polluted regions. The concentration of air pollutants in ambient air is governed by the meteorological parameters such as atmospheric wind speed, wind direction, relative humidity, and temperature. Rainfall can effectively remove atmospheric particulate pollutants, and the removal rate of PM₁₀ is greater than the removal rate of PM_{2.5}. In general wind speed more than 7 m/s can lift dust. Heavier particles will settle near the source area, with the smaller ones settling farther away. The site-specific weather data has been collected by installation of weather monitoring station at site.

Table No.:4- 3: Weather Monitoring Data of the Site

	March	April	May
Avg. Temperature °C (°F)	25.9 °C (78.6) °F	31.3 °C (88.4) °F	33 °C (91.5) °F
Min. Temperature °C (°F)	18.1 °C (64.7) °F	23.5 °C (74.3) °F	26.6 °C (79.8) °F
Max. Temperature °C (°F)	33.2 °C (91.7) °F	38.6 °C (101.5) °F	39.3 °C (102.7) °F
Precipitation / Rainfall mm (in)	10 (0)	9 (0)	27 (1)

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Humidity(%)	38%	29%	41%
Rainy days (d)	2	2	4
avg. Sun hours (hours)	10.7	11.4	11.6

Source: - <https://en.climate-data.org/asia/india/bihar/Gaya-4748/>

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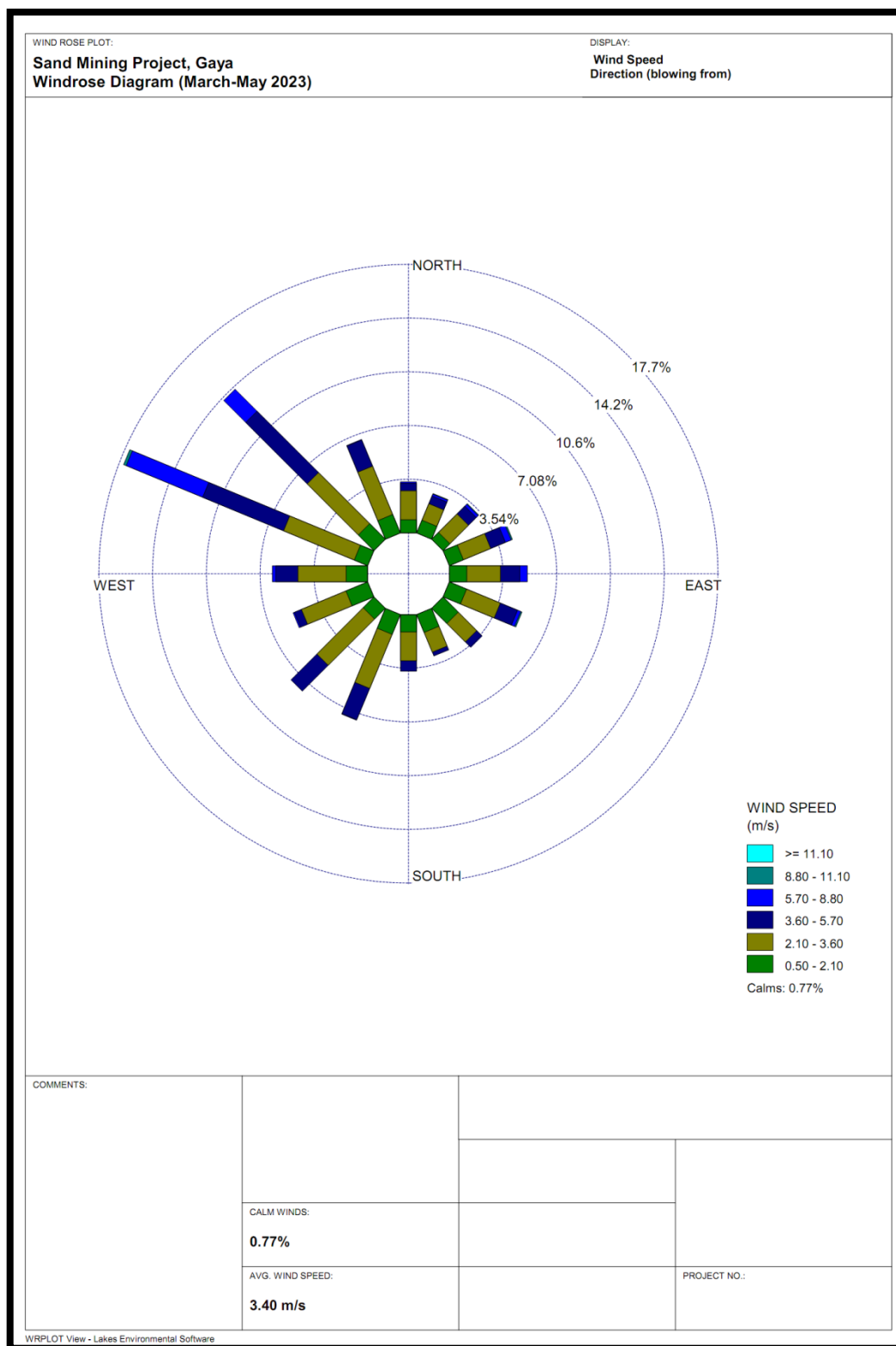


Figure 4- 1: Windrose Data of the Site

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4.4.10 Model Results

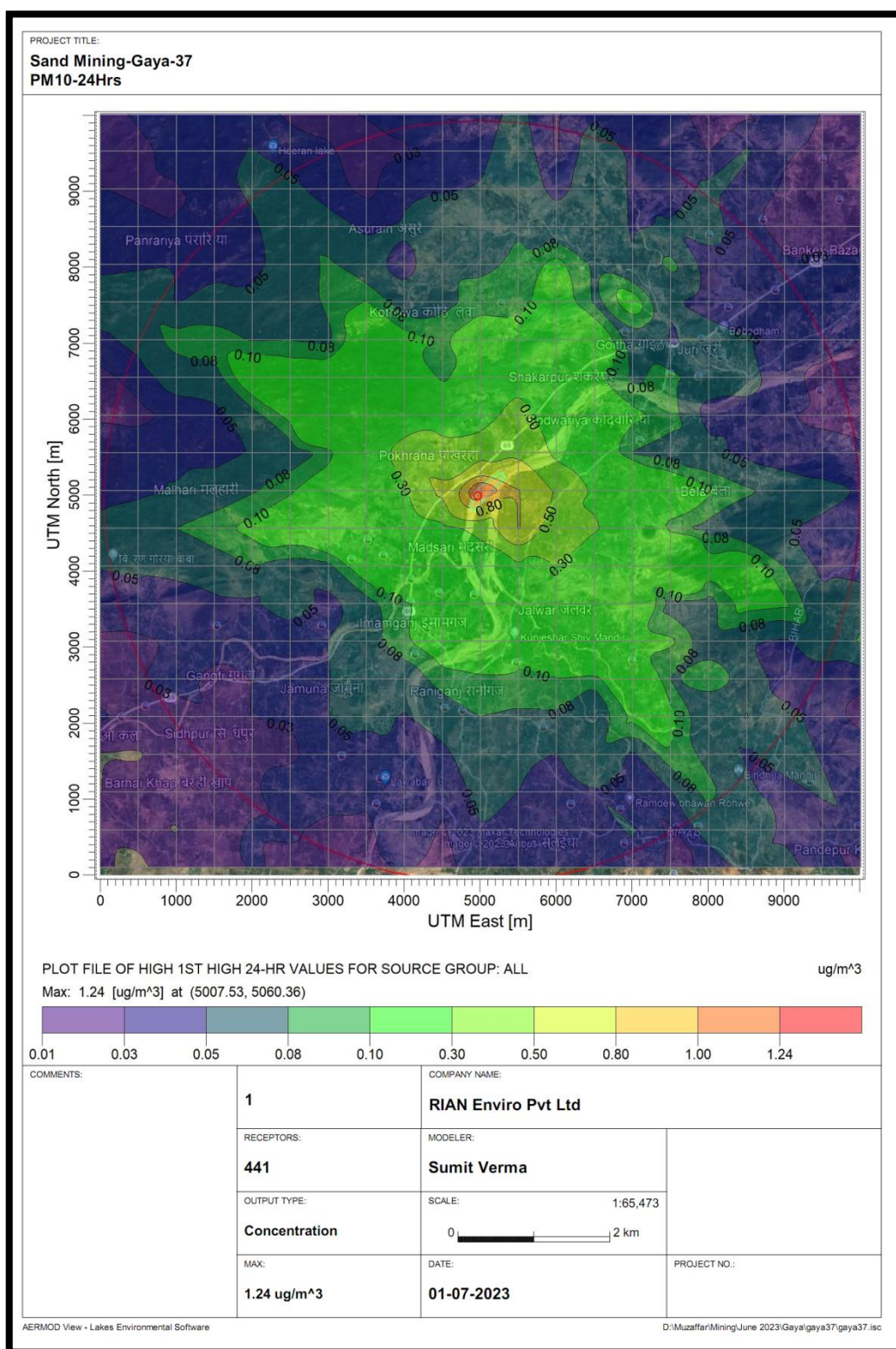


Figure 4- 2: Predicted GLC concentration of PM10

4.4.11 Mitigation measures

The collection and lifting of minerals will be done by loaders. Therefore, the dust generated is likely to be insignificant as there will be no drilling & blasting. The only air pollution sources are the road transport network of the trucks. The mitigation measures like the following will be resorted:

- ✓ Water sprinkling will be done on the haul roads twice in a day. This will reduce dust emission further by 74%.
- ✓ Speed limits will be enforced to reduce airborne fugitive dust from vehicular traffic.
- ✓ Spillage from the trucks will be prevented by covering tarpaulin over the trucks.
- ✓ Deploying PUC certified vehicles to reduce their emissions.
- ✓ Proper tuning of vehicles to keep the gas emissions under check.
- ✓ Monitoring to ensure compliance with emission limits would be carried out during operation.

4.5 Noise Environment

The proposed mining activity is semi-mechanized in nature. No drilling & blasting is envisaged for the mining activity. Hence, the only impact is anticipated is due to movement of vehicles deployed for transportation of minerals.

4.5.1 Anticipated Impacts

- Mental disturbance, stress & impaired hearing.
- Decrease in speech reception & communication.
- Distraction and diminished concentration affecting job performance efficiency.

The noise level in the working environment is 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 No.:4- 4: Damage risk criteria for hearing loss OSHA regulations

Maximum allowable duration per day in hour	Sound pressure dB(A)	Remarks
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(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.
6.0	92	
4.0	95	
3.0	97	
2.0	100	
1 ½	102	
1	105	
¾	107	
½	110	
¼	115	2. No exposure in excess of 115 dB(A) is permissible.

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.

a. Mitigation measures

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

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

4.6 Biological Environment

Mining which leads to the removal of channel substrate, re-suspension of streambed sediment and stockpiling on the streambed, will have ecological impacts. These impacts may have an effect on the direct loss of stream reserve habitat, disturbances of species attached to

streambed deposits, reduced light penetration, reduced primary production, and reduced feeding opportunities. Sand mining generates additional traffic, which negatively impairs the environment.

4.6.1 Anticipated Impacts

a) Flora

The proposed project of river bed sand mining shall be carried out on the riverbed of Morhar River. There are no trees in the project area. The project shall also not lead to any change in landuse and will be replenished every year after successive rains. The proposed mining activity, which although is an economically gainful activity, also constitutes river training work. It allows for necessary dredging activity which may otherwise lead to flooding of the valley.

There shall be negligible air emissions or effluents from the project site during loading of the truck. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly.

b) Fauna

Animals are sensitive to noise and avoid human territory. The project stretch of the river is not an identified drinking water point for the animals. However, any animal desirous of accessing the river can continue to do so upstream or downstream of the stretch during the mining activities, as there will not be any damming or diverting of water. Hence, no significant impact is anticipated from the proposed project.

4.6.2 Mitigation measures

As the proposed mining will be carried out in a scientific manner, not much significant impact is anticipated, however, the following mitigation measures will be taken to further minimize it:

a) Flora

Although, the project will not lead to any tree cutting, plantation activities shall be undertaken to improve the vegetation cover of the area. To avoid dust emissions, the mined materials will be covered with tarpaulin during transportation.

The list of plants proposed for green belt is as follows.

Table No.:4- 5: List of Trees proposed for Greenbelt (Evergreen, quick growing)

S.No.	Scientific Name	Family	Common Name	Hindi Name
1	<i>Aegle marmelos</i>	Rutaceae	Stone apple	Bael
2	<i>Azadirachta indica</i>	Meliaceae	Indian Lilac	Neem
3	<i>Alstonia scholaris</i>	Apocynaceae	Blackboard tree	Chitvan
4	<i>Cassia fistula</i>	Fabaceae	Cassia fistula Linn	Amaltas
5	<i>Callistemon</i>	Myrtaceae	Bottle brush	Cheel
6	<i>Delonix regia</i>	Fabaceae	Royal Poinciana	Gulmohar
7	<i>Ficus racemosa</i>	Moraceae	Cluster fig	Gular
8	<i>Mangifera indica</i>	Anacardiaceae	Mango Tree	Aam
9	<i>Psidium guajava</i>	Myrtaceae	Guava Tree	Amrud
10	<i>Phyllanthus emblica</i>	Phyllanthaceae	Indian gooseberry	Amla
11	<i>Putranjiva roxburghii</i>	Putranjivaceae	Putranjiva	Putijia
12	<i>Saraca asoca</i>	Fabaceae	Asoka- Tree	Ashok
13	<i>Syzgium cumini</i>	Myrtaceae	Java Plum	Jamun
14	<i>Terminalia arjuna</i>	Combretaceae	Arjun	Kahu
15	<i>Tectona grandis</i>	Lamiaceae	Teak	Sagwan

b) Fauna

The workers shall be directed to not venture out of the leased area for collecting fuel wood, or hunting. They shall also be trained not to harm any wildlife. No work shall be carried out after sunset.

4.7 Socio-Economic Environment

4.7.1 Management Plan for Socio-Economic Environment

- I. In general, socio-economic environment will have positive impact due to the mining project in the area.
- II. The deployed laborers will be from nearby villages only as these people are mainly dependent upon such mining activities.

- III. In order to further improve the socio-economic conditions of the area, the management will contribute for development works in consultation with local bodies.

4.8 Soil Environment

Movement of vehicles on the mine lease will also cause soil erosion. It is also anticipated that the garbage from the labour force and discharge of domestic wastewater will also cause the soil pollution.

- I. Wastes and debris generated at the site will be collected time to time and disposed suitably to avoid any contamination.
- II. Fuel oil for mining equipment will be stored on the cemented floor.

4.9 Solid Waste Management

Waste management is an important facet of environment management. Thus, solid waste management is important from both aesthetics and environment viewpoints. The solid waste will be generated approx. **4.5 Kg/day** on the project site.

- I. Generated food waste or any other domestic waste will be collected in dustbins and will be properly disposed of as per Solid Waste Management Rules 2016.
- II. There are no toxic elements present in the mineral which may contaminate the soil or river water.

4.10 Traffic Management

- 1. Roads will be repaired regularly and maintained in good conditions.
- 2. Haul roads will be sprinkled with water to keep the dust suppressed.
- 3. A supervisor will be appointed to regulate the traffic movement near the site.
- 4. Speed breakers or sign board will be constructed with near 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 users.

5 ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

5.1 Introduction

Consideration of alternatives to a project proposal is a requirement of EIA process. During the scoping process, alternatives to a proposal can be considered or refined, either directly or by reference to the key issues identified. A comparison of alternatives 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

Sand(minor mineral) deposits are site specific. It is present in inside river bed (29.0Ha.)The mining of the material will be done by open cast semi-mechanized method inside river bed. The mining will be done as per laid down procedures Bihar Minerals (Concession, Prevention of Illegal Mining, Transportation & Storage) Rules, 2019 (as amended in 2021.No overburden from inside riverbed block will be produced. Therefore, no alternates it is suggested as the mineral is site specific.

5.3 Alternative for Technology and other Parameters

Some alternatives considered during EIA study are discussed below:

Table No.:5- 1: Alternative for Technology and other Parameters

S. No.	Particular	Alternative Option 1	Alternative Option 2	Remarks
1.	Technology	Opencast Semi mechanized and mechanized mining.	Opencast Mechanized mining.	Opencast semi-mechanized for Riverbed is preferred Benefits: <ul style="list-style-type: none">•No electric power requirement•Minimal noise will be generated•Minimal air pollution will be generated.
2.	Employment	Local employment	Outsource employment	Local employment is preferred. Benefits: <ul style="list-style-type: none">•Provides employment to local people along with financial benefits•No residential building/housing is required.

**Draft EIA Report for Proposed Sand Mining Project at Block-37 (Gaya Morhar-24)
Sand Ghat on Morhar River, Area: 29.0 Hectares, Mauza- Babandih, Padaria, Pakri
Guriya & Chuawar, Anchal- Imamganj, District- Gaya, State- Bihar.**

3.	Laborer transportation	Public transport	Private transport	Local labors will be deployed so They will either reach mine site by Bicycle or by foot. Benefits: •Cost of transportation of men will be negligible.
4.	Material transportation	Public transport	Private transport	Material will be transported through trucks/trolleys on the contract basis Benefits: •It will give indirect employment.
5.	Water requirement	Tanker supplier	Ground water/surface water supply	Tanker supply will be preferred. Benefits: •No change in the surface water or ground water quality.
6.	Road	Haul road	Metallic road	Haul road will be considered for Linking mine site from. Minimum distance will be measured along with less number of trees for considering optimum haul road roots. Benefits: Less distance, less fuel used, minimum or negligible no. of trees will be cut in best opted haul road root.

5.4 Summary

We have analyzed all the option for alternative so the proposed mine site. This project is sand specific project and existing land use of mine lease classified as River Body which will continue to be so even after the current mining project is over, hence no alternate site is suggested for this project.

6 ENVIRONMENTAL MONITORING PROGRAM

6.1 Introduction

Regular monitoring of the various environmental parameters is necessary to evaluate the effectiveness of the management programme so that the necessary corrective measures can be taken in case there are some drawbacks in the proposed programme. Since environmental quality parameters at work zone and surrounding area are important for maintaining sound operating practices of the project in conformity with environmental regulations, the post project monitoring work forms part of Environmental Monitoring Program. Environmental Monitoring Program will be implemented once the project activity commences. Environmental Monitoring Program includes: (i) Environmental surveillance (ii) Analysis and interpretation of data (iii) Preparation of reports to support environmental management system and (iv) Organizational set up responsible for the implementation of the programme. Environmental Monitoring will be taken up for various environmental components as per conditions stipulated in Environmental Clearance Letter issued by MoEF&CC and Consent to Operate issued by the State Pollution Control Board. Compliance of same will be submitted to respective authorities on regular basis.

6.2 Environmental Management Cell

In order to maintain the environmental quality within the stipulated standards, regular monitoring of various environmental components is necessary which will be complied as per conditions. For this the lessee **Dinanath Singh** has taken decision to formulate an Environment Policy of the mine and constitute an Environmental Management Cell and committed to operate the proposed mine with the objectives mentioned in approved Environment Policy. The system of reporting of Non-conformances /violation of any Environmental Law/Policy will be as per quality management system. The internal audit will be conducted on periodic basis and any Non-conformances/violation to Environmental Law/Policy will be closed and discussed during Management Review Meetings of board of directors/partners.

