DRAFT ENVIRONMENTAL IMPACT ASSESSMENT
AND
ENVIRONMENTAL MANAGEMENT PLAN

FOR

MIN_JPG_31

Project area 20.85 ha.

Block- Jalpaiguri, District: Jalpaiguri, State: West Bengal
Peak Rated Capacity: Sand: 233520 Cum/Year,
Pebbles & Gravels: 350280 Cum/Year

Project Applicant

M/s West Bengal Mineral Development & Trading Corporation Limited (WBMDTCL)

Centre for Envotech and Management Consultancy Pvt. Ltd.

AN ISO: 9001:2015, ISO 14001:2015 & ISO 45001:2018 certified company,
Empanelled with OCCL, Govt. of Odisha, OSPCB as Category "A" Consultant Organization,
Accredited by NABET, Quality Council of India for EIA studies
As Category "A" Consultant Organization
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DECLARATION

Declaration by Experts contributing to the EIA report for Environment Clearance in respect of proposed MIN_JPG_31 at Dist: Jalpaiguri, West Bengal by M/s West Bengal Mineral Development and Trading Corporation Limited.

This project falls under Sl. No. 1(a), [i.e., Riverbed sand mining)] of Category "B1" of the list of the projects of the schedule shall require prior Environmental Clearance from Ministry of Environment, Forest & Climate Change (MoEF&CC), Govt.of India. We, hereby, certify that we were part of the EIA team in the following capacity that developed the above EIA.

EIA Co-ordinator : Riverbed sand mining

Name : Mr. Debashish Mishra

Centre for Envotech and Management Consultancy Pvt. Ltd.

AN ISO: 9001:2015, ISO 14001:2015 & ISO 45001:2018 certified company,

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V	CER Undertaking

Chapter-1

INTRODUCTION

1.1 GENERAL INFORMATION

MIN_JPG_31 Sand Mine project, which belongs to Teesta River bed is located at P.S.: Jalpaiguri, Block- Jalpaiguri, District: Jalpaiguri, State: West Bengal. The LOI was granted in favor of M/s. West Bengal Mineral Development and Trading Corporation Limited (WBMDTCL) dated 05.07.2023 vide memo no. 430-ICE-12011 (99)/27/2022-MINES SEC-Dept. of ICE (**Annexure I**).

1.1.1 Mine plan and Progressive Mine Closure Plan: Modified Mining Plan and Progressive Mine Closure Plan of the proposed mine lease area is prepared by QP Shouri Dutta. This Mine Plan is approved vide letter No. G.P. 10-10A/ (WBMDTCL)/2023/80 dated 05.04.2024.

Mine plan was approved by Superintending Geologist of West Bengal on 05.04.2024 **(Annexure II)**.

1.1.2 Environment Consultant: The lessee has hired an Environment Consultant *i.e.* Centre for Envotech and Management Consultancy Private Limited, Plot no-522/3458, (near Utkal Hyundai Showroom) Pahal, Bhubaneswar-752101 (QCI/NABET Accredited Consultant-Category-A) for preparation of Environmental Impact Assessment Report for obtaining Environmental Clearance from SEIAA/SEAC West Bengal.

1.1.3 ToR Letter: It is in this context, Form-I and Pre-Feasibility Report has been submitted to Parivesh portal, West Bengal on 23.05.2024 requesting for issue of "Terms of Reference" (ToR). The technical presentation for ToR before SEAC, West Bengal was held on 29.05.2024. Subsequently, the ToR Letter has been issued on 19.07.2024 by SEIAA, (File no. EN/T-II-I/110/2024).

1.2 IDENTIFICATION OF PROJECT AND PROJECT PROPONENT

MIN_JPG_31 is a Sand Mine for the production of 233520 cum/year sand and 350280 cum/year pebbles and gravels from the lease hold area of 20.85 Ha, at P.S.: Jalpaiguri, Block- Jalpaiguri, District: Jalpaiguri, State: West Bengal.

Identification of Project Proponent Applicant: West Bengal Mineral Development & Trading Corporation Limited. Address: WBIIDC Building, 3rd Floor, DJ-10, Sector-II, Salt Lake, Kolkata – 700091.

1.3 ENVIRONMENTAL CLEARANCE

The proposed sand mining project P.S.: Jalpaiguri, Block- Jalpaiguri, District: Jalpaiguri, State: West Bengal falls in Category "B1", 1(a), due to mining lease area is more than 5 Ha as per OM dated 12th December, 2018 project by SEIAA, West Bengal. Lessee will have to take Environmental Clearance from SEIAA, West Bengal as per EIA notification September, 2006 amended in December 2009 and April 2011 and amendment there of to start the mining process.

1.4 BRIEF DESCRIPTION OF NATURE, SIZE AND LOCATION OF THE PROJECT

S. No.	**Particulars**	**Details**			
1	Nature and Size of the Project	Mining of Sand, and Pebbles and Gravels Minor Minerals with Production Capacity around 583800 Cum/Year of minerals (233520 Cum/year (Sand), 350280 cum/year Pebbles and Gravels. (M.L. Area- 20.85 Ha).			
2	**Location**				
	Plot/Survey/ Khasra No.	**River Name**	**J.L. No.**	**Plot No.**	**Area (Ha.)**
		Teesta			20.85
	Mauza	-			
	Block	Jalpaiguri			
	District	Jalpaiguri			
	State	West Bengal			
Geographical Coordinates	**Latitude and Longitude**	Point ID	Latitude	Longitude	
		1	26° 32' 16.672" N	88° 45' 18.611" E	
		2	26° 32' 35.569" N	88° 45' 21.739" E	
		3	26° 32' 34.025" N	88° 45' 34.924" E	
		4	26° 32' 16.495" N	88° 45' 32.008" N	
	Toposheet No.	G45K14			
3	**Lease Area Details**				
	Lease Area	20.85 Ha			
	Type of Land	Riverbed			
	Topography	Undulated (Riverbed)			

4	**Cost Details**	
	Cost of the project	Rs. 22,53,37,716/-
	Cost for EMP	Rs. 10 Lakhs
	Cost for CER	2% of the total cost
	Ecological Sensitive Areas (National Park, Wild Life Sanctuary, Biosphere Reserve, Reserve/Protected Forest etc.) within 10 Km radius	There is no National Park, Wild Life Sanctuary, Biosphere Reserve, Reserve/ Protected Forest within 10 km radius.
	Nearest Town/ Major City with population	Jalpaiguri town, approx. 4.63 km.
	Nearest Railway Station	New Jalpaiguri Railway Station, approx. 34.83 km.
	Nearest National/State Highway	NH-717, Approx. 5.95 km towards NE. NH-27, Approx. 2.73 km towards N.
	Nearest Airport	Bagdogra Airport, approx. 45.72 km.
	Medical Facilities	Jalpaiguri Superspeciality Hospital, Approx. 4.96Km.
	Seismic Zone	Zone V
	Water Body	Teesta River (Riverbed)