6.2.1 Hierarchy

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

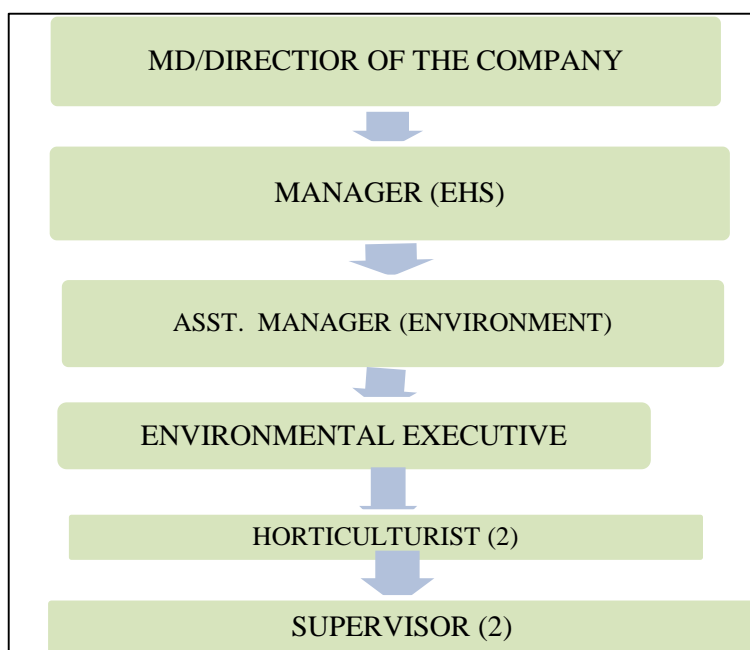


Figure 6- 1: Hierarchy of Environment System for Dealing Environmental Issues

6.2.2 Responsibilities for Environmental Management Cell (EMC)

The responsibilities of the EMC include the following:

- Environmental Monitoring of the surrounding area
- Developing the green belt/Plantation
- Ensuring minimal use of water
- Proper implementation of pollution control measures
- Access the risk area
- Implementation of QMS
- Conducting Internal Audits
- Closing of NCs and conduction Management Review Meetings.

6.3 Environmental Monitoring and Reporting Procedure

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

The key aims of environmental monitoring are:

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

6.4 Monitoring Schedule

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

Table No.:6- 1: Monitoring Schedule

S.No.	Description of Parameters	Schedule of Monitoring
1	Air Quality	24 hourly samples twice a week in each season except monsoon
2	Water Quality (Surface &Groundwater)	Once a season for 4 seasons in a year
3	Soil Quality	Once in a year in project area
4	Noise Level	Twice a year for first two years & then once a year
5	Socio-economic Condition	Once in 3 years

6	Plantation Monitoring	Once in a season
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6.4.1 Locations of Monitoring Stations

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

Table No.:6- 2: Locations of Monitoring Stations

S. No.	Description	Location
1.	Ambient Air Quality	Lease area, Villages in down Wind direction from the Lease Boundary
2.	Noise Level Monitoring	Lease Boundary, High noise generating areas within the lease boundary like joining highways, nearest village, sensitive areas in the surrounding of the mine lease.
3.	Water Level and Quality	Nearby Surface and Ground water sources
4.	Soil Quality	Lease area and Villages within study area.

Table No.:6- 3: Budget for monitoring

S. No.	Description	Cost to be incurred (In lakhs/annum)
1	Water Quality (Surface & Groundwater) Soil Quality, Air Quality, Noise Level	2.0
TOTAL		2.0

6.5 Reporting Schedule during Operation of Mine

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

6.6 Budget Allocation for Monitoring

Budget for monitoring of Air, water, Noise and Soil will be **Rs.2.0Lakh** to be incurred by the project proponent for undertaking pollution prevention measures during the mining activity.

6.7 Summary

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

7 ADDITIONAL STUDIES

7.1 General

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

7.2 Items Identified by Proponent

No requirements of additional studies have been identified due to the unique location and proposed method of mining to be adopted.

7.3 Items Identified by Regulatory Authority

All studies identified by regulatory authority have been discussed in detail in Chapter 4.

7.4 Items Identified by the Public and Other Stakeholders

The public hearing will be conducted after the draft EIA submission to the concerned authorities. The issues and items identified by the public and other stakeholders will be granted in the form of public hearing minutes, accordingly it will be included in Final EIA report.

7.5 Risk Analysis and Disaster Management Plan

All types of industries face certain types of hazards which can disrupt normal activities abruptly. Similarly, river bed mines also have risks which need to be addressed for which a disaster management plan has been formulated with an aim of taking precautionary steps to avert disasters and also take such action after disasters which limits the damage to minimum. In the sections below, the identification of various hazards, probable risks during the operational phase of the mining, maximum credible accident analysis and consequences analysis are addressed either qualitatively or quantitatively.

Risk assessments will help mine operators to identify high, medium and low risk levels. This is a requirement of the Occupational Health and Safety Act 2000. Risk assessments will help to priorities

the risks and provide information on the need to safely control the risks. In this way, mine owners and operators will be able to implement safety improvements. The following natural/industrial problem may be encountered during the mining operation.

- ✓ Inundation: Filling of the mine pit due to excessive rains
- ✓ Slope failures at the mine face so stacks
- ✓ Accident due to fire (in forested areas)

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

7.5.1 Risks due to Inundation

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

7.5.2 Risks Due to Failure of Pit Slope

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

7.5.3 Risks due to Failure of Waste Dumps

All the Material excavated during mining will be saleable, therefore no waste dumps are proposed.

7.5.4 Risks of Accidents due to Trucks and Dumpers

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

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

- ✓ Over speeding of the vehicles

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

The vehicles will be maintained in good working condition and checked thoroughly at least once a month by the competent person authorized for the purpose by the management.

- ✓ Road signs will be provided at each and every turning point up to the main road (wherever required).
- ✓ To avoid danger while reversing the vehicles especially at working place/loading points, stopper should be posted to properly guide reversing/spotting operating.
- ✓ Only trained drivers will be hired.

7.6 Disasters and Its Management

Mining and allied activities are associated with several potential hazards to both the employees and the public at large. A worker in a mine will be able to work under conditions, which are adequately safe and healthy. At the same time the environmental conditions also will not impair his working efficiency. This is possible only when there is adequate safety in mines. Hence mine safety is one of the most essential aspects of any working mine. The safety of the mine and the employees is taken care of by the Mines Act 1952, which is well defined with laid down procedure to ensure safety and constantly monitored and supervised by Directorate General of Mines Safety and Department of Mines, State Government.

7.6.1 Identification of Hazards

There are various factors, which can create disaster in sand mine. These hazards are as follows:

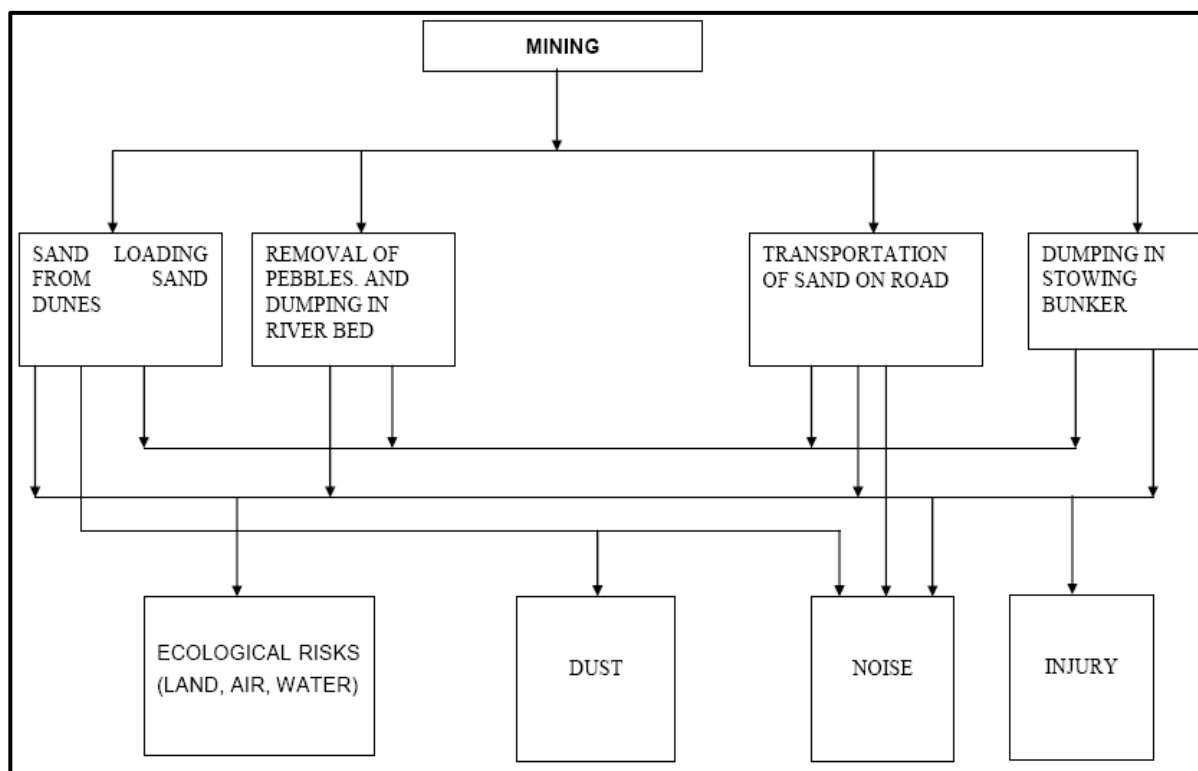
- ✓ Inundation / Flooding.
- ✓ Quick Sand Condition.
- ✓ Drowning.
- ✓ Accident due to vehicular movement.
- ✓ Accident during sand loading, transporting and dumping.

7.6.2 Sand Loading

The sand is loaded in the trucks using hand shovels and back-hoe. There are possibilities of injury in

the hands during loading with shovels and staying under bucket movement.

- ✓ There are possibilities that the workers standing on the other side of loading may get injury due to over thrown sands with pebbles.
- ✓ There are possibilities of workers getting injured during opening of side covers of the trucks to facilitate sand loading.
- ✓ There are possibilities of riverbank collapse due to close proximity of sand extraction.
- ✓ There are chances of falling of cattle/children into sand pit in river bed, may be fatal due to fall in such pits were reported from other areas to the Department of Mines.
- ✓ Chance of workers getting injured due to improper balancing of truck while loading.



7.6.3 Heavy Machinery

Most of the accidents occur during transportation by dumpers, trucks and other heavy vehicles and are often attributable to mechanical failures, in which the factor of human errors cannot be ruled out.

7.6.4 Inundation / Flooding

- ✓ The possibility of inundation/flooding of the sand mines are very high during monsoon or during heavy rains in lean season as the mine area lies over the sand dunes of a riverbed.
- ✓ There are dangers to the trucks and other machineries due to flooding.
- ✓ There are dangers to the workers working in the sand dunes. Inundation or flooding is expected and beneficial for these sand mines as during this time only the sand reserve gets replenished.

7.6.5 Safety Features Required in Tippers/Trucks

- ✓ **Rear Vision System:** For assisting operator to have back view during reversing.
- ✓ **Auto dipping System:** To reduce glaring of eyes of operator during night.
- ✓ **Load Indicator and Recorder:** Enables management to detect and prevent over loading.
- ✓ **Global Positioning system:** To prevent illegal transport and selling of sand, restricting short-cut routes other than stipulated routes and computerized monitoring.
- ✓ **Seat belt reminder:** To alert operator for using the seat belt.

7.6.6 Mitigation of Hazards

7.6.6.1 Measures to Prevent Accidents during Sand Loading.

- ✓ The trucks will be brought to a level so that the sand loading operation suits to the ergonomic Condition of the workers and the back-hoe.
- ✓ The loading will be done from one side of the truck only.
- ✓ The workers will be provided with gloves and safety shoes during loading.
- ✓ Opening of the side covers (pattas) will be done carefully and with warning to prevent injury to the loaders.
- ✓ No sand will be collected within 7.5m from bank, especially from outer bank of the meandering river. Safe clearance will be mainly determined by the height of the river bank and thickness of sand to be extracted from the close vicinity of that bank.
- ✓ Ponding in the river bed shall not be allowed.
- ✓ Operations during daylight only.
- ✓ No foreign material (garbage's) will be allowed to remain/spill in river bed and catchment area, or no pits/pockets are allowed to be filled with such material.
- ✓ Stockpiling of harvested sand on the river bank will be avoided.

- ✓ For particular operations, approaching river bed from both the banks will be avoided.

7.7 Replenishment of Sand Deposits

The replenishment study has been carried out during the preparation of DSR by Sub Divisional Committee, Aurangabad after analyzing datasets of consecutive calendar years. Both field-based surveys coupled with satellite imagery study and empirical study were carried out to determine the rate of replenishment in each river of the district. The determined values of various methods as adopted for replenishment study gives a comparable value and in all cases the values are found to be much more as compared to the capping limit (60%) as suggested in the Enforcement & Monitoring Guidelines for Sand Mining (EMGSM) January 2020, Issued by Ministry of Environment, Forest and Climate Change (MoEF & CC) 2020. It is suggested to have a periodical review along with field data acquisition during pre and post monsoon periods to record the seasonal variance of the sedimentation rate on annual basis and update this DSR in case of any abnormal findings.

Replenishment rate of Gaya district has been observed that the replenished quantity of sand is found more than the extraction. In 2019 the replenished quantity is found approx. 107 % and in year 2020, it was found approx. 112%.

(Source Approved DSR, Gaya)

7.8 Social Impact Assessment, Rehabilitation & Resettlement (R&R) Action Plan

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

7.8.1 Impact on Demographic Composition

The proposed project will hardly make any difference in the demographic composition of the study area as the additional employment is envisages to create that will be met locally 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 the study area including that of sex ratio, when the mine starts operating.

7.8.2 Employment Opportunities

The proposed project will provide employment to the local people. It has been 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 opportunities to the local people.

7.8.3 Increased Supply of Sand in the Market

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

7.8.4 Impact on Agriculture

The entire mining area is part of river bed and the entire land is Government Revenue Land. It is a non-forest land and the proposed activity is to take place in the bed of river Son & agriculture field. There will be no negative impact on agriculture because compensation will be made to the land owners and agriculture land is reclaimed & give back to the land owners after the completion of mining contract so that they will again use the field for cultivation. Scientific mining will be adopted in the proposed mining project the area will be free from annual floods, which destroy standing crops, land and property. This is a positive impact of the proposed mining project.

7.8.5 Impact on Road Development

Movement of tractor-trolleys and other vehicles to and from the mining site is expected to increase substantially, when mining will start. The existing roads connecting the quarry with the National and State Highways are mostly narrow mud roads. There will be mud slide and traffic bottle neck if these roads are not widened and their conditions are not improved. Hence, there is good scope for road development in the mining area. Further, there are risks of accidents during loading of extracted minerals into tractor-trolleys and transportation to markets for sell. However, accidents can be avoided by taking due care & precautions.

7.8.6 Income to Government

The proposed mining activity will benefit the State in the form of royalty, dead rent, fees & earning from taxes.

7.8.7 Impact on Law and Order

As most of the workers to be employed in the proposed mining project are local residents no law & order problem is envisaged. It is expected that the workers will attend to their duties from their residence and return to their homes after the day's work. There would have been law & order

problem if the workers were migrants and lived in shanties closed to the mining area. However, to meet any untoward incident one police post may be set up closed to the mining area.

7.8.8 Impact on Health

There are no chances of occurring diseases, due to manual mining of sand. Sand is non-toxic. However, sand mining activities such as excavation and loading unloading of sand 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.

Rehabilitation and Resettlement (R&R) action plan is not applicable for this project.

7.9 Summary

Risk assessments will help to priorities the risks and provide information on the need to safely control the risks. In this way, mine owners and operators will be able to implement safety improvements. Mining and allied activities are associated with several potential hazards to both the employees and the public at large. A worker in amine will be able to work under conditions, which are adequately safe and healthy. At the same time the environmental conditions also will not impair his working efficiency. This is possible only when their inadequate safety in mines. Hence mine safety is one of the most essential aspects of any working mine. It is very important to conserve the scheduled fauna in the area by the local authority as well as by the forest officials. People are not aware about the wildlife and protection of wild animals. There is an urgent need of education and awareness to local people about the wild life and their importance. A green belt will be developed around the core zone. Green belt plantation will be started with the beginning of the mining and will be completed at the end of mine lease. This mining project has positive impact on social and economic well-being of the community because this project provides employment opportunities to local people and many social welfares works done by project proponent. There is no displacement of the population within the project area and adjacent nearby area.

8 PROJECT BENEFITS

8.1 General

The proposed sand mining project will improve the socio-economic and reduce the chances of flood. This will be in form of roads, water supply, employment and economic growth.

8.2 Physical benefits

- ✓ Generate useful economic resource for construction.
- ✓ Improve Socio-economic conditions of surrounding areas.
- ✓ Protecting river banks.
- ✓ Reduce the probability of submergence of adjoining agricultural lands.
- ✓ Protection of crops being cultivated along the river bank.
- ✓ Reducing aggradations of river level.
- ✓ **Improvements in the physical infrastructure:** -The Proposed Sand mine will have numerous induced impacts on society such as growth in schools, hospitals, hotels & restaurants, transport etc.
- ✓ **Improvements in the social infrastructure:** -The social infrastructure like repairing of handpumps, submersibles for agriculture, maintenance of nearby school infrastructure and maintenance of haulage path and village roads.
- ✓ **Employment potential** -- The present project will provide employment to **30** people.
- ✓ **Other tangible benefits:** -Deepening and cleaning of the river flood plain/bed will help in reduction of flood in the area, job opportunity to the labours. The CER activity will add aid to educational infrastructure, maintenance of the village road and also health check -up of the nearby villagers.

8.3 Social Benefits

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

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

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

8.4 Corporate Environmental Responsibilities

As per MoEFCC OM dated 30th September 2020 adequate funds shall be earmarked as per the commitments made by project proponent and requirements to address the issues raised during the public hearing in lieu of corporate Environment Responsibility (CER) and this will be covered under EMP. Detailed action plan for the activities along with the budgetary allocation will be incorporated in this EIA/EMP Report upon completion of public hearing.

8.5 Ecological Benefits

A green belt will be developed along the boundary of the mining lease area. The area for green belt plantation consists of undisturbed soil; hence plantation could be made as in any garden or road side plantation. Green belt is erected not from biodiversity conservation point of view but is basically developed as a screen to check the spread of dust pollution. It is proposed to plant **290** Nos. of **native species** along with some fruit bearing and medicinal trees during the plan period and a budget of capital Cost **Rs7.05Lakh** and recurring Cost. **10.44 Lakhs** for plantation is given in **EMP**.

8.6 Conclusion

The management will recruit the semi-skilled and unskilled workers from the nearby villages. The project activity and the management will definitely support the local Panchayat and provide other form of assistance for the development of public amenities in this region. The company management will contribute to the local schools, dispensaries for the welfare of the villagers. A suitable combination of trees that can grow fast and also have good leaf cover will be adopted to develop the green belt. It is proposed to plant **290** Nos. native species per during the mining plan period.

9 ENVIRONMENTAL COST BENEFIT ANALYSIS

9.1 Environmental Cost Benefit Analysis

As per EIA Notification dated 14th September, 2006 as amended from time to time; the chapter on “Environmental Cost Benefit Analysis” is applicable only, if the same is recommended at the Scoping Stage.

As per the ToR points issued on dated 09-06-2023 by SEIAA Bihar, (File No. SIA/1(a)/2435/2023) the Environmental Cost Benefit Analysis is not required.

10 ENVIRONMENT MANAGEMENT PLAN

10.1 General

Environmental Management Plan is a guiding document for environmental impacts associated with the proposed projects. It is a guiding document for management of good environmental condition on the site & surrounding of the proposed sand mine. The Environmental Management Plan (EMP) has been formulated and integrated with the sand mine planning keeping in view overall scientific development of local habitat and reduce the adverse impact that may be caused due to the sand mining operation. A scientific assessment of these impacts those are likely to influence the existing environmental scenario is needed. This could also facilitate in formulating a suitable environmental management plan depicting all mitigation measures. It can help in implementing the project in an eco-friendly manner. The project activities influencing the following environmental attributes have been studied and their impacts on the following attributes have been assessed.