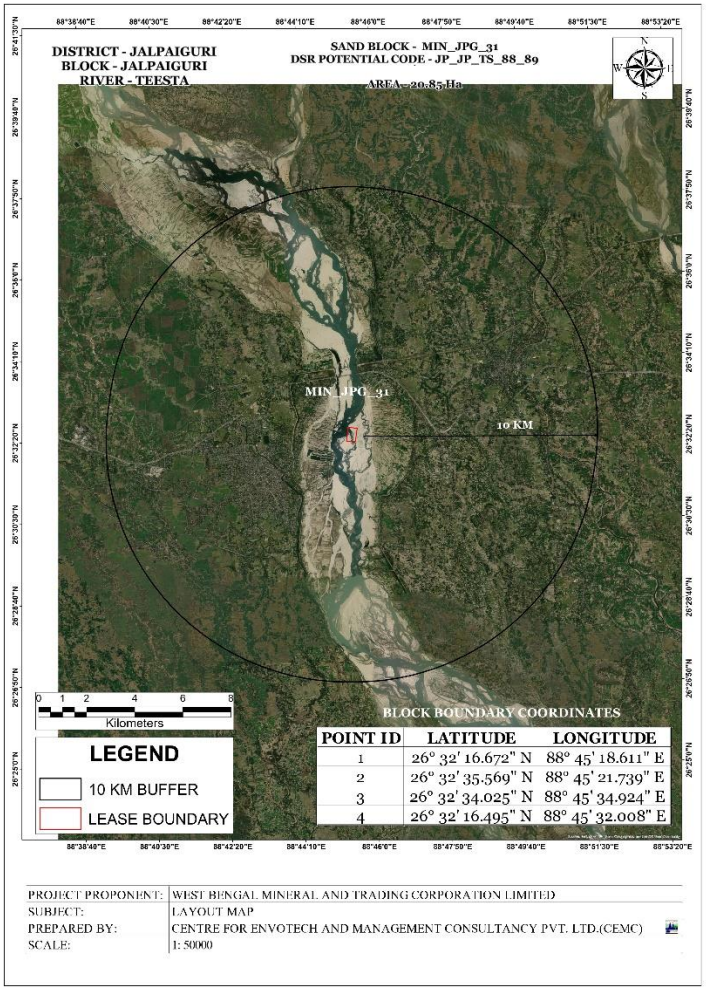


Figure No.C1-1. 10km Radius Layout Map

1.5 SCOPE OF THE STUDY

The scope of the study includes a detailed characterization near the Mine Lease Area for various environmental parameters like Ambient Air, Water, Noise, and Land, Biological and Socio-economic aspects.

1.6 TERMS OF REFERENCE

The project proposal was submitted to State Level Environment Impact Assessment Authority-West Bengal for its appraisal. Based on which, presentation was held on 28.06.2024 for Terms of Reference (TOR). Based on the data provided and presentation made, ToR of proposed Sand mining project has been issued by SEIAA, West Bengal vide (File no- EN/T-II-I/110/2024). The compliance of ToR is described below.

Table No.C1.1- COMPLIANCE FOR ToR

S.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.	Since this is a new project, this compliance is not applicable.
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 vide letter number 430-ICE-12011 (99)/27/2022-MINES SEC-Dept. of ICE by Mining department, West Bengal on dated 05.07.2023 is 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 Draft EIA being submitted are compatible with one another mentioning following information: Mining Lease Area- 20.85 Ha. Lessee: M/s. West Bengal Mineral Development and Trading Corporation Limited (WBMDTCL), Proposed Production- 233520 cum/year sand and 350280 cum/year pebbles and gravels. No mines waste will be generated as whole mined material is saleable. Small amount of domestic waste such as pouch, packets of some eatable items will be generated, will be managed by laborers itself as per existing lease. 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).	Toposheet No. of mining lease area is provided in EIA/EMP Report. Refer Chapter-1. The land-use of the study area with proper demarcated features is enclosed with the report, Land Use pattern& land use map is given in chapter 3, Refer Chapter-3.
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.	Land Use pattern & land use map is given in chapter 3, Refer Chapter-3.
6.	Details about the land proposed for mining activities should be given with information as to whether mining	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.

	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	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-6, Fig:- C6-1.

	to the Board of Directors of the Company and/or shareholders or stakeholders at large,may also be detailed in the EIA Report.	
8.	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	This is an open cast sand mining project. Mining will be done by opencast semi mechanized method without adoption of drilling & blasting.
9.	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.	The 10 km zone from periphery of the lease has been considered as the study area. The Buffer map of the study area is attached with report. No waste will be generated except small amount of municipal solid waste, which will be managed as per law. All the details in the EIA report are for the life of the mine period. Refer Chapter-2.
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	Land use pattern of 10 km from the periphery of the lease area is prepared and incorporated with the report. The study area lies on Teesta River. No, National parks or Wildlife Sanctuary is found within 10 km study area, Refer Chapter-3.

	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.	The proposed project lies on Teesta River and as such there is no over burden. No top-soil will be produced as waste material because all the excavated material will be saleable. There is no requirement of R& R Plan as it is a river bed sand mining project.
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	There is no forest land within the lease area.