The Environment Management Plan (EMP) will outline the measures that will be undertaken to ensure compliance with environmental legislation and recommendations from the EAC / SEAC to minimize adverse impacts on the environment. The environmental management plan consists of the set of mitigation, management, monitoring and institutional measures to be taken during the implementation and operation of the project, to eliminate adverse environmental impacts or reduce them to acceptable levels. The present environmental management plan addresses the components of environment, which are likely to be affected by the different operations in a mine area. The environmental management must be integrated into the process of mine planning so that ecological balance of the area is maintained and adverse effects are minimized. An Environmental Management Plan (EMP) is a site-specific plan developed to ensure that the project is implemented in an environmentally sustainable manner. An effective EMP ensures the application of best practice environment management to a project the purpose of an EMP is to:

- I. Assists proponent in the preparation of an effective and user-friendly EMP.
- II. Improve the contribution that an EMP can make to the effectiveness of the environmental management process.
- III. Ensure a minimum standard and consistent approach to the preparation of EMP's.

- IV. Ensure that the commitments made as part of the project's EIA are implemented throughout the project life.
- V. Ensure that environment management details are captured and documented at all stages of a project.

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

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

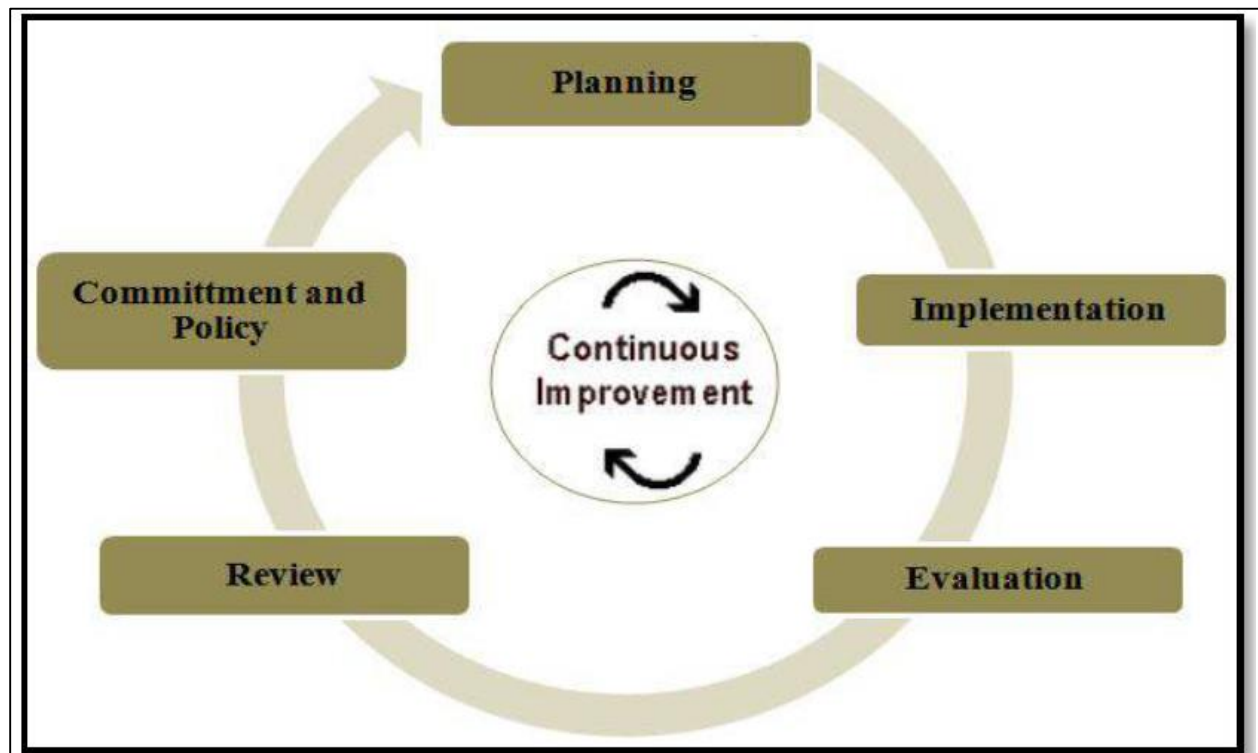


Figure 10- 1: Flow Chart of EMP

10.2 Land Use Pattern

River bed mining can lead to river bank erosion and sedimentation arising from changes in hydrology due to alteration in water depths and river bed morphology. Sand and gravel in lowland river landforms are biologically important and an economic asset. Keeping this in mind, the following management plans are suggested:

- I. Mineral will be mined out after leaving sufficient safety zone from the bank as per sand Enforcement & Monitoring Guidelines for Sand Mining 2020.
- II. The mining is planned in non-monsoon seasons only, so that the excavated area gets replenished during the monsoon each year.
- III. Pits will get replenished naturally every year after monsoon.
- IV. Grass/plants will be planted on the bank of the river for their stability.

10.3 Air Environment Management

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

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

10.3.1 Control of Gaseous Pollution

In mining activities, the only source of gaseous emissions is from the engines of transport vehicles. The emissions from the diesel engines of the machinery can be controlled by proper maintenance and monitoring of machines.

10.3.2 Control of Dust Pollution

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

a) During loading operation

- I. Latest loading equipment like hydraulic excavators will be used with dumpers. This reduces the number of buckets to fill from height and thus have comparatively less dust generation. The propagation of this dust is confined to loading point only and does not affect any person both the operators of excavator and dumpers who will sit in closed chamber and will be equipped with dust mask.
- II. Skilled operators will operate excavators.
- III. Avoid overloading of dumpers and consequent spillage on the roads.

b) During Transport operation

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

c) Plantation work carried out

In order to reduce air pollution in the surroundings, green belt will be developed along mine approach road. The plantation will be done along the bank of a river.

d) Monitoring of air pollution

Periodic air quality survey will be carried out to monitor the changes consequent upon mining activities as per the norms of CPCB.

10.4 Noise and Vibration Environment

The ambient noise level monitoring carried out in and around the proposed mine lease area shows that ambient noise levels are well within the stipulated limits of MoEF&CC. There is no drilling and blasting for mineral extraction. Noise pollution will only be due to loading and transporting equipment. Effective steps will be taken to keep the noise level well below the limit of 85 db A as prescribed by DGMS.

10.4.1 Noise Abatement and Control

- I. Proper maintenance of all machines is being carried out, which help in reducing generation of noise during operations.
- II. No other equipment's except the Transportation vehicles and Excavator and Loaders (as and when required) for loading is allowed.
- III. Noise generated by this equipment is intermittent and does not cause much adverse impact.
- IV. Periodical monitoring of noise will be done to adopt corrective actions wherever needed.
- V. Plantation will be taken up along the approach roads. The plantation minimizes propagation of noise and also arrests dust.
- VI. Mining will be done on day time only.

10.5 Surface and Ground Water Management

During the operational phase of mine no waste water or industrial effluent will be generated. The environmental management for water pollution control includes:

- I. Mining will neither intersect the ground water table of the area. So not at all disturbing water environment.
- II. The mining does not have any impact on topography and natural drainage of surrounding area.
- III. Local people will be employed and no permanent housing will be done so no permanent drainage pattern for sewerage system is required as domestic sewage shall be disposed of into septic tank followed by soak pits.

- IV. Monitoring of water quality of nearby surface water, ground water and domestic water will be conducted once in every season except monsoon to evaluate the performance of the mitigation measures.

10.5.1 Waste Water Management

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

10.5.2 Water Conservation

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

10.6 Solid Waste Management

Waste management is an important facet of environment management. Thus, solid waste management is important from both aesthetics and environment viewpoints.

- III. Generated food waste or any other domestic waste will be collected in dustbins and will be properly disposed of.
- IV. There are no toxic elements present in the mineral which may contaminate the soil or river water.

10.7 Green Belt Development

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

10.7.1 Plantation Program

Under the afforestation plan, plantation in nearby villages and connecting roads will be undertaken. The implementation for development of greenbelt will be of paramount importance as it will not only add up as an aesthetic feature but will also act as a pollution sink. The species to be grown in the areas will be dust tolerant and fast-growing species so that a permanent greenbelt is created. Plantation in the barrier zone and roads is necessary as these areas will contain fine particulates resulting from mining operation and vehicle movement. Mining activities will not cause any harm to riparian vegetation cover as the working will not extend beyond the offset left against the banks in the river. It is proposed to have plantation on both sides of the roads as greenbelt to provide cover against dust dissemination. River banks will be strengthened by way of plantation on the banks. Plantation will also be carried out as social forestry programme in village, school and the areas allocated by the Panchayat /State authorities. Native plants and other local species will be planted. A suitable combination of trees that can grow fast and also have good leaf cover shall be adopted to develop the greenbelt. It is proposed to plant **290 numbers** of native species will be planted during the plan period. List of Species for Greenbelt Development is given in Table 10-1. Plantation will increase the water holding capacity and help in recharging of ground water. No artificial rainwater harvesting is proposed for the present project.

Table No.:10- 1: List of Species for Greenbelt Development

S.No.	Scientific Name	Family	Common Name	Hindi Name
1	<i>Aegle marmelos</i>	Rutaceae	Stone apple	Bael
2	<i>Azadirachta indica</i>	Meliaceae	Indian Lilac	Neem
3	<i>Alstonia scholaris</i>	Apocynaceae	Blackboard tree	Chitvan
4	<i>Cassia fistula</i>	Fabaceae	Cassia fistula Linn	Amaltas
5	<i>Callistemon</i>	Myrtaceae	Bottle brush	Cheel
6	<i>Delonix regia</i>	Fabaceae	Royal Poinciana	Gulmohar
7	<i>Ficus racemosa</i>	Moraceae	Cluster fig	Gular
8	<i>Mangifera indica</i>	Anacardiaceae	Mango Tree	Aam

9	<i>Psidium guajava</i>	Myrtaceae	Guava Tree	Amrud
10	<i>Phyllanthus emblica</i>	Phyllanthaceae	Indian gooseberry	Amla
11	<i>Putranjiva roxburghii</i>	Putranjivaceae	Putranjiva	Putijia
12	<i>Saraca asoca</i>	Fabaceae	Asoka- Tree	Ashok
13	<i>Syzgium cumini</i>	Myrtaceae	Java Plum	Jamun
14	<i>Terminalia arjuna</i>	Combretaceae	Arjun	Kahu
15	<i>Tectona grandis</i>	Lamiaceae	Teak	Sagwan

10.8 Socio-Economic Environment

10.8.1 Management Plan for Socio-Economic Environment

- I. In general, socio-economic environment will have positive impact due to the mining project in the area.
- II. The deployed laborers will be from nearby villages only as these people are mainly dependent upon such mining activities.
- III. In order to further improve the socio-economic conditions of the area, the management will contribute for development works in consultation with local bodies.

10.9 Occupational Health and Safety

Occupational Health and Safety professionals develop and coordinate safety and health systems and strategies within organizations. They identify workplace hazards, assess risks to employee health and safety, and recommend solutions. Increasingly, Health and Safety Professionals are also responsible for many of the environmental aspects of their workplace. As this profession matures there is an increased emphasis on risk management strategy and on the development of workplace culture.

Occupational Health and Safety professionals in the minerals industry may perform the Following tasks-

- I. The collection of minor minerals from the Sand mine does not cause any occupational ill effects.

- II. Except fugitive dust generation there is no source which can show a low probability for health-related diseases and proper dust suppression will control dust generation and dispersion.
- III. Dust masks will be provided to the workers working in the dust prone areas as additional personal protective equipment.
- IV. The occupational health hazards have so far not been reported.
- V. Awareness program will be conducted about likely occupational health hazards so as to have preventive action in place.
- VI. Any worker's health related problem will be properly addressed.
- VII. Periodical medical checkup will be conducted.
- VIII. Promote occupational health and safety within their organization and develop safer and healthier ways of working;
- IX. Help supervise the investigation of accidents and unsafe working conditions, study possible causes and recommend remedial action;
- X. Develop and implement training sessions for management, supervisors and workers on health and safety practices and legislation;
- XI. Coordinate emergency procedures, mine rescues, firefighting and first aid crews;
- XII. Communicate frequently with management to report on the status of the health and safety strategy and risk management strategy, and develop occupational health and safety strategies and systems, including policies, procedures and manuals.

Table No.:10- 2: Budget for occupational health

S. No.	Activities recommended for communities' level services	Tentative cost (Lakh Rs.)
1	Awareness campaigns regarding health issues in the nearby villages.	0.50
2	Provide free health checkups & medicines to the nearby villagers of the project site.	1.0
3	Assistance to set up a temporary health center during the lease tenure.	1.0

10.10 Cost of EMP Measures

Following provisions are proposed to be taken for improving, control and monitoring of environment protection measures.

Table No.:10- 3: Budget for EMP (Lakhs)

Sl. No	Description	Capital Cost (lakh)	Recurring Cost (lakh)
1	Pollution Control & Dust Suppression	Nil	4.0
2	Pollution Monitoring i) Air pollution ii) Water pollution iii) Noise Pollution	--	2.0
3	Plantation and salary for one gardener (part time basis).	5.8	0.5
4	Haul road Maintenance Cost	1.25	1.44
TOTAL		7.05	7.94
Budget for Occupational Health		-	2.5
Grand Total		7.05	10.44

10.11 Summary

As per Above discussion there is no measure impact on the environment due to mining except fugitive mission in the form of dust generated during handling of mineral. The adequate preventive measures will be adopted to contain the various pollutants within permissible limits. Plantation development will be carried out in the mine premises, along the approach roads, around Govt. buildings, schools approx.**290 trees** during plan period. It will prove an effective pollution mitigate technique, and help avoid soil erosion during monsoon season. Employment opportunities will be provided to the locals only as providing extraction of minerals from the mine site is the only prevailing occupation for them for their livelihood. A budget of Rs. **7.05Lakh**(Capital Cost) &**10.44Lakhs**(Recurring Cost) for EMP is incurred by Project Proponent.

11 SUMMARY & CONCLUSION

11.1 Introduction

As per MoEF&CC, New Delhi Gazette dated 14th September 2006 and amended thereof, the proposed mining project is categorized as category B-1 due to project area is more than 5.0 Ha. The LOI was granted in favor of **Dinanath Singh Add- Lasarhi, P.O- Agion, P.S.- Garhani, District- Bhojpur, State- Bihar.**, vide letter no- 5511/Khanan, Gaya dated 29-11-2022., for the period of 5 years (A copy of LOI is attached as Annexure-I.)

The Proposed Sand Mining Project at Thana No.- 314, 240, Khata No. 490,79,433,345, Khasra No.2720, 592, 2785/2835, 1 in Mauza- Babandih, Padaria, Pakri Guriya & Chuawar, Block- Imamganj, District- Gaya, Bihar. Mine Lease Area – 29.0 Ha for production of 522000 cum per annum or 939600 TPA.

Table No.:11- 1: Details of the Project

S. No.	Particulars	Details							
1.	Nature and Size of the Project	Mining of Sand Minor Minerals with Production Capacity of 522000 cum per annum or 939600 TPA(M.L. Area- 29.0ha).							
2.	Location								
	Plot/Survey/Khasra No.	River Name	Mauza	Thana No.	Khata No.	Khasra No.	Name of the Ghat	Area (Ha)	
		Morhar	Babandih	314	490	2720	Block-37 (Gaya Morhar-24)	29.0	
			Padaria	--	79	592			
			Pakri Guriya	240	433	2785/2835			
			Chuawar	--	345	1			
	Village	Mauza- Babandih, Padaria, Pakri Guriya & Chuawar							
	Block	Block- Imamganj							
	District	Gaya							
	State	Bihar							

Draft EIA Report for Proposed Sand Mining Project at Block-37 (Gaya Morhar-24) Sand Ghat on Morhar River, Area: 29.0 Hectares, Mauza- Babandih, Padaria, Pakri Guriya & Chuawar, Anchal- Imamganj, District- Gaya, State- Bihar.

3.	Geographical Coordinates Latitude and Longitude of	Block-37 (Gaya Morhar-24) Sand Ghat, Area: 29.0 Ha, Coordinates: -		
		Sl. No	Latitude	Longitude
		1	24° 29' 20.96" N	84° 36' 28.86" E
		2	24° 29' 16.89" N	84° 36' 31.34" E
		3	24° 28' 50.51" N	84° 36' 0.40" E
		4	24° 28' 54.11" N	84° 35' 55.88" E
4.	Toposheet (OSM) No.	G45S6, G45S7, G45U10 & G45U11		
5.	Lease Area Details			
	Lease Area	29.0 Ha.		
	Type of Land	River bed of Morhar		
	Topography	Undulated (Riverbed)		
	Site Elevation Range	169.5ASML to 172.6 ASML		
6.	Cost Details			
	Cost of the project	Rs.1282.8 lakhs. (Including Auction Cost)		
	Cost for EMP	7.05Lakh (Capital Cost) &10.44 Lakhs (Recurring Cost)		
7.	Environmental Settings of the area			
	Ecological Sensitive Areas (National Park, Wild Life Sanctuary, Biosphere Reserve, Reserve/ Protected Forest etc.) within 10 Km radius	There is no any Ecological Sensitive Areas (National Park, Wild Life Sanctuary, Biosphere Reserve, Reserve/ Protected Forest etc.) within 10 Km radius.		
	Nearest Town/ Major City with population	District Headquarter- Gaya, Approx 50.85 km in NE		
	Nearest Railway Station	Rafiganj Railway Station, approx. 36.2 Km towards North.		
	Nearest National/State	SH-69, Approx. 0.34 km towards NW.		

Draft EIA Report for Proposed Sand Mining Project at Block-37 (Gaya Morhar-24) Sand Ghat on Morhar River, Area: 29.0 Hectares, Mauza- Babandih, Padaria, Pakri Guriya & Chuawar, Anchal- Imamganj, District- Gaya, State- Bihar.

	Highway	
	Nearest Airport	Gaya International Airport, approx. 44.23 Km towards NE.
	Nearest Post Office	Post Office Pakri guriya, Apprx. 1.0 Km towards North.
	Medical Facilities	Bankey Bazar Hospital (PHC), TanrawaApprox. 5.19 Km towards West. Maa Bhagwati Hospital, TanrawaApprox. 6.52 km towards NE.
	Education Facilities	Primary School, Nagwan. Approx. 6.14 Km towards SSE. Vidya Public School, Pakri Guriya. Approx 0.45 km, towards North.
	Archaeological sites	There are noArchaeological sites within 10 km radius from project site.
	Seismic Zone	Zone III (IS 1893: 2002)
	Water Body	Morhar River (Riverbed)

11.2 Project Description

The proposed project Gaya Block 37 (GayaMorhar24) Ghat is for mining of Sand (Minor Mineral) by open cast semi-mechanized method in over an area of **29.0Ha**. The project site falls under seismic zone III which is a Moderate damage risk zone (MSK VII). The total geological reserve is **870000cum** and mineable reserve is **753243Cum** Mine lease area will be worked in benches and the digging depth will be restricted to 3.0 m only or before water table, whichever come fast. This will be further replenished during rainy season. Mineral Sand will be transported by trucks. The deposit is moderate to good quality sand. It is widely used in construction, buildings, bridges and other infrastructure. It is free from clay and non-sticky in nature. Total water requirement for the project is **6.17KLD**. Total man power requirement for the project is **30**.The site facilities like temporary, rest-shelter, first aid facility; drinking water facility etc. will be provided as per requirement. There is no litigation pending against this project.

11.3 Description of Environment

The generation of primary data as well as collection of secondary data and information from the site and surroundings was carried in Summer Season during 1stMarch 2023 to 31st May 2023.The EIA study is being done for the Mine Lease (core zone) and area within 10 Km distance from mine lease boundary (buffer zone), both of which together comprise the study area. Baseline environment was determined within the study area, which represents 10 km radius of the

surrounding area to the project site. This collected data was further used to identify potential impacts of the mining activity on the surrounding environment and formulate mitigation measures. Summary of the baseline data collected is detailed in Table 11.2.

Table No.:11- 2: Baseline Environmental Status

Attribute	Baseline status
Ambient Air Quality	The ambient air quality study for the monitoring stations shows that the maximum and minimum ground level concentration for PM ₁₀ is respectively 90.4 µg/m³ at NEAR PROJECT SITE, (AAQ1) and 55.1 µg/m³ at Raunsa (AAQ 6) . Whereas the maximum and minimum ground level concentration for PM _{2.5} ranges between 50.0 µg/m³ at Pokhrraha (AAQ 4) and 29.4 µg/m³ at Raunsa (AAQ6) . respectively. Similarly, for SO ₂ , the maximum and minimum ground level concentration varies between 17.2 µg/m³ and 5.9 µg/m³ for respectively Pokhrraha (AAQ 4) and Chaubar (AAQ5) stations. For NO ₂ the maximum and minimum ground level concentration varies between 39.0 µg/m³& 14.6 µg/m³ for respectively Pokhrraha (AAQ 4) and Panraria (AAQ 3) stations. For CO the maximum and minimum ground level concentration varies between 0.83 mg/m³& 0.17 mg /m³ for respectively Chaubar (AAQ5) and Bishunbigha (AAQ2) stations.
Noise Levels	Noise monitoring study reveals that the minimum & maximum noise levels at day time were recorded as 46.1 dB (A) at Panraria (NQ3) & 52.6 dB (A) at Pokhrraha and Kochia (NQ 4 and NQ 7). The minimum & maximum noise levels at night time were found to be 33.5 dB (A) at Jalwar (NQ 8) & 38.5 dB (A) at Bishunbigha (NQ 2). There are no other major noise producing sources in the study area except some domestic activities, which contributes to the local noise level of the area. Traffic movements in nearby villages also add to the ambient noise level of the area.
Water Quality	5 Groundwater samples and 4 surface water samples were analyzed and concluded that: The ground water from all sources remains suitable for drinking purposes as all the constituents are within the limits prescribed by drinking water standards by Indian Standards IS: 10500. From the Surface water analysis, the river water quality parameters are compared with BDU Criteria of CPCB. No metal contamination has been found in surface water samples. Overall, the surface water quality of river is

	meeting the Class D of DBU Criteria of CPCB for its suitability for wild life and fisheries.
Soil Quality	Samples collected from 5 identified locations indicate pH value ranging from 7.0 to 7.8 which shows that the soil is slightly alkaline in nature. Organic Matter ranges from 1.38% to 1.61% in the soil samples and, whereas the Potassium is found to be ranging from 185.8 to 281.4 mg/kg.
Ecology and Bio-diversity	There are no Ecologically Sensitive Areas present in the study area.

11.4 Anticipated Impacts and Mitigation Measures

Based on the Baseline Environment, as determined in Chapter 3, environmental impacts of the mining activity on the surrounding environment are described in following sub-sections.

11.4.1 Impact on Land Use Pattern

Presently there is no activity on the land. The project site is located on bank of river. There is no human settlement in the near vicinity of the project. Restoration of mine lease area is a natural process. There would not be cutting & felling of trees.

11.4.2 Impact on Air Quality

Information on air quality was studied and predicted that the mining activity will not affect the air quality in a significant manner. In mining operations, loading, and transportation operations may cause the deterioration in air quality. In the present case, only wet materials will be handled. The collection and lifting of minerals will be done Semi mechanized mining method shall be adopted for the mining of sand. Therefore, the dust generated is insignificant. Water sprinkling will be done in regular manner for dust suppression.

11.4.3 Impact of Noise Levels

Noise level will increase due to transportation. The project site away from the villages no major impact of the noise level will be there. Vehicle with low noise level will be preferred for the project.

11.4.4 Impact on Water Quality

More over due to small scale of mining operation using minimum machineries, dust suppression is by water spraying through water sprinkler limited to haulage road. Rainwater flowing through the exposed mine cuts would carry some sediment of soil and rock. These are found to be

nontoxic in nature and the runoff from mining area are the deposits of the river which were carried in past. Surface runoff water from mines has only high turbidity during monsoon. As discussed, the mining activity will require very less quantity of water in comparison to the recharging. Hence, it will not affect the water regime of the area.

11.4.5 Impact on Soil Quality

The soil textures a yellowish, light-colored variety of red soil. The basin land of the rivers is mostly sandy soil, and the land adjacent to the rivers is sandy loam. It is due to settling of air borne dust or due to wash off of solid particulates by surface or ground water. This may lead to change in porosity, permeability & other such physical characteristics of soil of the area.

11.4.6 Flora & Fauna

Flora

Floral environment is affected by mining activities due to:

- Air Pollution i.e. both dust & gaseous pollution
- Water pollution
- Land Pollution

Pollutant like dust, gaseous emanations, solid & liquid effluents will be minimized at the generation point itself and adequate measures will be taken to prevent their impact on environment.

ii) There is no forest in the core zone of mining lease area and its surrounding. So, there will be no deforestation due to mining.

iii) The mining lease area is devoid of vegetation. So, the greenery to be developed under green belt development programme will improve the floral environment of the area.

Fauna

There is no likelihood of any adverse impact on the faunal environment too due to mining activities.

11.4.7 Socio-Economic Profile

The social demographic profile of the area is not likely to be much affected, as there is not much displacement of people due to the project. The mining in the area will create rural employment.

The mining activity in the region has positive impact on the social economic condition of the

area by providing employment to the local inhabitants; wages paid increase the per capita income.

11.5 Analysis of Alternatives (Technology and Site)

We have analyzed all the options for alternatives of the proposed mine site. This project is a sand specific project and existing land use of mine lease classified as River Body which will continue to be so even after the current mining project is over, hence no alternate site is suggested for this project.

11.6 Environmental Monitoring Program

This chapter includes the technical aspects of monitoring the effectiveness of mitigation measures (including measurement methodologies, data analysis, reporting schedules, emergency procedures, detailed budget & procurement schedules). In order to maintain the environmental quality within the stipulated standards, regular monitoring of various environmental components is necessary which will have to be complied as per conditions. For this lessee **Dinanath Singh** taken decision to formulate an Environment Policy of the mine and constitute an Environmental Management Cell and committed to operate the proposed mine with the objectives mentioned in approved Environment Policy. EMP may also require measurement of ambient environmental quality in the vicinity of a site using ecological/biological, physical and chemical indicators. Monitoring may include socio-economic interaction, through local liaison activities or even assessment of complaints. Regular Monitoring of all the environmental parameters *viz.*, air, water, noise and soil as per the formulated program based on CPCB and MoEF&CC guidelines will be carried out every year. The location of the monitoring stations was selected on the basis of prevailing micro meteorological conditions of the area like; wind direction and wind speed, relative humidity, temperature. A budget for monitoring of Air, water, Noise and Soil will be **Rs.2.0 Lakhs** to be incurred by the project proponent for undertaking pollution prevention measures during the mining activity.

11.7 ADDITIONAL STUDIES

Risk assessments will help to prioritize the risks and provide information on the need to safely control the risks. In this way, mine owners and operators will be able to implement safety

improvements. Mining and allied activities are associated with several potential hazards to both the employees and the public at large. A worker in a mine will be able to work under conditions, which are adequately safe and healthy. At the same time the environmental conditions also will not impair his working efficiency. This is possible only when there is adequate safety in mines. Hence mine safety is one of the most essential aspects of any working mine. It is very important to conserve the scheduled fauna in the area by the local authority as well as by the forest officials. People are not aware about the wildlife and protection of wild animals. There is an urgent need of education and awareness to local people about the wild life and their importance. A green belt will be developed around the core zone. Green belt plantation will be done upto completion of plan period. This mining project has positive impact on social and economic well-being of the community because this project provides employment opportunities to local people and many social welfares works done by project proponent. There is no displacement of the population within the project area and adjacent nearby area.

11.8 Project Benefits

The management will recruit the semi-skilled and unskilled workers from the nearby villages. The project activity and the management will definitely support the local Panchayat and provide other form of assistance for the development of public amenities in this region. The company management will contribute to the local schools, dispensaries for the welfare of the villagers. A suitable combination of trees that can grow fast and also have good leaf cover will be adopted to develop the green belt. It is proposed to plant **290** Nos. of native species will be planted during the mining plan period. Other than this social development of village will be considered as per social activities. Socio-economic environment will have positive impact due to the mining project in the area. The mining activity will create employment opportunities to local communities. The project will not only improve the living standard of local people but also create an aesthetic value to the river banks where green belt will be developed.

11.9 Environment Management Plan

As per Above discussion there is no measure impact on the environment due to mining except fugitive emission in the form of dust generated during handling of mineral. The adequate preventive measures will be adopted to contain the various pollutants within permissible limits. Plantation development will be carried out in the mine premises, along the approach roads,

around Govt. buildings, schools approx. **290 trees during plan period.** It will prove an effective pollution mitigate technique, and he provided to the locals only as providing extraction of minerals from the mine site is the only prevailing occupation for them for their livelihood. A budget of **Rs7.05Lakh (Capital Cost) &10.44 Lakhs (Recurring Cost)**per year for EMP is incurred by Project Proponent.

11.9.1 Air Quality Management

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 from the trucks. Overloading will be prevented. Plantation activities along the roads will also reduce the impact of dust in the nearby villages.

11.9.2 Management for Noise Pollution

As the only impact is due to transportation of sand to the construction through village roads, emphasis will be given on the following points.

- Minimum use of Horns at 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 along the road networks.
- Care will be taken to produce minimum sound during loading.

It was found that the sand mining activity will not have any significant impact on the biological environment of the region. Since mining activity is carried out only during the day time, the movement of animals during the night will not be hindered.

11.9.3 Water Management

The deposits occur in the middle/bottom of the river. During the entire lease period, the deposit will be worked from the top surface to 3 m bgl or above ground water level, whichever comes first.

11.9.4 Soil Management

Topsoil is stored separately and used for plantation work in the mined-out area. Green belt development around the area minimizes the impact of mining on soil characteristics like its texture, chemistry & even Soil Erosion in the area.

11.9.5 Green Belt Development

The green belts will be designed to control PM 10, gaseous pollutants, noise, surface run off and soil erosion etc.

11.10 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. Only supervisor Staff will be hired from outside. 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. From the baseline study and various discussions on probable impacts of all the operational activity, it has been concluded that this project will have more positive impact and will generate the revenue and employment in the area. On the above facts and baseline study, the proposed activity is recommended for the commencement with proper mitigation measure as suggested.

12 DISCLOSURE OF CONSULTANTS ENGAGED

Declaration by Experts contributing to the Draft EIA/EMP report Draft EIA Report for Proposed Sand Mining Project of Area 29.0 Ha at Gaya Block 37 (Gaya Morhar 24) Ghat on Morhar River of District-Gaya State-Bihar.


The one season baseline data used in the report was collected in Summer Season (1st March 2023 to 31st May 2023) by our empanelled lab Enviro Tech Services.

12.1 Brief profile of REPL is as given below



Director	Mr. Manish Kumar
Name of the Consultant	Rian Enviro Pvt. Ltd.
Address	Mangal Market Patna -800014

12.2 Personnel involved in the preparation of Final EIA/EMP report are stated below








Accreditation Certificate of the Consultant Engaged:

EIA coordinator:	Date
Name: - Amir Akhtar	12/07/2023
	



Functional Area Experts:

S. No.	Functional Area	Name of the experts	Involvement Period and Task	Signature
1.	WP	Bhuwan Bhaskar (WP)	Preparation of WP input, impact assessment & mitigation measures	
2.	AP	Muzaffar Ahmad	Collected the ambient air data through secondary sources and suggested Air pollution control measures	

Draft EIA Report for Proposed Sand Mining Project at Block-37 (Gaya Morhar-24) Sand Ghat on Morhar River, Area: 29.0 Hectares, Mauza- Babandih, Padaria, Pakri Guriya & Chuawar, Anchal- Imamganj, District- Gaya, State- Bihar.

S. No.	Functional Area	Name of the experts	Involvement Period and Task	Signature
3.	LU	Debarati Ghosh	Development of landuse maps of study area using GIS / related tools, site visit for ground reality survey, finalization of landuse maps, and contribution to EIA documentation.	
4.	Geo	Mohan ShriramBhagwat	Collection of secondary data as well as drafting of report with respect to Geological Aspect.	
5.	HG		Collection of secondary data as well as drafting of report with respect to Hydro-geological condition in around the study.	
6.	SW	SumitVerma	Preparation of SW input, impact assessment & mitigation measures	
7.	AQ	Vishal Duggal (AQ)	Collected the meteorological data and AAQ data through secondary sources, predicted impacts on air quality using suitable AQ model and suggested air pollution control measures	
8.	SC	Mrs. NimishaVatsyayan	Proposing the soil management practices during construction and operation phase of project.	
9.	EB	Neha Kumari	Generating the ground truthing ecological assessment with secondary data from different departments, earmarking rare and endangered species.	
10.	SE	Manish Kumar	Collected the primary and Secondary data, livestock inventory/ impacts, identified village-wise amenities/ needs.	

**Draft EIA Report for Proposed Sand Mining Project at Block-37 (Gaya Morhar-24)
Sand Ghat on Morhar River, Area: 29.0 Hectares, Mauza- Babandih, Padaria, Pakri
Guriya & Chuawar, Anchal- Imamganj, District- Gaya, State- Bihar.**

S. No.	Functional Area	Name of the experts	Involvement Period and Task	Signature
11.	RH	KailashNath Sharma	Preparation of RH input, impact assessment & mitigation measures	
12.	HW	KailashNath Sharma	Preparation of HW input, impact assessment & mitigation measures	
13.	NV (Team Member)	Bhuwan Bhaskar	Collected the ambient noise data through secondary sources and suggested Noise pollution control measures during project	



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Certificate of Accreditation

Rian Enviro Private Limited

202 & 401, Mangal Market, Sheikhpura,
Raja Bazar, Patna, Bihar-800014

The organization is accredited as **Category-B** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations, 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 – opencast mining	1	1 (a) (i)	A
2	Thermal power plants	4	1 (d)	B
3	Metallurgical industries (ferrous & non-ferrous)	8	3 (a)	B
4	Cement plants	9	3 (b)	A
5	Synthetic organic chemicals industry	21	5 (f)	B
6	Distilleries	22	5 (g)	A
7	Highways,	34	7 (f)	A
8	Building and construction projects	38	8 (a)	B
9	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in IAAC minutes dated June 11, 2021 and supplementary assessment minutes dated December 17, 2021 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/21/1792 dated July 6, 2021. The accreditation needs to be renewed before the expiry date by Rian Enviro Private Limited, Patna following due process of assessment.

Sr. Director, NABET
Dated: February 28, 2022

Certificate No.
NABET/EIA/2124/IA 0079(Rev.01)

Valid up to
March 10, 2024

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website

Annexure –I
Letter of Intent (LOI)

जिला खनन कार्यालय, गया।

पत्रांक.../खनन, गया, दिनांक.../2022

प्रेषक,

अमरेश कुमार (पुष्प)
वरीय उप रागाहरी-राह-
प्रगारी खनिज विकास पदाधिकारी, गया।

सेवा में,

DINANATH SINGH
LASARHI, P.O.-AGION, P.S.-GARHANI
Email-dinanath9006266@gmail.com
Mobile-9006266887

विषय :- गया जिलान्तर्गत बालूखण्ड संख्या-37 (गया मोरहर-24) की आगामी पाँच वर्षों के लिए बन्दोबस्ती हेतु दिनांक-23.11.2022 को सम्पन्न ई-नीलामी में उच्चतम डाकवक्ता घोषित होने के फलस्वरूप सैद्धांतिक स्वीकृत्यादेश के संबंध में।

महाशय,

उपर्युक्त विषयक गया जिलान्तर्गत बालूखण्ड संख्या-37 (गया मोरहर-24), रकबा-29 हेक्टेयर की आगामी पाँच वर्षों के लिए बन्दोबस्ती हेतु दिनांक-23.11.2022 को सम्पन्न ई-नीलामी में आपके द्वारा निर्धारित सुरक्षित जमा राशि मो0- 7,83,00,000/- (सात करोड़ तीरासी लाख) रु0 के विरुद्ध मो0- 12,52,80,000/- (बारह करोड़ बावन लाख अस्सी हजार) रु0 की उच्चतम डाक बोली गई। फलस्वरूप आप उच्चतम/सफल डाकवक्ता घोषित हुए हैं। निविदा दस्तावेज की कंडिका-20 (i) के आलोक में आपके द्वारा नीलामी राशि की 25 प्रतिशत राशि (जमा अग्रधन राशि समायोजनोपरान्त) प्रतिभूति राशि मो0-1,17,45,000/- (एक करोड़ सत्रह लाख पैंतालीस हजार) रु0 के भुगतान का सादर दिनांक- 24.11.2022 को कार्यालय में प्रस्तुत किया गया है।

निविदा दस्तावेज की कंडिका 20(i)(ii)(iii)(iv)(v) के आलोक में जिलान्तर्गत बालूखण्ड संख्या-37 (गया मोरहर-24) के सैद्धांतिक स्वीकृति की शर्त एवं बंधेज निम्नवत् हैं :-

1. बालूखण्ड संख्या-37 (गया मोरहर-24) से संबंधित विवरणी निम्नवत् है :-

क्र.	नदी का नाम	रकबा (हेक्टेयर में)	Geo Coordinates		
			Latitude		Longitude
1	मोरहर (Non-Perennial)	29	A	24°29'20.96"N	84°36'28.86"E
			B	24°29'16.89"N	84°36'31.34"E
			C	24°28'50.51"N	84°36'0.40"E
			D	24°28'54.11"N	84°35'55.88"E
2	वन क्षेत्र से दूरी		लगभग 1.19 कि.मी.		
3	सुरक्षित क्षेत्र/वन अभ्यारण्य क्षेत्र/पक्षी अभ्यारण्य/वन्य जीव आश्रयण क्षेत्र से दूरी		लगभग 32.26 कि.मी.		
4	बालूघाट/बालूखण्ड से 500 मीटर के अन्दर खनन पट्टा क्षेत्र की स्थिति		लागू नहीं		
5	पुरातात्विक स्थल से दूरी		लागू नहीं		
6	खनन योग्य मात्रा		522000 घनमीटर		

2. भुगतान की शर्त :-

- नीलामी-राशि केवल प्रथम वर्ष के लिए बंदोबस्ती की राशि मानी जाएगी। दूसरे वर्ष और उसके अनुक्रमी वर्षों में बंदोबस्ती की राशि गत वर्ष की बंदोबस्ती राशि के 120 प्रतिशत अथवा समय-समय पर सरकार द्वारा निर्धारित निदेशों के अनुरूप होगा।
- प्रतिभूति जमा के अतिरिक्त आपको निम्नलिखित समय सारणी/भुगतान अनुसूची के अनुसार बंदोबस्ती की राशि का भुगतान करना होगा :-

2

किस्त	भुगतान की नियत तारीख
प्रथम किस्त (50%)	(क) पट्टा संविदा निष्पादन से पहले (पहले वर्ष के लिए) (ख) प्रथम वर्ष में पट्टा संविदा निष्पादन की तिथि से एक वर्ष पूरा होने के 60 दिन पूर्व और अनुक्रमिक वर्षों में इसी प्रक्रिया का पालन करते हुए जमा किया जायेगा।
द्वितीय किस्त (25%)	पट्टा संविदा निष्पादन की तिथि से 03 महीना पूरा होने से पहले।
तृतीय किस्त (25%)	पट्टा संविदा निष्पादन की तिथि से 06 महीना पूरा होने से पहले।