	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.	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 recognition of forest rights under the Scheduled 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 detail of the study area is incorporated with the report, Refer Chapter-3.
16.	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.	The details impacts & there 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	There is no National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger / Elephant Reserves are present within 10 km study area. Refer Chapter-1

	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	The 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 is incorporated in the EIA/EMP report. Refer Chapter-3

	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 Department should be secured and furnished to the effect that the proposed mining activities could be considered.	There is no critically polluted or 'Aravali Range' nearby lease area.
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	There is no CRZ near lease area.

	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)	This is a Riverbed Mining Project. There are no inhabited areas in the allotted mine area which lies on the Teesta River, therefore no R&R Plan is proposed.

	located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.	
22.	One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season); December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind	Base line study was carried out for one Season (winter) from December 2023 to February 2024. Details are provided in Chapter-3 of EIA report. The locations of the monitoring stations were decided based on prevailing micro - meteorological conditions (Wind direction & wind speed) of the study area. The wind rose pattern is given in chapter-3 of EIA/EMP Report. The location of the monitoring sites is shown in map. Refer Chapter-3

	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	Air modelling has been provided as Annexure III. The wind rose showing pre-dominant wind direction is indicated in the EIA/EMP Report. Refer Chapter-3, Figure No.-C3-7.

	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.	The water requirement for the project is 21 KLD out of which 3.7 KLD for dust suppression and 7.3 KLD for use for domestic & drinking purpose and 10 KLD for plantation. A detailed water balance is provided in the report. Refer Chapter-2, Table-C2-4.
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 for drinking purpose and from nearest pond for dust suppression and green belt development. So, no clearance is required.
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.	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. No artificial rainwater harvesting is proposed for the present project in lease area.
27.	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.	Mining activity will be done on Dry Bed of River so there is no impact on surface water. 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.

28.	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken, and Report furnished. The Report inter-alia shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.	Mining will be up to 3 m below ground level or above the ground water table whichever comes first. This mining will not intersect the ground water table, as the ground water level in pre monsoon in 1.34-3.82 m bgl & in post monsoon it is 1.6-3.1 m bgl. Therefore, Hydro geological Report will not require for this project.
29.	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the	The project site lies on Teesta river. No diversion is proposed.

	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.	The elevation of the applied area for the block is 99 ASML to 106 AMSL 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 quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt	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 is incorporated in Chapter-9.

	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.	There will be about 64 trucks carrying the minerals per day. The projection has been done based on the mineral transportation. The details of traffic analysis are discussed in the report. Refer Chapter-4.

33.	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	A temporary rest shelter will be provided for the workers near to the site with provisions of water, first aid facility, protective equipment's, etc. Details are given in the EIA/EMP Report. Refer Chapter-2
34.	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.	The proposed mining is an opencast sand mining project, where sand will be naturally replenished during monsoon season, there is no feasibility of reclamation on dry riverbed.
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 air pollution due to fugitive dust emission because of movement of vehicles. However appropriate mitigation measures for air pollution control is given in the report, discussed in Chapter-9. Each labour will undergo pre-placement medical examination. Thereafter periodical heath checkup will be arranged as stated in the report. Refer Chapter-9, Table-C9.1 for budgetary allocation.
36.	Public health implications of the	The proposed project being a small scale semi-mechanized mining project, there will be hardly any

	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.	process related health implication on the population of the nearby villages except fugitive dust emissions due to transportation. Budgetary allocation is given in Chapter-9. However protective equipments will be provided & health camps & awareness programs will be arranged for them. Details are given in report. Refer Chapter-9.
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.	Socio-economic significance provided to the local community i.e., to the nearby villagers is given in the EIA/EMP Report, Refer. Chapter-9.
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.	The detailed environmental management plan to mitigate the environmental impacts is mentioned in of the EIA/EMP Report. Refer Chapter-9.