3. **GST का भुगतान :-** जी0एस0टी0 के रूप में प्रचलित दर के अनुसार राशि वाणिज्य कर विभाग को भुगतान करना होगा। जिला खनन कार्यालय, गया में जी0एस0टी0 भुगतान का प्रमाण प्रत्येक किस्त के साथ देना होगा।
4. **आयकर/अन्य करों का भुगतान :-** आयकर अधिनियम के तहत आयकर एवं उस पर नियमानुसार देय अधिभार का भुगतान आयकर विभाग के प्रचलित दर के अनुसार एक मुश्त करना होगा। यह राशि बंदोबस्ती राशि के प्रत्येक किस्त के साथ देय होगी। जिला खनन कार्यालय, गया द्वारा यह राशि आयकर मद में जमा करा दी जायेगी।
5. **जिला खनिज फाउण्डेशन :-** Bihar Mineral District Foundation Rules, 2018 के अनुसार बंदोबस्ती राशि की 2 प्रतिशत राशि जिला खनिज फाउण्डेशन, गया के नाम भुगतये बैंक ड्राफ्ट के माध्यम से करना होगा।
6. **वैधानिक अनापत्ति :-** बालूघाट संचालन हेतु आवश्यक समस्त वैधानिक अनापत्ति/अनुमति यथा:- खनन योजना, पर्यावरणीय स्वीकृति, जल एवं वायु सहमति आदि आपके द्वारा सैद्धांतिक स्वीकृत्यादेश (LOI) निर्गत तिथि से तीन माह की अवधि के अन्दर प्राप्त करना सुनिश्चित करेंगे। वैधानिक अनापत्ति/अनुमति प्राप्त करने के पश्चात् ही बालू खनन प्रारंभ किये जाने हेतु कार्यदेश निर्गत किया जा सकेगा। वैधानिक अनापत्ति/अनुमति निम्नानुसार है:-
 - i. **खनन योजना:-** खनन योजना प्रभावी नियमों में उल्लिखित प्रावधानों के अनुसार सफल डाकवक्ता/बंदोबस्तधारी द्वारा QCI/NABET से मान्यता प्राप्त Professional RQP से तैयार कर निदेशक, खान या विभाग द्वारा प्राधिकृत पदाधिकारी के समक्ष लेटर ऑफ इंटेन्ट निर्गत होने से 30 दिनों के अन्दर अनुमोदन के लिए प्रस्तुत करेगा। खनन योजना बनाने पर होने वाले व्यय का वहन संबंधित खनिज डाकवक्ता/बंदोबस्तधारी द्वारा किया जायेगा। साथ ही खनन योजना की जाँच हेतु समाहर्ता/विभाग अन्य ऐजेंसी चयनित कर सकेगा, जिसका निर्धारित फीस/खर्च भी बंदोबस्तधारी को ही वहन करना होगा। सफल डाकवक्ता/बंदोबस्तधारी खनन योजना के अनुसार खनन करना सुनिश्चित करेंगे।
 - ii. **पर्यावरणीय स्वीकृति:-** सफल डाकवक्ता/बंदोबस्तधारी खनन योजना अनुमोदन के 15 दिनों के अन्दर पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार के सक्षम प्राधिकार के समक्ष पर्यावरणीय स्वीकृति (EC) के लिए प्रस्ताव समर्पित करेगा। समयबद्ध रीति से पर्यावरणीय एवं अन्य वैधानिक स्वीकृति प्राप्त करना सफल डाकवक्ता की जिम्मेवारी होगी। अपेक्षित पर्यावरणीय स्वीकृति एवं अन्य आवश्यक स्वीकृति प्राप्त करने में किसी भी प्रकार की देरी के लिए सफल डाकवक्ता स्वयं जिम्मेवार होंगे एवं इस संबंध में किसी भी प्रकार की क्षतिपूर्ति के लिए कोई भी दावा मान्य नहीं होगा।
 - iii. **जल एवं वायु सहमति:-** पर्यावरणीय स्वीकृति प्राप्त करने के पश्चात सफल डाकवक्ता अधिकतम 07 (सात) दिवस के अंदर जल (प्रदूषण निवारण एवं नियंत्रण) अधिनियम, 1974 तथा वायु (प्रदूषण निवारण एवं नियंत्रण) अधिनियम, 1981 के अधीन सक्षम पदाधिकारी के समक्ष सहमति/ Consent to Establish/ Consent to Operate प्राप्त करने हेतु आवेदन प्रस्तुत करेगा।
 - iv. **खनन के लिए अनुमत मात्रा:-** खनन योजना, पर्यावरणीय स्वीकृति तथा जल (प्रदूषण निवारण एवं नियंत्रण) अधिनियम, 1974 तथा वायु (प्रदूषण निवारण एवं नियंत्रण) अधिनियम, 1981 के तहत प्राप्त सहमति में वर्णित बालू की मात्रा (इनमें से जो भी कम हो) तक ही खनन अनुमान्य

होगा। यदि अनुमोदित खनन योजना, पर्यावरणीय स्वीकृति तथा जल एवं वायु सहमति में खनन योग्य मात्रा कम किये जाने पर भी वार्षिक देय बंदोबस्ती राशि किसी स्थिति में कम नहीं की जाएगी।

- v. बिना किसी वैध कारण के पर्यावरणीय स्वीकृति, Consent to Establish/ Consent to Operate /जल एवं वायु सहमति प्राप्त नहीं कर पाते हैं या प्राप्त करने में रुचि नहीं लेते हैं तो, समाहर्ता द्वारा अग्रधन

7. बंदोबस्ती विलेख/पट्टा संविदा (डीड) निष्पादन करना :-

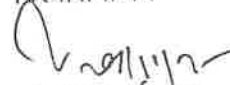
- सफल डाकवक्ता द्वारा सभी वैधानिक अनापत्ति प्राप्त करने के उपरान्त 5 वर्षों की अवधि के लिए बालू खनन करने हेतु समानुदान/बंदोबस्ती स्वीकृत किया जाएगा। सफल डाकवक्ता विहित प्रपत्र में संबंधित नियमानुसार बंदोबस्ती विलेख अथवा उसके समरूप एक प्रपत्र, कार्य आरंभ करने के पहले, निष्पादित करेगा तथा यथा विहित अपेक्षित प्रतिभूति राशि जमा देगा। बंदोबस्तधारी के पट्टे की अवधि विलेख/संविदा निष्पादन की तिथि से पाँच वर्षों के लिए विधिमान्य होगा।
- बंदोबस्तधारी को निष्पादित संविदा का निबंधन संबंधित विभाग के प्रचलित नियमों के अधीन 01 माह के अन्दर कराना अनिवार्य होगा।

8. सामान्य शर्तें :-

- बंदोबस्तधारी नदी तट से बालू प्रेषण के बिन्दु पर एक साईनबोर्ड एवं सीमा स्तंभ का अधिष्ठापन करायेगा जिसपर बंदोबस्तधारी का नाम एवं पता, बंदोबस्ती की अवधि, स्थानीय मैनेजर का नाम एवं पता तथा बालू का विक्रय मूल्य प्रदर्शित किया जाएगा। यदि साईन बोर्ड निरीक्षण में नहीं पाया गया तो शारित अधिरोपित की जाएगी।
- बंदोबस्तधारी श्रम विधियों के प्रावधानों के अनुसार आश्रय गृह, पीने का पानी, शिशु गृह (क्रेचेज) तथा फर्स्ट एड किट की व्यवस्था संबंधित बालूघाटों में लगे श्रमिकों के लिए करेगा।
- बंदोबस्तधारी संबंधित क्षेत्रों का निरीक्षण करेगा तथा स्वयं/ अथवा अपने द्वारा अधिकृत प्रतिनिधियों के माध्यम से बालूघाटों का प्रचालन करेगा। किसी रूप में किये गये उपपट्टा (सबलेटिंग) के लिए बंदोबस्ती रद्द कर दी जाएगी। बालूघाटों/नदी तल तक बालू के परिवहन के प्रयोजनार्थ पहुँच-पथ (अप्रोच रोड) का निर्माण सफल डाकवक्ता/बंदोबस्तधारी द्वारा स्वयं अपने खर्च से किया जाएगा।
- बालूघाट की सुरक्षा की जिम्मेदारी सफल डाकवक्ता/बंदोबस्तधारी की होगी।
- सफल डाकवक्ता/बंदोबस्तधारी बंदोबस्त क्षेत्र के भीतर किसी अवैध खनन के लिए जिम्मेवार होंगे और पाई गई किसी शिकायत पर गंभीरता से विचार किया जाएगा तथा बंदोबस्तधारी के विरुद्ध अपराधिक मामला दायर किया जाएगा।
- सफल डाकवक्ता/बंदोबस्तधारी समाहर्ता द्वारा बालूघाटों के संचालन के संबंध में लोकहित में जारी निर्बंधनों और शर्तों तथा निदेशों का पालन करेगा।
- यथोक्त शर्तों, बंधेजों एवं निर्बंधनों का पालन नहीं करने पर कारण पृच्छा निर्गत कर बंदोबस्ती रद्द करने की कार्रवाई की जा सकेगी।
- सफल डाकवक्ता/बंदोबस्तधारी को खनन राजस्व/जी0एस0टी0/आयकर/स्टाम्प शुल्क/रजिस्ट्रेशन फीस का भुगतान नहीं करने की दशा में 30 दिनों के अंदर कारण स्पष्ट करने हेतु नोटिस दी जायेगी। निर्धारित अवधि के अंदर सफल डाकवक्ता/बंदोबस्तधारी द्वारा बकाया का भुगतान करने में असफल रहने की दशा में राशि वसूली की कार्रवाई के साथ-साथ बंदोबस्ती रद्द करने की भी कार्रवाई की जाएगी।
- नीलामी हेतु प्रस्तावित बालूघाटों से संबंधित तकनीकी तथा अन्य बिन्दुओं यथा भूमि के अंचल, थाना, मौजा, खाता, खेसरा, रकबा तथा GPS Co-ordinate के संबंध में विवाद/त्रुटि पाए जाने पर संशोधन का अधिकार संबंधित जिला खनन कार्यालय का होगा। बालूघाटों का सीमांकन एवं नियमानुसार निर्धारित आयाम/विशिष्टियों का सीमा स्तंभ का अधिष्ठापन GPS Co-ordinate के अनुसार बालू बंदोबस्तधारी को कराना होगा तथा खनन के क्रम में संधारित कराना सफल डाकवक्ता/बंदोबस्तधारी की जवाबदेही होगी, जिसे RQP/ अंचलाधिकारी की उपस्थिति में प्रमाणित कराकर खनन कार्य कराना होगा। बालूघाटों के निर्धारित क्षेत्र का Reduced Level (RL)/Pre-Level (PL) एवं Satellite images मानसून के पूर्व एवं बाद का समर्पित करना होगा।

- (x) बालूघाट से लिफ्ट रोड और बालूघाट के बीच कोई प्राकृतिक जल मार्ग सिंचाई नहर पडती हो सफल डाकवक्ता/बन्दोबस्तधारी जल ससाधन विभाग की पूर्व अनुमति से अस्थायी संरचनाएँ खड़ा कर सकेगा। पूर्व अनुमति के लिए ऐसे आवदेन जल ससाधन विभाग के संबंधित मुख्य अभियंता के समक्ष दिए जाएंगे।
- (xi) बालूघाट में रैयती/बंदोबस्त जमीन होने पर संबंधित रैयत से सहमति प्राप्त कर बालू का खनन करना होगा। यह जिम्मेदारी पूर्णतः बंदोबस्तधारी की होगी एवं विभाग से कोई क्षतिपूर्ति का दावा मान्य नहीं होगा।
- (xii) बंदोबस्तधारी द्वारा बंदोबस्ती अवधि के दौरान किसी भी कारण से खनन कार्य नहीं करने की स्थिति में किसी भी प्रकार का मुआवजा/नुकसान एवं क्षतिपूर्ति का दावा मान्य नहीं होगा।
- (xiii) ई-नीलामी एवं बालूघाट की बंदोबस्ती अवधि के दौरान उत्पन्न किसी भी प्रकार का विवाद बिहार खनिज (समानुदान, अवैध खनन, परिवहन एवं भंडारण निवारण) नियमावली 2019, (यथा संशोधित) के अधीन होगा।
- (xiv) सफल डाकवक्ता/बन्दोबस्तधारी को इलेक्ट्रॉनिक माध्यम से भेजी गई कोई भी सूचना/निदेश /आदेश इत्यादि IT Act के तहत स्वीकार्य साक्ष्य के रूप में माना जायेगा।

विश्वासभाजन



वरीय उप समाहर्ता-सह-
प्रभारी खनिज विकास पदाधिकारी, गया।

Annexure –II
(Mine Plan Approval Letter)

बिहार सरकार
खान एवं भूतत्व विभाग।

पत्रांक— २२९० / एम०, पटना,
प्रेषक,

दिनांक— ०३/०५/२०२३

सुरेश प्रसाद,
विशेष कार्य पदाधिकारी।

सेवा में,

Email

DINANATH SINGH
LASARHI, P.O.-AGION, P.S.-GARHANI
Email-dinanath9006266@gmail.com

विषय:— **गया जिलान्तर्गत बालूखण्ड संख्या-37 (गया मोरहर-24) के खनन योजना के अनुमोदन के संबंध में।**

महाशय,

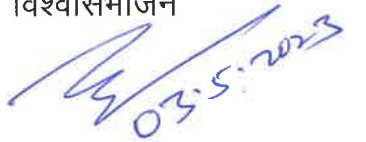
उपर्युक्त विषय के संबंध में कहना है कि बिहार बालू खनन नीति-2019 यथा संशोधित एवं बिहार खनिज (समानुदान अवैध खनन, परिवहन एवं भंडारण निवारण) नियमावली, 2019 (यथा संशोधित 2021) के नियम-17 में वर्णित प्रावधानों के तहत गया जिलान्तर्गत बालूखण्ड संख्या-37 (गया मोरहर-24) से संबंधित समर्पित खनन योजना के अनुमोदन पर प्राधिकृत समिति द्वारा समीक्षा की गई। समीक्षोपरांत निम्न शर्तों एवं बंधेजों के तहत खनन योजना अनुमोदित की जाती है —

1. उक्त खनन योजना केन्द्र सरकार/राज्य सरकार द्वारा विनियमित अन्य सभी अधिनियम/नियमावली में वर्णित प्रावधानों को तथा किसी न्यायालय/अन्य न्यायिक संस्था द्वारा पारित किये गये न्यायादेश को बिना प्रभावित किये अनुमोदित किया जा सकता है।
2. उक्त खनन योजना का अनुमोदन खान एवं खनिज (विकास एवं विनियमन) अधिनियम, 1957 (यथा संशोधित), बिहार खनिज (समानुदान अवैध खनन, परिवहन एवं भंडारण निवारण) नियमावली, 2019 के नियम-17, वन संरक्षण अधिनियम, 1980, पर्यावरण सुरक्षा अधिनियम, 1986, श्रम संबंधी नियम, EMGSM 2020 तथा अन्य सभी सुसंगत अधिनियम/नियमावली तथा उनमें वर्णित प्रावधानों के प्रतिकूल नहीं होगा। लीज के रकवा के अनुसार प्रति हेक्टेयर कम से कम 10 पौधा लगाना होगा तथा 50 प्रतिशत Survival सुनिश्चित करना होगा।
3. खनन योजना में निहित शर्तों का पालन करते हुए ही बालू खनिज का खनन तथा प्रेषण किया जायेगा।
4. संबंधित सक्षम प्राधिकार से यथा वांछित प्रमाण-पत्र प्राप्त कर विभाग को अवगत कराना अनिवार्य होगा।
5. यदि किसी भी समय खनन योजना में वर्णित शर्तों के अनुपालन में अनियमितता पायी जाती है, तो खनन पदाधिकारी को नियमानुसार आवश्यक कार्रवाई करने का अधिकार होगा।
6. संबंधित बालूघाट में खनिज की उपलब्धता, पहुँच पथ का निर्माण तथा अन्य खनन कार्यों से संबंधित सम्पूर्ण जबाबदेही बालूघाट संचालनकर्ता की होगी तथा इसमें किसी भी तरह का कोई दावा अथवा क्षतिपूर्ति मान्य नहीं होगा।
7. खनन योजना में वर्णित सभी तकनीकी तथा अन्य बिन्दुओं से संबंधित आँकड़ों की सत्यता / वैधता की जिम्मेवारी RQP/बंदोबस्तधारी की होगी तथा भविष्य में उपर्युक्त के संबंध में किसी प्रकार की भिन्नता/अनियमितता की पूरी जबाबदेही RQP/बंदोबस्तधारी की होगी।
8. खनन कार्य के दौरान घाट संचालनकर्ता द्वारा पर्यावरण संबंधी मानकों का नियमित रूप से अनुश्रवण करने की व्यवस्था करनी होगी। खनन कार्य के दौरान नदियों के प्राकृतिक बहाव आदि में किसी भी तरह का व्यवधान/रूकावट/बदलाव करना पूर्ण रूप से प्रतिबंधित होगा।

9. बालूघाट में Secondary Loading की व्यवस्था इस प्रकार सुनिश्चित की जाएगी ताकि गीला बालू का परिवहन नहीं हों।
10. यद्यपि खनन योजना में Semi-mechanised mining को प्राथमिकता दी गयी है तथापि Manual Mining पर कोई प्रतिबंध नहीं रखा जाएगा एवं स्थानीय व्यक्तियों को नियोजन देने के दृष्टिकोण से Manual Mining को उचित अवसर प्रदान करना होगा।
11. सफल डाकवक्ता/बंदोबस्तधारी द्वारा खान एवं खनिज (विकास एवं विनियमन) अधिनियम, 1957, बिहार खनिज (समानुदान अवैध खनन, परिवहन एवं भंडारण निवारण) नियमावली, 2019 (यथा संशोधित 2021) तथा बिहार बालू खनन नीति, 2019 के प्रावधानों का अनिवार्य रूप से पालन किया जायेगा।
12. सफल डाकवक्ता/बंदोबस्तधारी को पर्यावरण सुरक्षा हेतु सभी उपाय करने होंगे तथा नियमित रूप से जल/वायु की गुणवत्ता की जाँच/अनुश्रवण की व्यवस्था सुनिश्चित करनी होगी।
13. सफल डाकवक्ता/बंदोबस्तधारी को उत्पादन/प्रेषण का आँकड़ा एवं पंजी संधारित करना अनिवार्य होगा जिसे नियमित रूप से अद्यतन किया जाएगा।
14. संचालन करने वाले घाटों की सीमांकन कराना, RL/PL प्राप्त करना एवं उसे खनन के क्रम में संधारित कराना सफल डाकवक्ता/बंदोबस्तधारी की जवाबदेही होगी, जिसे RQP/अंचलाधिकारी की उपस्थिति में प्रमाणित करवाकर खनन कार्य करना होगा।
15. बिहार खनिज (समानुदान अवैध खनन, परिवहन एवं भंडारण निवारण) नियमावली, 2019 (यथा संशोधित 2021) में वर्णित प्रतिबंधित क्षेत्रों में किसी प्रकार का खनन कार्य वर्जित होगा।
16. बालूघाटों से बालू का निष्कासन एवं प्रेषण आबादी से सटे ग्रामीण सड़क को छोड़कर अलग मार्ग से करना होगा।
17. खनन योजना की एक-एक प्रति, जो संबंधित RQP द्वारा प्रत्येक पृष्ठ पर हस्ताक्षरित होगी, निदेशक, खान एवं भूतत्व विभाग के कार्यालय के अतिरिक्त समाहर्ता, गया के गोपनीय कोषांग, उपनिदेशक, मगध अंचल, गया के कार्यालय में उपलब्ध कराना सुनिश्चित किया जायेगा, ताकि किसी भी समय इसकी जाँच की जा सके।

प्राधिकृत समिति की अनुशंसा के आलोक में उपरोक्त शर्तों के साथ गया जिलान्तर्गत बालूखण्ड संख्या-37 (गया मोरहर-24) से संबंधित समर्पित खनन योजना के अन्तर्गत ही बालू उत्खनन कार्य सुनिश्चित कराया जायेगा।

विश्वासभाजन



(सुरेश प्रसाद)

विशेष कार्य पदाधिकारी



Annexure –III
Terms of Reference (ToR)

File No.SIA/1(a)/2435/2023
Government of India
State Level Environment Impact Assessment Authority
Bihar

To,

M/s DINANATH SINGH
Lasadhi, P.o- Agiaon, P.S- Garhani, District- Bhojpur,
Bhojpur-802208
Bihar

Tel.No.-; Email:dinanathlokain03@gmail.com

Sub. Terms of Reference to the Proposed Sand Mining Project of Area 29.0 Ha at Block-37 (Gaya Morhar-24) Sand Ghat on River Morhar of District-Gaya, State-Bihar., Lasadhi, P.o- Agiaon, P.S- Garhani, District- Bhojpur

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/BR/MIN/432280/2023 |
| 2. Name of the Proposal: | Proposed Sand Mining Project of Area 29.0 Ha at Block-37 (Gaya Morhar-24) Sand Ghat on River Morhar of District-Gaya, State-Bihar. |
| 3. Category of the Proposal: | Non-Coal Mining |
| 4. Project/Activity applied for: | 1(a) Mining of minerals |
| 5. Date of submission for TOR: | 05 Jun 2023 |

Date : 09-06-2023

Mr. Sudhir Kumar
(Member Secretary)

Office : **2nd Floor, Beltron B**
Phone No : Mobile : **9006266887**
Email id : **seiaa.ms.br@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 area should be provided. Such an Imagery of

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

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

- 5) Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.
- 6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.
- 7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.
- 8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.
- 9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.
- 10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
- 11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.
- 12) A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.
- 13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.