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.	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions shall be provided in the final EIA/EMP report.
40.	Details of litigation pending against the project, if any, with direction/order passed by any Court of Law against the Project should be given.	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.	The capital cost & the EMP cost is earmarked for EMP. Refer, Chapter-2. Table No. C2-7 & Chapter-9. Table No. C9-2
42.	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	A Disaster management is given in EIA report. Refer Chapter-7.
43.	Benefits of the Project if the Project is implemented should be spelt out. The benefits of	Benefits of the project is discussed in detail under Chapter -8. 2% of the capital cost of the project cost will be used as CER cost.

	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.	Executive Summary of the EIA/EMP Report (enclosed as **Annexure-A**).	Executive summary of the EIA/EMP Report shall be submitted in both draft and Final EIA report.
b.	All documents to be properly referenced with index and continuous page numbering.	All documents is properly referenced with index and continuous page numbering.
c.	Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.	The source and period of baseline data collection has been provided with respective sampling station.
d.	Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the project.	Details of testing reports of air, water, soil & noise have been enclosed in EIA report. Refer Chapter-3.
e.	Where the documents provided are in a	The documents is being provided is both native language and English language (Executive summary).

	language other than English, an English translation should be provided.	
f.	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	The Questionnaire shall be submitted along with Final EIA Report.
g.	While preparing the EIA report, the instruction 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 proponent and instructions for the consultants issued by MOEFCC vide O.M. No. J/11013/41/2006/- IA.II(I) dated 4th August, 2009 are being followed.
h.	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.	There will be no major changes in basic scope and project parameters from Form-1 & PFR. If any changes after PH, shall be incorporated in final EIA report.

	Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.	
i.	As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.	Since this is a new project, this compliance is not required.
j.	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	Surface plan cum geological section, geological has been incorporated in chapter 2 of EIA report.

	external dumps, if any, clearly showing the land features of the adjoining area.	
B.	**Additional Terms of Reference**	
a)	Means of access and egress between the embankment and the sand quarry may be clearly earmarked. The Project Proponent must commit that no hard toing or paving of any haulage route within the riverbed will be attempted.	The access and egress between embankment and quarry area is given in Annexure IV. There will be no hard toing or paving of any haulage route within the riverbed will be attempted.
b)	A plan on the management and handling of sand during the period of intermediate stockpiling should be submitted.	The management and handling plan of sand is enclosed as Annexure IV.
c)	A progressive Greenbelt Plan may be prepared. The project area being entirely on the riverbed, afforestation/ vegetation should be attempted alongside the village roads or other public land. This may be done with prior approval of the local self-governing bodies. If no public land	As per the prevailing norms, the Corporate Environment Responsibility (CER) budget is limited to 2% of the project cost to be incurred during the entire lease period of 5 years and WBMDTCL is committed to made this expenditure. Details of Committed expenditure on CER head shall be submitted to the Competent Authority as per compliance schedule. WBMDTCL is in desperate search for land required for Plantation outside the mining lease areas since entire sand mining blocks are part of River bed and having replenishable resources. However, in sand mining operation, the entire project area falls within the river

	is available for the purpose the Project Proponent shall arrange for land with his personal means. To enhance success/ survival rate the plantation shall be attempted during the first two years of the project life and the plantation so done shall be taken care of during the rest of the project life. Species of the plant selected should be self-sustaining in that particular region.	zone and it is not possible to undertake any plantation drive within the project area as applicable in case of other in-situ mining/ industry. The land outside the project area is the only option to go for the planation drive. But, non-availability of land for plantation is the major hurdle at field level to undertake this operation. In that case other departments like Land and Land Reforms, Irrigation and Waterways and Forest Departments have to be approached to provide the land parcels for this plantation drive. Upon availability of the Land for plantation, WBMDTCL hereby undertakes to take the plantation schemes as per the prevailing norms and guidelines as applicable for River bed mining.
d)	A need-based EMP may be prepared in accordance with the MoEF&CC Office Memorandum vide F.No. 22-65/2017.IA.III dated 30.09.2020. Record of communications made in this regard with the identified/intended beneficiaries (schools/institutions etc) may also be uploaded.	WBMDTCL is committed to make the expenses up to a maximum limit of 2% of the total project cost. WBMDTCL undertakes that, all the expenditure will be made in due consultation and recommendation of the district authorities. The main objective of this expenses shall be peripheral development and environment protection. An undertaking in this regard is being furnished in Annexure-V.
e)	A study report on base flow level measured at 5 points with date and supporting photographs	Study report on base flow level measured at 5 no. of points with date and supporting photographs will be submitted on periodical basis and also will be part of half yearly compliance report.