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

- 14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.
- 15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.
- 16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.
- 17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.
- 18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan alongwith budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.
- 19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered.
- 20) Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).
- 21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.

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

- 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

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

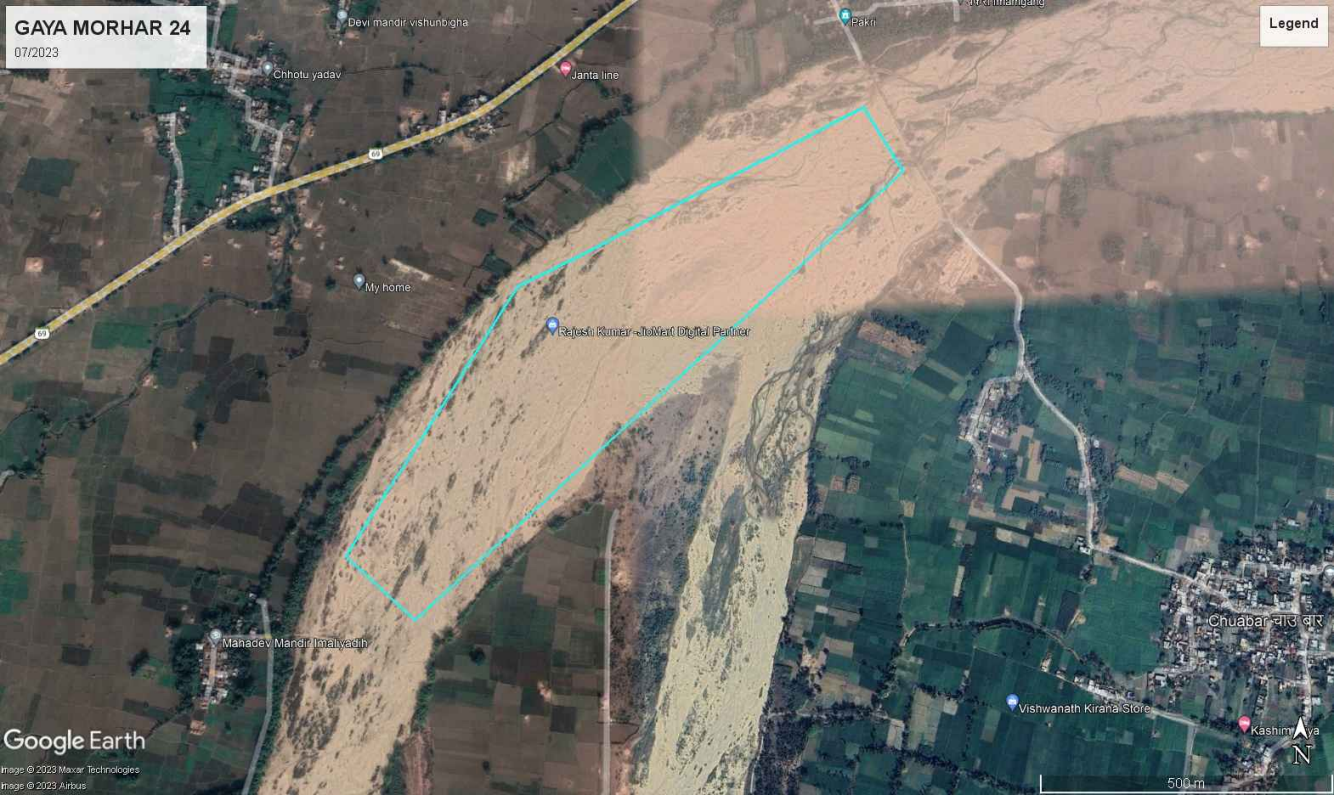
under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species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

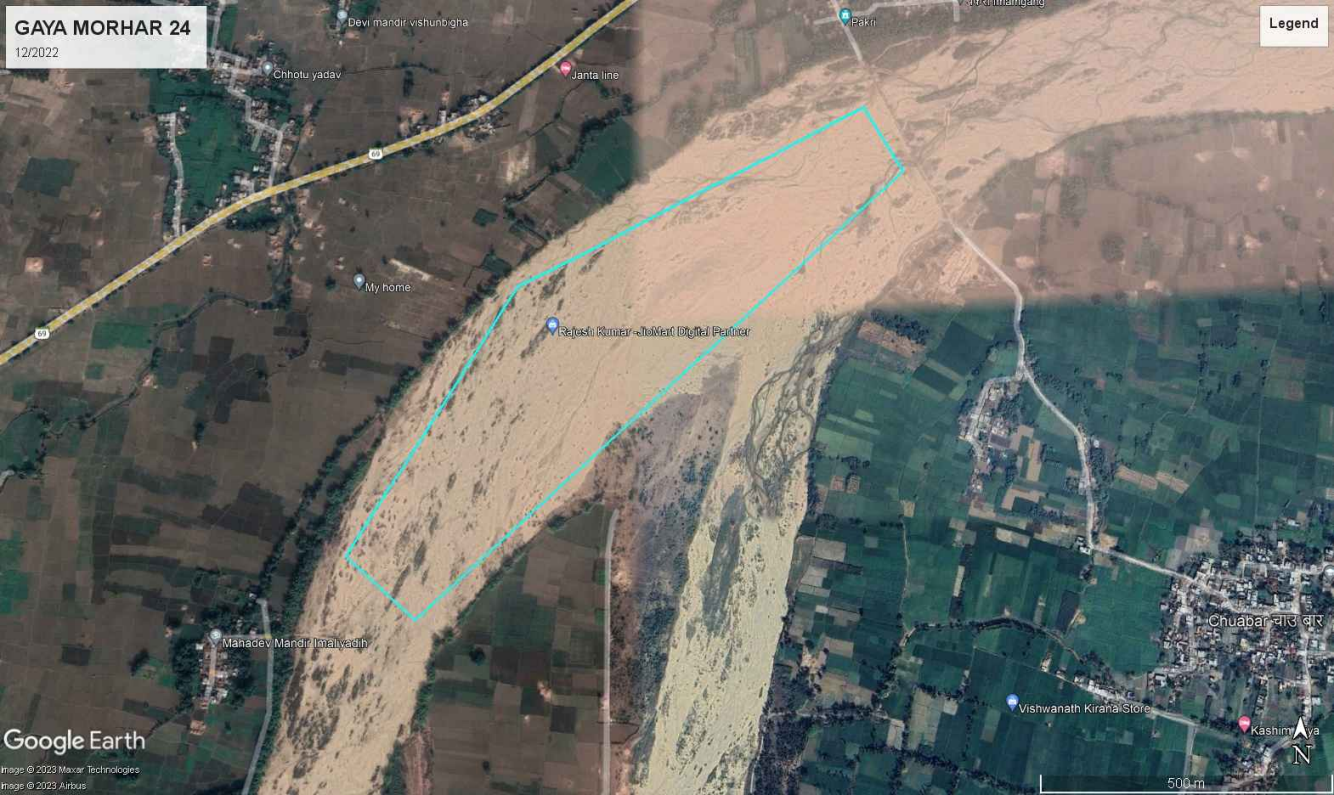
- 32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental 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.

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

- 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 –IV
(Satellite Imaginary Last 3 Years)

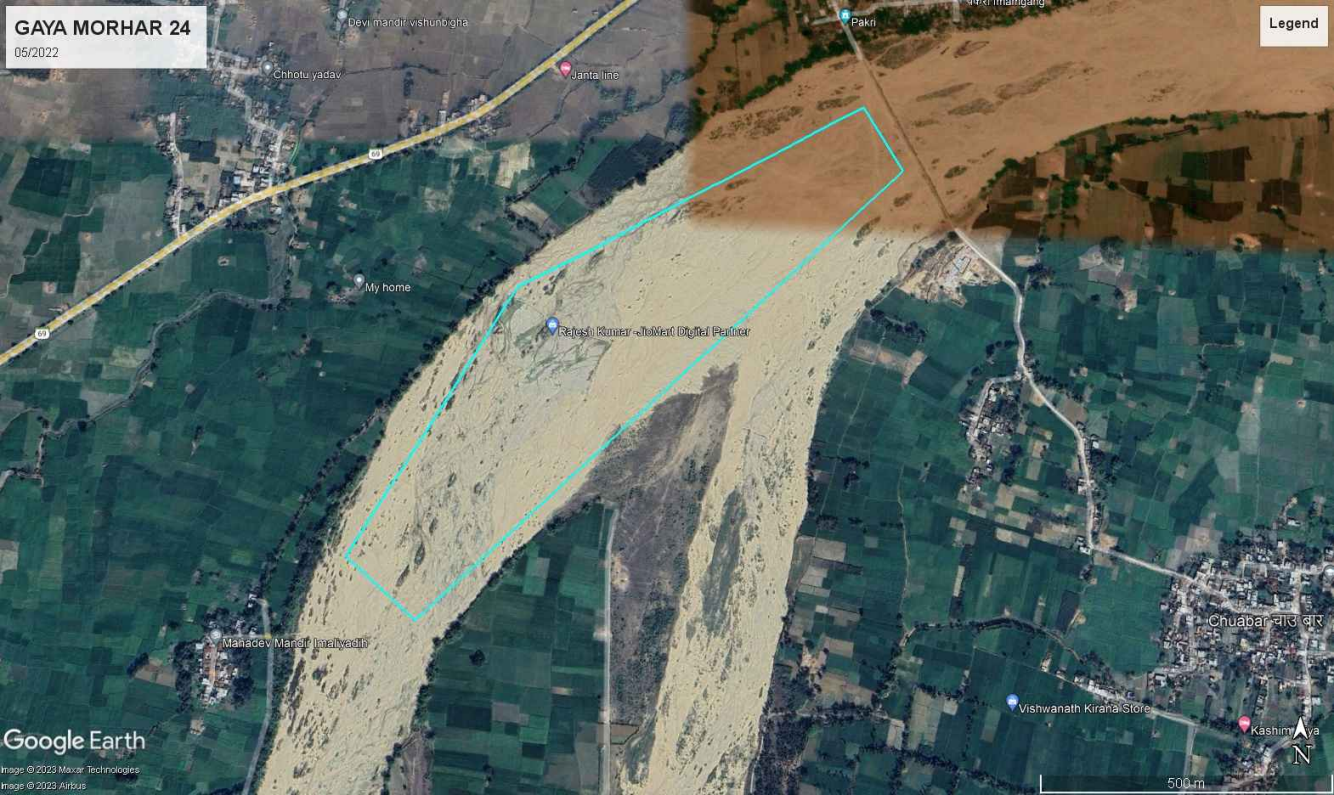




GAYA MORHAR 24

05/2022

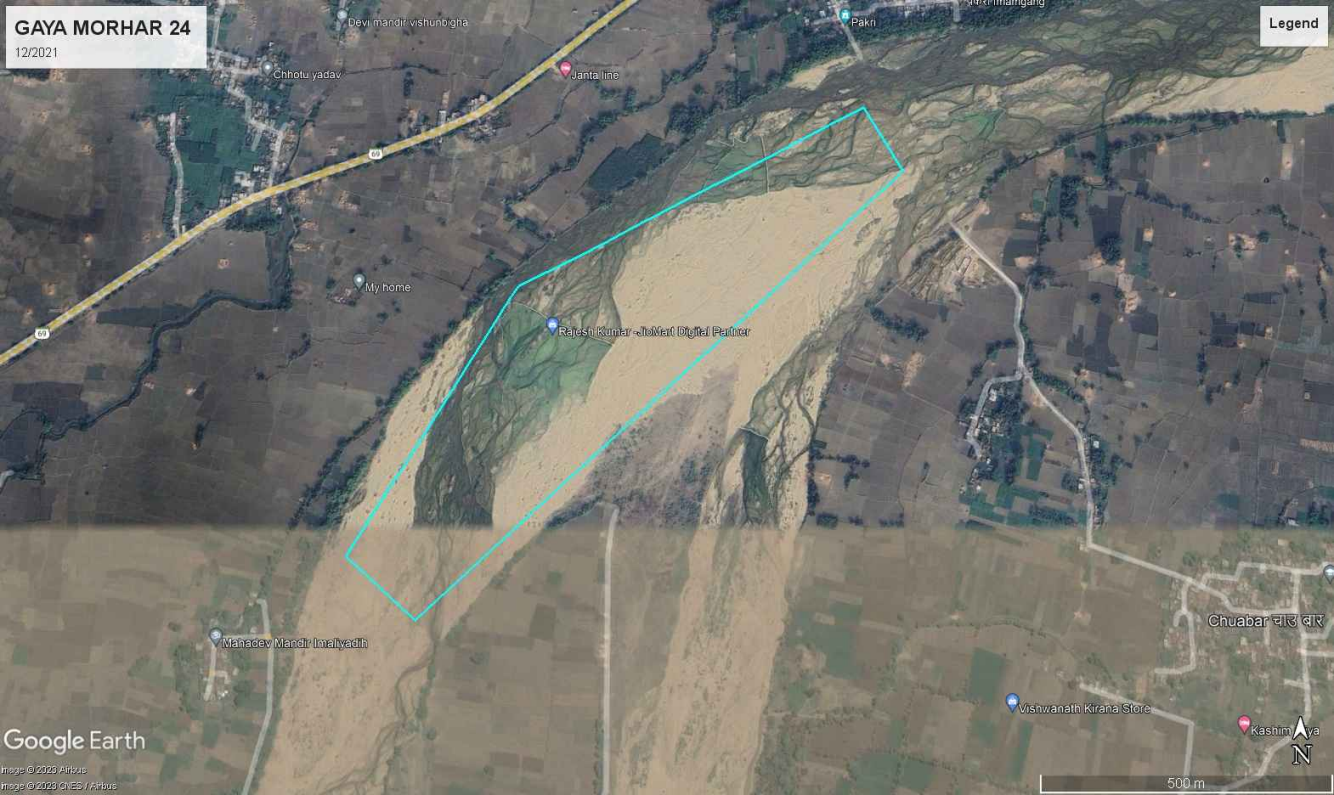
Legend

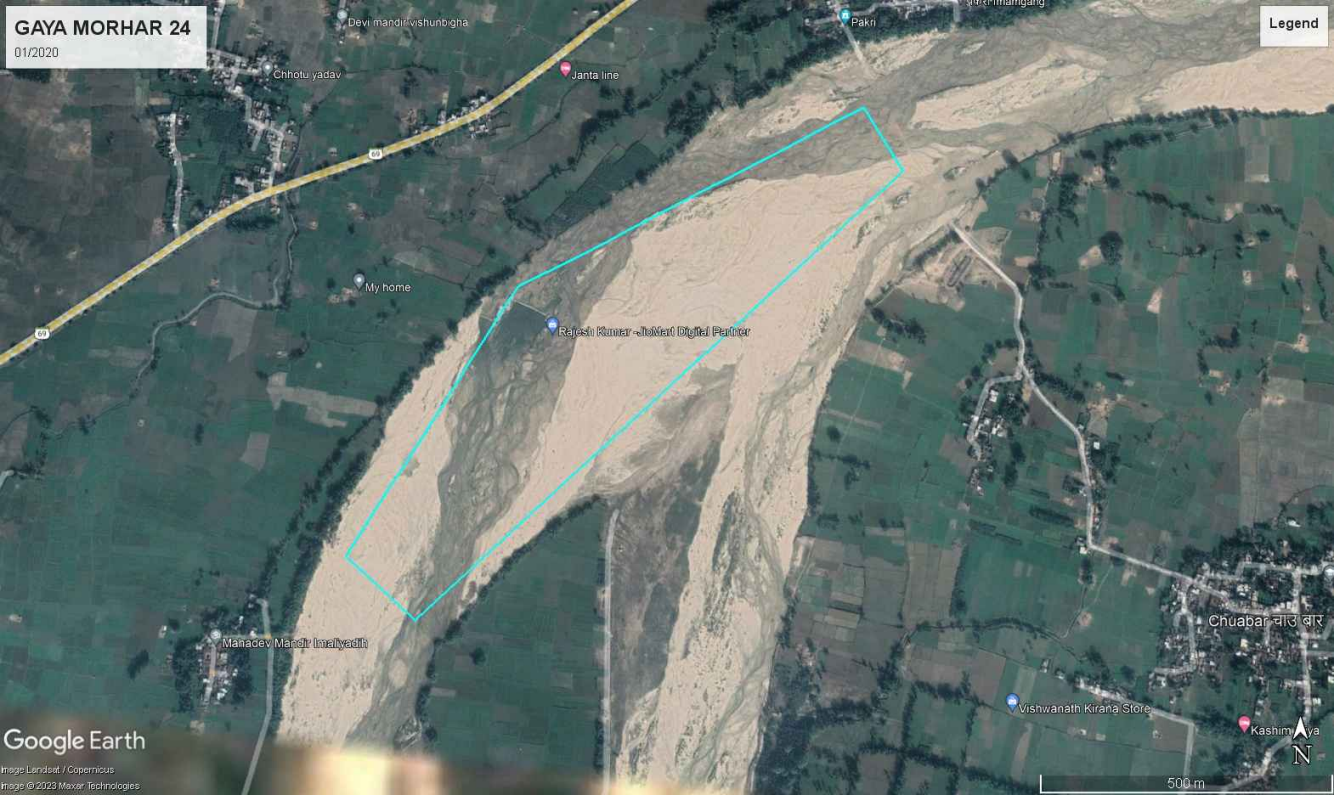


Google Earth

Image © 2023 Maxar Technologies
Image © 2023 Airbus







GAYA MORHAR 24

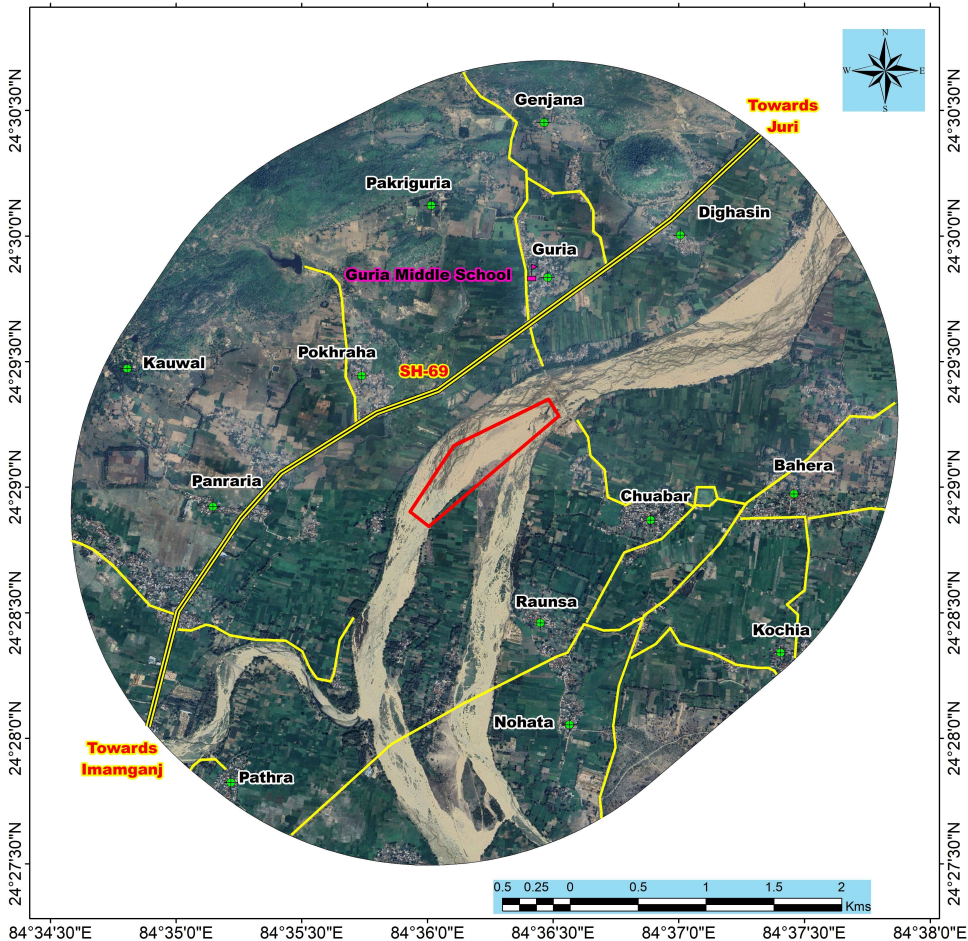
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Legend



Annexure –V
(2.5 Km Utility Map)

84°34'30"E 84°35'0"E 84°35'30"E 84°36'0"E 84°36'30"E 84°37'0"E 84°37'30"E 84°38'0"E



Towards
Juri

Genjana

Pakriguria

Dighasin

Guria

Guria Middle School

Pokhraha

SH-69

Kauwal

Panraria

Chuabar

Bahera

Raunsa

Kochia

Nohata

Pathra

Towards
Imamganj



Project Site



Buffer Area 2.5 Km

Legend



**School
Settlement
SH-69
Metalled Road**

Block- 37(Gaya Morhar-24)
Mauza- Babandih, Padaria,
Pakri Guriya & Chuawar,
Anchal- Imamganj, District- Gaya,
State- Bihar

Location Map

Annexure –VI
(English Executive Summary)

1 EXECUTIVE SUMMARY

1.1 Introduction

As per MoEF& CC, New Delhi Gazette dated 14th September 2006 and amended thereof, the proposed mining project is categorized as category B-1 due to project area is more than 5.0 Ha. The LOI was granted in favor of **Dinanath Singh Add- Lasarhi, P.O- Agiaon, P.S.- Garhani, District- Bhojpur, State- Bihar.** vide letter no- **5511/Khanan, Gaya dated 29-11-2022.**, for the period of 5 years (A copy of LOI is attached as Annexure-I.)

Mining Plan:The mining plan for the **Block -37 (GayaMorhar -24)** SandGhat has been approved with production capacity of **522000 cum per annum or 939600 TPA** from the Department of Mines & Geology, Govt. of Bihar through vide **letter No. 2290/M Patna dated 03/05/2023** under the Bihar Minor Minerals Concession Rules 2019.

ToRLetter: It is in this context, hard copy of Form-I and Pre-Feasibility Report has been submitted to SEIAA/SEAC, Bihar on **05.06.2023** requesting for issue of “Terms of Reference” (ToR). The ToR Letter has been issued on date 09.06.2023 by SEIAA, (File no- **SIA/1(a)/2435/2023**). Validity of TOR is for period of three years.

Baseline data collection: The baseline data was collected in summer season form 1st of March 2023 to31st of May 2023.

The Proposed Sand Mining Project at Thana No.- 314, 240, Khata No. 490,79,433,345, Khasra No. 2720, 592, 2785/2835, 1 in Mauza- Babandih, Padaria, Pakri Guriya & Chuawar, Block- Imamganj, District- Gaya, Bihar. Mine Lease Area – 29.0 Ha for production of 522000 cum per annum or 939600 TPA.

Table 1-1: Details of the Project

S. No.	Particulars	Details						
1.	Nature and Size of the Project	Mining of Sand Minor Minerals with Production Capacity of 522000 cum per annum or 939600 TPA(M.L. Area- 29.0 ha).						
2.	Location							
	Plot/Survey/Khasra No.	River Name	Mauza	Thana No.	Khata No.	Khasra No.	Name of the Ghat	Area (Ha)
			Babandih	314	490	2720	Block-	

		Morhar	Padaria	--	79	592	37 (Gaya Morhar-24)	29.0
			Pakri Guriya	240	433	2785/2835		
			Chuawar	--	345	1		
	Village	Mauza- Babandih, Padaria, Pakri Guriya & Chuawar						
	Block	Block- Imamganj						
	District	Gaya						
	State	Bihar						
3.	Geographical Coordinates Latitude and Longitude of	Block-37 (Gaya Morhar-24) Sand Ghat, Area: 29.0 Ha, Coordinates: -						
		Sl. No	Latitude		Longitude			
		1	24° 29' 20.96" N		84° 36' 28.86" E			
		2	24° 29' 16.89" N		84° 36' 31.34" E			
		3	24° 28' 50.51" N		84° 36' 0.40" E			
		4	24° 28' 54.11" N		84° 35' 55.88" E			
4.	Toposheet (OSM) No.	G45S6, G45S7, G45U10& G45U11						
5.	Lease Area Details							
	Lease Area	29.0 Ha.						
	Type of Land	River bed of Morhar						
	Topography	Undulated (Riverbed)						
	Site Elevation Range	169.5 ASML to 172.6 ASML						
6.	Cost Details							
	Cost of the project	Rs. 1282.8 lakhs. (Including Auction Cost)						
	Cost for EMP	7.05 Lakh (Capital Cost) & 10.44 Lakhs (Recurring Cost)						
7.	Environmental Settings of the area							
	Ecological Sensitive Areas (National Park, Wild Life Sanctuary, Biosphere Reserve, Reserve/ Protected Forest etc.) within 10 Km radius	There is no any Ecological Sensitive Areas (National Park, Wild Life Sanctuary, Biosphere Reserve, Reserve/ Protected Forest etc.) within 10 Km radius.						
	Nearest Town/ Major City with population	District Headquarter- Gaya, Approx 50.85 km in NE						

	Nearest Railway Station	Rafiganj Railway Station, approx. 36.2 Km towards North.
	Nearest National/State Highway	SH-69, Approx. 0.34 km towards NW.
	Nearest Airport	Gaya International Airport, approx. 44.23 Km towards NE.
	Nearest Post Office	Post Office Pakriguriya, Apprx. 1.0 Km towards North.
	Medical Facilities	Bankey Bazar Hospital (PHC), Tanrawa Approx. 5.19 Km towards West. Maa Bhagwati Hospital, Tanrawa Approx. 6.52 km towards NE.
	Education Facilities	Primary School, Nagwan. Approx. 6.14 Km towards SSE. Vidya Public School, PakriGuriya. Approx 0.45 km, towards North.
	Archaeological sites	There are no Archaeological sites within 10 km radius from project site.
	Seismic Zone	Zone III (IS 1893: 2002)
	Water Body	Morhar River (Riverbed)

1.2 Project Description

The proposed projectGaya Block 37 (Gaya Morhar 24) Ghat is for mining of Sand (Minor Mineral) by open cast semi-mechanized method in over an area of **29.0 Ha**. The project site falls under seismic zone III which is a Moderate damage risk zone (MSK VII). The total geological reserve is **870000 cum** and mineable reserve is **753243 Cum** Mine lease area will be workedin benches and the digging depth will be restricted to 3.0 m only or before water table, whichever come fast. This will be further replenished during rainy season. Mineral Sand will be transported by trucks. The deposit is moderate to good quality sand. It is widely used in construction, buildings, bridges and other infrastructure. It is free from clay and non-sticky in nature. Total water requirement for the project is **6.17 KLD**. Total man power requirement for the project is **30**.The site facilities like temporary, rest-shelter, first aid facility; drinking water facility etc. will be provided as per requirement. There is no litigation pending against this project.

1.3 Description of Environment

The generation of primary data as well as collection of secondary data and information from the site and surroundings was carried in Summer Season during 1st March 2023 to 31st May 2023.The EIA study is being done for the Mine Lease (core zone) and area within 10 Km

distance from mine lease boundary (buffer zone), both of which together comprise the study area. Baseline environment was determined within the study area, which represents 10 km radius of the surrounding area to the project site. This collected data was further used to identify potential impacts of the mining activity on the surrounding environment and formulate mitigation measures. Summary of the baseline data collected is detailed in Table 1.2.

Table 1-2 :- Baseline Environmental Status

Attribute	Baseline status
Ambient Air Quality	The ambient air quality study for the monitoring stations shows that the maximum and minimum ground level concentration for PM ₁₀ is respectively 90.4 µg/m³ at NEAR PROJECT SITE, (AAQ1) and 55.1 µg/m³ at Raunsa (AAQ 6) . Whereas the maximum and minimum ground level concentration for PM _{2.5} ranges between 50.0 µg/m³ at Pokhraha (AAQ 4) and 29.4 µg/m³ at Raunsa (AAQ6) . respectively. Similarly, for SO ₂ , the maximum and minimum ground level concentration varies between 17.2 µg/m³ and 5.9 µg/m³ for respectively Pokhraha (AAQ 4) and Chaubar (AAQ5) stations. For NO ₂ the maximum and minimum ground level concentration varies between 39.0 µg/m³& 14.6 µg/m³ for respectively Pokhraha (AAQ 4) and Panraria (AAQ 3) stations. For CO the maximum and minimum ground level concentration varies between 0.83 mg/m³& 0.17 mg /m³ for respectively Chaubar (AAQ5) and Bishunbigha (AAQ2) stations.
Noise Levels	<p>Noise monitoring study reveals that the minimum & maximum noise levels at day time were recorded as 46.1 dB (A) at Panraria (NQ3) & 52.6 dB (A) at Pokhraha and Kochia (NQ 4 and NQ 7). The minimum & maximum noise levels at night time were found to be 33.5 dB (A) at Jalwar (NQ 8) & 38.5 dB (A) at Bishunbigha (NQ 2).</p> <p>There are no other major noise producing sources in the study area except some domestic activities, which contributes to the local noise level of the area. Traffic movements in nearby villages also add to the ambient noise level of the area.</p>
Water Quality	<p>5 Groundwater samples and 4 surface water samples were analyzed and concluded that:</p> <p>The ground water from all sources remains suitable for drinking purposes as all the constituents are within the limits prescribed by drinking water standards by Indian Standards IS: 10500.</p> <p>From the Surface water analysis, the river water quality parameters are compared with BDU Criteria of CPCB. No metal contamination has been</p>

	found in surface water samples. Overall, the surface water quality of river is meeting the Class D of DBU Criteria of CPCB for its suitability for wild life and fisheries.
Soil Quality	Samples collected from 5 identified locations indicate pH value ranging from 7.0 to 7.8 which shows that the soil is slightly alkaline in nature. Organic Matter ranges from 1.38% to 1.61% in the soil samples and, whereas the Potassium is found to be ranging from 185.8 to 281.4 mg/kg.
Ecology and Bio-diversity	There are no Ecologically Sensitive Areas present in the study area.

1.4 Anticipated Impacts and Mitigation Measures

Based on the Baseline Environment, as determined in Chapter 3, environmental impacts of the mining activity on the surrounding environment are described in following sub-sections.

1.4.1 Impact on Land Use Pattern

Presently there is no activity on the land. The project site is located on bank of river. There is no human settlement in the near vicinity of the project. Restoration of mine lease area is a natural process. There would not be cutting & felling of trees.

1.4.2 Impact on Air Quality

Information on air quality was studied and predicted that the mining activity will not affect the air quality in a significant manner. In mining operations, loading, and transportation operations may cause the deterioration in air quality. In the present case, only wet materials will be handled. The collection and lifting of minerals will be done Semi mechanized mining method shall be adopted for the mining of sand. Therefore, the dust generated is insignificant. Water sprinkling will be done in regular manner for dust suppression.

1.4.3 Impact of Noise Levels

Noise level will increase due to transportation. The project site away from the villages no major impact of the noise level will be there. Vehicle with low noise level will be preferred for the project.

1.4.4 Impact on Water Quality

More over due to small scale of mining operation using minimum machineries, dust suppression is by water spraying through water sprinkler limited to haulage road. Rainwater flowing through the exposed mine cuts would carry some sediment of soil and rock. These are found to be nontoxic in nature and the runoff from mining area are the deposits of the river

which were carried in past. Surface runoff water from mines has only high turbidity during monsoon. As discussed, the mining activity will require very less quantity of water in comparison to the recharging. Hence, it will not affect the water regime of the area.

1.4.5 Impact on Soil Quality

The soil textures a yellowish, light-colored variety of red soil. The basin land of the rivers is mostly sandy soil, and the land adjacent to the rivers is sandy loam. It is due to settling of air borne dust or due to wash off of solid particulates by surface or ground water. This may lead to change in porosity, permeability & other such physical characteristics of soil of the area.

1.4.6 Flora & Fauna

Flora

Floral environment is affected by mining activities due to:

- Air Pollution i.e. both dust & gaseous pollution
- Water pollution
- Land Pollution

Pollutant like dust, gaseous emanations, solid & liquid effluents will be minimized at the generation point itself and adequate measures will be taken to prevent their impact on environment.

ii) There is no forest in the core zone of mining lease area and its surrounding. So, there will be no deforestation due to mining.

iii) The mining lease area is devoid of vegetation. So, the greenery to be developed under green belt development programme will improve the floral environment of the area.

Fauna

There is no likelihood of any adverse impact on the faunal environment too due to mining activities.

1.4.7 Socio-Economic Profile

The social demographic profile of the area is not likely to be much affected, as there is not much displacement of people due to the project. The mining in the area will create rural employment. The mining activity in the region has positive impact on the social economic condition of the area by providing employment to the local inhabitants; wages paid increase the per capita income.

1.5 Analysis of Alternatives (Technology and Site)

We have analyzed all the option for alternatives of the proposed mine site. This project is sand specific project and existing land use of mine lease classified as River Body which will continue to be so even after the current mining project is over, hence no alternate site is suggested for this project.

1.6 Environmental Monitoring Program

This chapter includes the technical aspects of monitoring the effectiveness of mitigation measures (including measurement methodologies, data analysis, reporting schedules, emergency procedures, detailed budget & procurement schedules). In order to maintain the environmental quality within the stipulated standards, regular monitoring of various environmental components is necessary which will have complied as per conditions. For this lessee **Dinanath Singh** taken decision to formulate an Environment Policy of the mine and constitute an Environmental Management Cell and committed to operate the proposed mine with the objectives mentioned in approved Environment Policy. EMP may also require measurement of ambient environmental quality in the vicinity of a sit using ecological/biological, physical and chemical indicators. Monitoring may include socio-economic interaction, through local liaison activities or even assessment of complaints. Regular Monitoring of all the environmental parameters viz., air, water, noise and soil as per the formulated program based on CPCB and MoEF&CC guidelines will be carried out every year. The location of the monitoring stations was selected on the basis of prevailing micro meteorological conditions of the area like; wind direction and wind speed, relative humidity, temperature. A budget for monitoring of Air, water, Noise and Soil will be **Rs. 2.0 Lakhs** to be incurred by the project proponent for undertaking pollution prevention measures during the mining activity.

1.7 ADDITIONAL STUDIES

Risk assessments will help to priorities the risks and provide information on the need to safely control the risks. In this way, mine owners and operators will be able to implement safety improvements. Mining and allied activities are associated with several potential hazards to both the employees and the public at large. A worker in a mine will be able to work under conditions, which are adequately safe and healthy. At the same time the environmental conditions also will not impair his working efficiency. This is possible only when there is adequate safety in mines. Hence mine safety is one of the most essential aspects of any working mine. It is very important to conserve the scheduled fauna in the area by the local authority as well as by the forest officials. People are not aware about the wildlife and

protection of wild animals. There is an urgent need of education and awareness to local people about the wild life and their importance. A green belt will be developed around the core zone. Green belt plantation will be done upto completion of plan period. This mining project has positive impact on social and economic well-being of the community because this project provides employment opportunities to local people and many social welfares works done by project proponent. There is no displacement of the population within the project area and adjacent nearby area.

1.8 Project Benefits

The management will recruit the semi-skilled and unskilled workers from the nearby villages. The project activity and the management will definitely support the local Panchayat and provide other form of assistance for the development of public amenities in this region. The company management will contribute to the local schools, dispensaries for the welfare of the villagers. A suitable combination of trees that can grow fast and also have good leaf cover will be adopted to develop the green belt. It is proposed to plant **290 Nos.** of native species will be planted during the mining plan period. Other than this social development of village will be considered as per social activities. Socio-economic environment will have positive impact due to the mining project in the area. The mining activity will create employment opportunities to local communities. The project will not only improve the living standard of local people but also create an aesthetic value to the river banks where green belt will be developed.

1.9 Environment Management Plan

As per Above discussion there is no measure impact on the environment due to mining except fugitive emission in the form of dust generated during handling of mineral. The adequate preventive measures will be adopted to contain the various pollutants within permissible limits. Plantation development will be carried out in the mine premises, along the approach roads, around Govt. buildings, schools approx. **290 trees during plan period.** It will prove an effective pollution mitigate technique, and he provided to the locals only as providing extraction of minerals from the mine site is the only prevailing occupation for them for their livelihood. A budget of **Rs 7.05 Lakh (Capital Cost) &10.44 Lakhs (Recurring Cost)** per year for **EMP** is incurred by Project Proponent.

1.9.1 Air Quality Management

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 from the trucks. Overloading will be prevented. Plantation activities along the roads will also reduce the impact of dust in the nearby villages.

1.9.2 Management for Noise Pollution

As the only impact is due to transportation of sand to the construction through village roads, emphasis will be given on the following points.

- Minimum use of Horns at 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 along the road networks.
- Care will be taken to produce minimum sound during loading.

It was found that the sand mining activity will not have any significant impact on the biological environment of the region. Since mining activity is carried out only during the day time, the movement of animals during the night will not be hindered.

1.9.3 Water Management

The deposits occur in the middle/bottom of the river. During the entire lease period, the deposit will be worked from the top surface to 3 m bgl or above ground water level, whichever comes first.

1.9.4 Soil Management

Topsoil is stored separately and used for plantation work in the mined-out area. Green belt development around the area minimizes the impact of mining on soil characteristics like its texture, chemistry & even Soil Erosion in the area.