<table>
<tr><td></td><td>may be submitted. It should be committed that mining will be done at least 1m above the base flow level. Accordingly, if required, the excavation plan may also be revised.</td><td></td></tr>
<tr><td>f)</td><td>Management plan of haul road to the public road.</td><td>The road should be wide enough for two of the largest vehicles to pass safely. The selection of a maintenance program for mine haul roads should be based on the optimization of costs. The goal is to minimize total vehicle operating and road maintenance costs.</td></tr>
<tr><td>g)</td><td>Spatial year wise progressive plantation programme.</td><td>Plantation will be done along the safety zone area of the mine site.
Although a total of 8340 trees will be included in the the 5 years plantation programme along the safety zone but only during the 1st and 2nd year plantation will be done and maintenance shall be done for rest years.
The plant species which shall be grown are: Teak, Rosewood,Neem, Gamhar Dalbergia sissoo, Terminalia arjuna (Arjun), Toona ciliate, Acacia catechu (Khair), Acacia nilotica (Babool). Suitable nutrients may have to be added for proper growth of plants. The project proponent shall purchase healthy seedlings of desired numbers from the nearby nursery.
<u>Plantation Schedule for 1st and 2nd year</u>
<table>
<tr><th>Sl.No.</th><th>Year of Plantation</th><th>Plantation</th></tr>
<tr><td>1</td><td>I year</td><td>4170</td></tr>
<tr><td>2</td><td>II year</td><td>4170</td></tr>
<tr><td colspan="2">Total Plantation</td><td>8340</td></tr>
</table>
</td></tr>
</table>

Chapter-2

PROJECT DESCRIPTION

2.1 TYPE OF THE PROJECT

The proposed project is excavation of sand from riverbed of Teesta River. It is an opencast semi-mechanized mining project to excavate sand in its existing form.