1.9.5 Green Belt Development

The green belts will be designed to control PM 10, gaseous pollutants, noise, surface run off and soil erosion etc.

1.10 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. Only supervisor Staff will be hired from outside. 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. From the baseline study and various discussions on probable impacts of all the operational activity, it has been concluded that this project will have more positive impact and will generate the revenue and employment in the area. On the above facts and baseline study, the proposed activity is recommended for the commencement with proper mitigation measure as suggested.

Annexure –VII
(Hindi Executive Summary)

कार्यकारी सारांश

पर्यावरण प्रभाव आंकलन

ब्लॉक- 37 (गया मोरहर- 24) मोरहर नदी पर बालू घाट

मौजा- बबनडीह, पड़रिया, पकरी गुरिया और चुआवर, ब्लॉक- इमामगंज, जिला- गया, राज्य – बिहार ।

द्वारा

परियोजना प्रस्तावक

आवेदक- दीनानाथ सिंह , पता- लसारही, पी.ओ.- अगियाँव, पी.एस.- गड़हनी, जिला – भोजपुर, राज्य – बिहार ।

पर्यावरणीय सलाहकार

रियान एनवायरो प्राइवेट लिमिटेड

1 कार्यकारी सारांश

1.1 परिचय

पर्यावरण एवं वन मंत्रालय, नई दिल्ली राजपत्र दिनांक 14 सितंबर 2006 और उसमें संशोधन के अनुसार, प्रस्तावित खनन परियोजना को श्रेणी बी- 1 के रूप में वर्गीकृत किया गया है क्योंकि परियोजना क्षेत्र 5.0 हेक्टेयर से अधिक है। गया DMO के द्वारा LOI आवेदक – दीनानाथ सिंह, पता – लसारही, पी.ओ. – अगियाँव, पी.एस. – गड़हनी, जिला – भोजपुर, राज्य - बिहार के पक्ष में पत्र संख्य - 5511/ख, दिनांक 29.11.2022 के माध्यम से 5 वर्ष की अवधि के लिए प्रदान किया गया है।

खनन योजना –ब्लॉक- 37 (गया मोरहर- 24) बालू घाट के लिए खनन योजना को 522000 घन मीटर प्रति वर्ष या 939600 TPA की उत्पादन क्षमता के साथ खान एवं भूतत्व विभाग, बिहार सरकार के पत्रांक 2290/एम पटना, दिनांक 03/05/2023 के माध्यम से अनुमोदित किया गया है।

TOR पत्र: Terms of Reference (TOR), दिनांक- 05.06.2023 को SEIAA, बिहार को फॉर्म- I और पूर्व-व्यवहार्यता रिपोर्ट की हार्ड कॉपी प्रस्तुत की गई है। TOR पत्र दिनांक- 09.06.2023 को SEIAA द्वारा जारी किया गया है, (फाइल संख्या. SIA/1(a)/2435/2023) TOR वैधता तीन साल की अवधि के लिए है।

बेसलाइन डेटा संग्रह बेसलाइन डेटा ग्रीष्म ऋतु के रूप में : 1 मार्च 2023 से 31 मई 2023 तक एकत्र किया गया था।

परियोजना स्थल का विवरण: प्रस्तावित बालू खनन परियोजना ब्लॉक- 37 (गया मोरहर- 24) बालू घाट, थाना संख्या - 314, 240, खाता संख्या- 490, 79, 433, 345, खसरा संख्या- 2720, 592, 2785/2835 मौजा- बबनडीह, पड़रिया, पकरी गुरिया और चुआवर, ब्लॉक- इमामगंज, जिला- गया, राज्य – बिहार।

खान पट्टा क्षेत्र – 29.0 Ha है जो 522000 घन मीटर या 939600 TPA के उत्पादन के लिए हैं। प्रस्तावित खनन पट्टा क्षेत्र भारतीय सर्वेक्षण Toposheet G45S6, G45S7, G45U10, G45U11 के अंतर्गत आता है।

1.2 परियोजनाका विवरण

बालू घाट का नाम	ब्लॉक- 37 (गया मोरहर- 24) बालू घाट			
क्षेत्रफल (हेक्टेयर)	29.0 Ha			
टन/वर्ष में उत्पादन	522000 घन मीटर या 939600 TPA			
जल की आवश्यकता	धूल दमन	घरेलू	ग्रीन बेल्ट डेवलपमेंट	
	5.0	0.3	0.87	
	कुल: 6.17 KLD			
कामगारों की संख्या	30			
परियोजना की अनुमानित लागत (लाख में)	1282.8 लाख			
EMP लागत (लाख में)	पूंजी लागत: 7.05 लाख और आवर्ती लागत: 10.44 लाख			

1.3 माइनिंग लीज कोऑर्डिनेट्स

ब्लॉक- 37 (गया मोरहर- 24) बालू घाट

क्र. संख्या	अक्षांश	देशांतर
1	24° 29' 20.96" N	84° 36' 28.86" E
2	24° 29' 16.89" N	84° 36' 31.34" E
3	24° 28' 50.51" N	84° 36' 0.40" E
4	24° 28' 54.11" N	84° 35' 55.88" E

1.4 खनन पद्धति का विवरण

- खनन प्रक्रिया ड्रिलिंग और ब्लास्टिंग के बिना ओपनकास्ट अर्ध-मशीनीकृत विधि के द्वारा की जाएगी।
- बाढ़ के दौरान खनन की कोई गतिविधि नहीं की जाएगी।
- खनन की प्रक्रिया केवल 3 मीटर की गहराई तक ही की जाएगी।
- बालू का खनन मानसून के दौरान पूरी तरह से बंद रहेगी।
- बालू खनन नदी के बहाव क्षेत्र तक ही रहेगा।
- नदी के सूखे क्षेत्र में खनन किया जायेगा।
- नदी के प्राकृतिक प्रवाह को बाधित नहीं किया जायेगा।

1.5 खनिज का उपयोग

बालू का उपयोग जैसे: सड़को, इमारतों, पुलों आदि के निर्माण कार्य में किया जायेगा।

1.6 पर्यावरण संवेदनशीलता

1.	पारिस्थितिक संवेदनशील क्षेत्र राष्ट्रीय उद्यान, वन्य जीवन अभयारण्य, बायोस्फीयर रिजर्व / रिजर्व संरक्षित वन आदि 10 किलोमीटर के दायरे में।	10 किलोमीटर के दायरे में कोई भी पारिस्थितिक संवेदनशील क्षेत्र (राष्ट्रीय उद्यान, वन्य जीवन अभयारण्य, बायोस्फीयर रिजर्व, रिजर्व/संरक्षित वन आदि) नहीं है।
	जनसंख्या के साथ निकटतम शहर / प्रमुख शहर	जिला मुख्यालय- गया, लगभग 50.85 Km पूर्वोत्तर की ओर।
2.	निकटतम रेलवे स्टेशन	रफीगंज रेलवे स्टेशन, लगभग 36.2 Km उत्तर की ओर।
	निकटतम राष्ट्रीय / राज्यमार्ग	SH-69, लगभग 0.34 Km. NW की ओर।
	निकटतम हवाई अड्डा	गया अंतर्राष्ट्रीय हवाई अड्डा लगभग 44.23 Km उत्तर पूर्व की ओर।
	निकटतम डाकघर	पकरीगुरिया, डाकघर लगभग 1.0 Km. उत्तर की ओर।
3.	चिकित्सकीय सुविधाएं	बांके बाजार अस्पताल (पीएचसी) तनरावा, लगभग 5.19 Km. पश्चिम की ओर, माँ भगवती अस्पताल, तनरावा लगभग 6.52 Km. उत्तर पूर्व की ओर।
4.	शिक्षा सुविधाएं	प्राथमिक विद्यालय नगवाँ, लगभग 6.14Km SSE की ओर विद्या पब्लिक स्कूल, पकरीगुरिया लगभग 0.45 Km .उत्तर की ओर।
5.	भूकंपीय क्षेत्र	जोन III (IS 1893-2002)
6.	जल निकाय	मोरहर नदी

1.7 स्थल सुविधाएं और उनकी उपयोगिता

जलआपूर्ति: खनन के दौरान पानी की आवश्यकता मुख्य रूप से धूल के दमन, हरित पट्टी के विकाश, पेय जल प्रयोजन और अन्य घरेलू कार्यों के लिए होगी। पानी की आवश्यकता नजदीकी स्रोतों जैसे हैंड पंप एवं प्राइवेट टैंकों से पूरी की जाएगी।

अस्थायी आवास: श्रमिकों को विश्राम के लिए खनन स्थल के नजदीक एक अस्थायी आवास उपलब्ध कराया जायेगा। इसके अतिरिक्त श्रमिकों के लिए प्राथमिक चिकित्सा बॉक्स, कल्याण सुविधाएं इत्यादि उपलब्ध कराये जायेंगे। खनन कार्य में लगे लोगो की सुरक्षा को देखते हुए उन्हें दस्तानो और जूते भी उपलब्ध कराये जायेंगे।

1.8 पर्यावरण का विवरण

बेसलाईन पर्यावरण खनन पट्टा के सीमा से 10 किलो मीटर का क्षेत्र है जिसका अध्ययन 1 मार्च 2023 से 31 मई 2023 के बीच की गई थी।

एकत्र किए गए बेसलाइन डेटा का सारांश नीचे की तालिका में दी गई है:

गुण	आधारभूत स्थिति
परिवेशी वायु गुणवत्ता	निगरानी स्टेशनों के लिए परिवेशी वायु गुणवत्ता अध्ययन से पता चलता है कि PM10 के लिए अधिकतम और न्यूनतम जमीनी स्तर की सांद्रता क्रमशः निकट परियोजना स्थल (AAQ1) पर 90.4 $\mu\text{g}/\text{m}^3$ और रौंसा (AAQ6) पर 55.1 $\mu\text{g}/\text{m}^3$ है। जबकि PM2.5 के लिए अधिकतम और न्यूनतम जमीनी स्तर की सांद्रता पोखराहा (AAQ4) में 50.0 $\mu\text{g}/\text{m}^3$ और रौंसा (AAQ6) में 29.4 $\mu\text{g}/\text{m}^3$ के बीच है। क्रमशः इसी प्रकार, SO2 के लिए, अधिकतम और न्यूनतम जमीनी स्तर की सांद्रता क्रमशः पोखराहा (AAQ4) और चौबार (AAQ5) स्टेशनों के लिए 17.2 $\mu\text{g}/\text{m}^3$ और 5.9 $\mu\text{g}/\text{m}^3$ के बीच भिन्न होती है। NO2 के लिए अधिकतम और न्यूनतम जमीनी स्तर की सांद्रता क्रमशः पोखराहा (AAQ4) और पनरारिया (AAQ3) स्टेशनों के लिए 39.0 $\mu\text{g}/\text{m}^3$ और 14.6 $\mu\text{g}/\text{m}^3$ के बीच होती है। CO के लिए अधिकतम और न्यूनतम जमीनी स्तर की सांद्रता क्रमशः चौबार (AAQ5)

	और बिशुनबिगहा (AAQ2) स्टेशनों के लिए 0.83 mg/m³ और 0.17 mg/m³ के बीच भिन्न होती है।
ध्वनि का स्तर	<p>ध्वनि निगरानी अध्ययन से पता चलता है कि दिन के समय न्यूनतम और अधिकतम ध्वनि स्तर पनरारिया (NQ3) में 46.1 dB(A) और पोखराहा और कोचिया (NQ4 और NQ7) में 52.6 dB(A) दर्ज किया गया था। रात के समय न्यूनतम और अधिकतम शोर स्तर जलवार (NQ8) में 33.5 dB(A) और बिशुनबीघा (NQ2) में 38.5 dB(A) पाया गया।</p> <p>अध्ययन क्षेत्र में कुछ घरेलू गतिविधियों को छोड़कर कोई अन्य प्रमुख ध्वनि पैदा करने वाला स्रोत नहीं है, जो क्षेत्र के स्थानीय ध्वनि स्तर में योगदान देता है। आस-पास के गाँवों में यातायात की गतिविधियाँ भी क्षेत्र के परिवेशीय ध्वनि स्तर को बढ़ाती हैं।</p>
पानी की गुणवत्ता	<p>भूजल के 5 और सतही पानी के 4 नमूनों का किए गए विश्लेषण से निष्कर्ष निकाला गया कि सभी स्रोतों से भूजल पीने के उद्देश्यों के लिए उपयुक्त है। सभी नमूने पीने के पानी द्वारा निर्धारित सीमा के भीतर हैं।</p> <p>भारतीय मानक IS: 10500 द्वारा मानक सतही जल विश्लेषण से यह स्पष्ट होता है कि अधिकांश नमूने जो की CPCB के DBU मानदंड की 'श्रेणी 'D' का अनुपालन करते हैं एवं वन्य जीवन और मत्स्य पालन के लिए उपर्युक्त हैं।</p>
मिट्टी की गुणवत्ता	<p>पहचान किए गए स्थानों से एकत्र किए गए नमूने pH मान को इंगित करते हैं 7.0 से 7.8 जो दर्शाता है कि मिट्टी प्रकृति में थोड़ी क्षारीय है। कार्बनिकमिट्टी के नमूनों में पदार्थ 1.38% से 1.61% तक होता है, जब कि पोटेशियम 185.8 mg/kg से 281.4 mg/kg तक पाया जाता है।</p>

<p>पारिस्थिति की और जैव विविधता</p>	<p>अध्ययन क्षेत्र में कोई पारिस्थितिक रूप से संवेदनशील क्षेत्र मौजूद नहीं है।</p>
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1.9 पर्यावरण पर प्रभाव एवं उसकी रोकथाम

वायु पर्यावरण

वायु की गुणवत्ता का अध्ययन किया गया तथा देखा गया की खनन की गतिविधि से वायु की गुणवत्ता पर कोई खास प्रभाव नहीं पड़ेगा। वायु प्रदूषण का जो मुख्य स्रोत ट्रकों एवं ट्रैक्टरों का स्थानांतरण और खनन की गतिविधियों में लोडिंग स्थानांतरण और अनलोडिंग के कारण शुष्क सामग्री की वजह से वायु की गुणवत्ता में कुछ गिरावट आ सकती है।

शमन के उपाय

- धूल को उड़ने से बचाने के उपाय किये जायेंगे जैसे सड़को पर पानी का छिड़काव किया जायेगा।
- तिरपाल से ढक कर बालू का परिवहन होगा ताकि बालू को उड़ने या गिरने से रोका जा सके।
- वाहनों की ओवर लोडिंग नहीं की जायेगी।
- पुराने और खराब हो चुके ट्रकों एवं ट्रैक्टरों का इतेमाल नहीं किया जायेगा।
- नदी के किनारों और सड़क के दोनों तरफ वृक्षारोपण का कार्य किया जायेगा।

जल पर्यावरण

भूमिगत जल पर प्रभाव की जानने के लिए एक व्यापक जल भूवैज्ञानिक अध्ययन किया गया है अध्ययन से निष्कर्ष निकाला गया की खनन के कारण आस पास के भूमिगत जल स्तर पर कोई प्रत्यक्ष प्रभाव नहीं पड़ेगा। खनन की गतिविधि के लिए जल की कोई आवश्यकता नहीं होती है। खनन कार्य नदी के सूखे भाग पर ही किया जायेगा। नदी के मुख्य चैनल से कोई छेड़-छाड़ नहीं की जाएगी।

ध्वनि पर्यावरण

खान में उत्पन्न ध्वनि अर्द्ध-यांत्रिक खनन गतिविधियों और ट्रकों की स्थानांतरण गतियों के कारण होगा। खनन गतिविधि के कारण उत्पन्न ध्वनि खान के भीतर तक ही सीमित रहेगा। आस पास के गांव पर खनन का की

गतिविधि का कोई खास प्रभाव नहीं पड़ेगा, हालांकि ध्वनि के उपरोक्त स्तर का प्रभाव केवल सक्रिय कार्यशील क्षेत्र के आस पास ही महसूस किया जायेगा।

निम्न स्तर का ध्वनि सहनीय है और इसका मानव पर कोई बुरा प्रभाव नहीं पड़ता, लेकिन जब यह बहुत ज्यादा होता है तब इसके हानिकारक प्रभाव हो सकते हैं।

इस मामले में आस पास की आबादी पर ध्वनि का प्रभाव नगण्य है क्योंकि आबादी खनन क्षेत्र से दूर है।

शमन के उपाय

- गांव के क्षेत्रों में ध्वनि यंत्र (Horn) का न्यूनतम उपयोग किया जायेगा।
- नदी के किनारों और सड़क के दोनों तरफ वृक्षारोपण का कार्य किया जायेगा।
- खनिकों के कानों की सुरक्षा के लिए ईयर-मफ उपलब्ध कराये जायेंगे।
- वाहनों का उचित रख रखाव किया जायेगा।

1.10 पर्यावरणीय प्रबंधन योजना

- रेलवे लाइन, जलाशय, नदी के दोनों किनारों एवं जल के प्रवाह से अथवा सड़क से सुरक्षित दूरी को छोड़कर ही खनन कार्य किया जायेगा।
- वन क्षेत्र में खनन की अनुमति नहीं होगी।
- पट्टा की अवधि के दौरान, खनन कार्य सतह से 3 मीटर की गहराई तक या भूजल स्तर से उपर, जो भी काम हो, किया जायेगा।
- बाढ़ के दौरान खनन की कोई गतिविधि नहीं की जाएगी।
- पर्यावरण प्रबंधन योजना के तहत इस परियोजना के लिए कुल 10.44 लाख रुपये की व्यवस्था की गई है जो हॉल रोड को बनाने, कच्चे सड़क पर धूल शमन के लिए पानी की छिड़काव, वृक्षारोपण एवं उनके रख रखाव के लिए होंगे।
- खनन कार्य में लगे मजदूरों के नियमित स्वास्थ्य की जाँच की जाएगी।
- स्वास्थ्य पर पड़ने वाले प्रभाव को काम करने के लिए प्रभाव क्षेत्र में श्रमिकों और आस पास के लोगों को स्वस्थ सुविधाएं मुहैया कराई जाएगी।
- नदी के खनन क्षेत्र तक पहुंचने के लिए सड़को की संख्या न्यूनतम होगी, जिसके लिए नदी के किनारों को नहीं काटी जायेगी।
- यह सुनिश्चित किया जायेगा की नदी के खनन क्षेत्र में तालाब की स्थिति न बने।

- आस पास के तालाबों, कुओं और बोर वेल्स में पानी के स्तर में उतार चढ़ाव का मापन किया जायेगा।
- सड़क के दोनों किनारों पर वृक्षारोपण किया जायेगा।
- खनन क्षेत्र तथा इसके आस पास कचरे के डिब्बों की व्यवस्था की जायेगी तथा इनके भर जाने पर इनका नियमानुसार निस्तारण किया जायेगा।

1.11 खनन के लाभ

भौतिक लाभ

प्रस्तावित परियोजना के खुलने से आसपास के निम्नलिखित क्षेत्रों में भौतिक बुनियादी ढांचे को बढ़ावा मिलेगा

1. सड़क परिवहन या सड़क संपर्क में वृद्धि।
2. खनिज से अच्छे बाजारी अवसर मिलेंगे।
3. हरियाली / वृक्षारोपण को बढ़ावा।

सामाजिक लाभ

1. प्रत्यक्ष एवं अप्रत्यक्ष रूप से रोजगार में वृद्धि।
2. खनिज के बिक्री से राजस्व प्राप्त होगा।
3. स्वस्थ सम्बन्धी गतिविधियों को बढ़ावा।

पर्यावरणीय लाभ

1. वैज्ञानिक खनन से पर्यावरण दुष्प्रभाव में कमी।
 2. वैज्ञानिक खनन से नदी के किनारों के आस पास पर उगी फसलों की सुरक्षा।
 3. अवैध खनन की गतिविधि में कमी।
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