2.2 NEED OF THE PROJECT

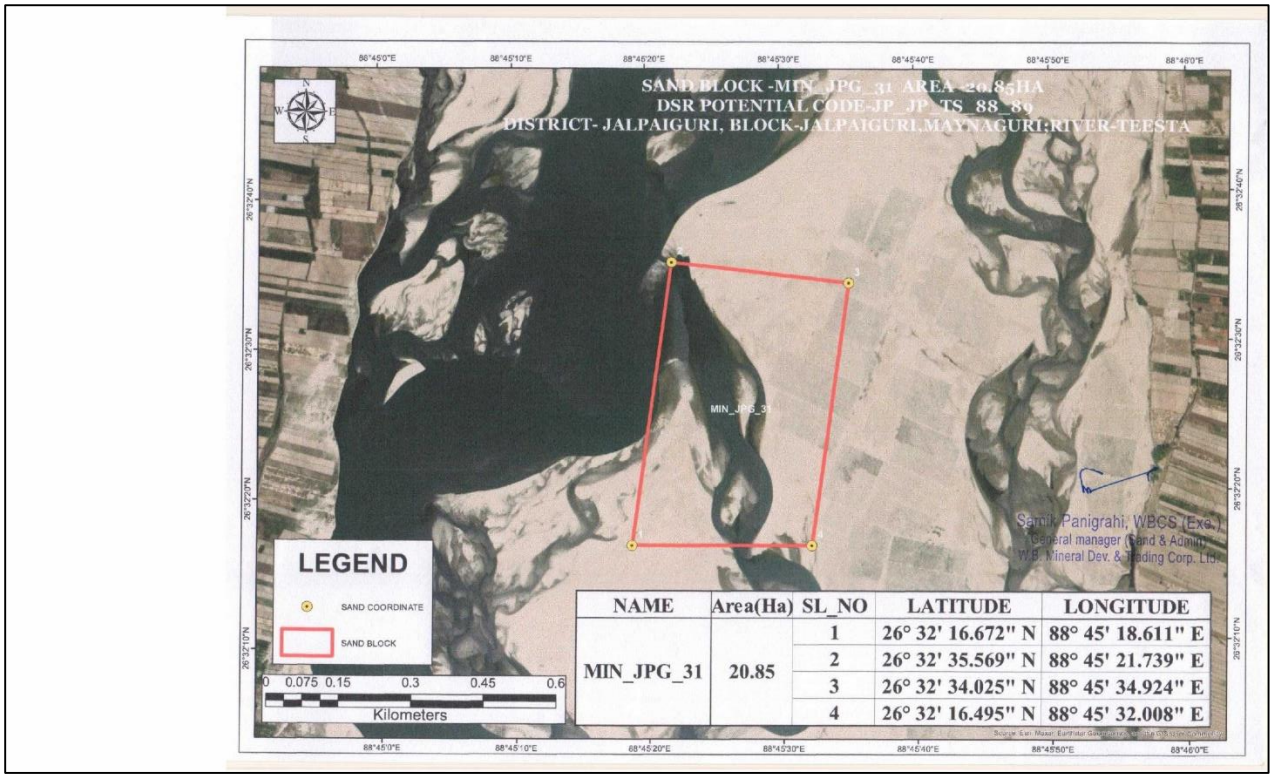
Building huge infrastructure such as road and housing sector requires basic construction raw materials in which sand is one of primary raw material required for the purpose. The mining activities as proposed are the backbone of all construction and infrastructure projects as the raw material for construction is made available only from such mining project. The sand to be excavated is in high demand at the local market for real estate and infrastructure industry. This project will also provide employment to local people helping them earn livelihood. In addition to this, it will further prevent widening of the above-mentioned rivers bed due to the deposition of sediments which if not mined out will result in raising of the river bed causing flooding, damage to the adjoining areas, destruction of life and property.

2.3 DESCRIPTION OF THE PROJECT

The proposed sand mining project at P.S.: Jalpaiguri, Block- Jalpaiguri, District: Jalpaiguri, West Bengal for production capacity of 233520 cum/year sand and 350280 cum/year pebbles and gravels over an area of 20.85 Ha (Fig. C.2.1).

Table No.C2-1 Location Details

<table>
<tr><td>Location</td><td>
<table>
<tr><th>Point ID</th><th>Latitude</th><th>Longitude</th></tr>
<tr><td>1</td><td>26° 32' 16.672" N</td><td>88° 45' 18.611" E</td></tr>
<tr><td>2</td><td>26° 32' 35.569" N</td><td>88° 45' 21.739" E</td></tr>
<tr><td>3</td><td>26° 32' 34.025" N</td><td>88° 45' 34.924" E</td></tr>
<tr><td>4</td><td>26° 32' 16.495" N</td><td>88° 45' 32.008" E</td></tr>
</table>
MIN_JPG_31 Sand Mine covers Teesta River bed deposit which is located at P.S.-Jalpaiguri, Block: Jalpaiguri, District: Jalpaiguri, State: West Bengal (Fig. C.2.2)
</td></tr>
<tr><td>Type</td><td>Sand and Pebbles and Gravels mining project, Category- B1</td></tr>
<tr><td>Area</td><td>20.85 Ha</td></tr>
<tr><td>Production Capacity</td><td>233520 cum/year sand and 350280 cum/year pebbles and gravels</td></tr>
<tr><td>Toposheet Number</td><td>G45K14</td></tr>
<tr><td>Nearest Settlements</td><td>Ulladabri</td></tr>
<tr><td>Nearest Highway</td><td>NH-27, Approx. 2.73 km.
NH-717, Approx. 5.95 km.</td></tr>
<tr><td>Nearest Railway Station</td><td>New Jalpaiguri Railway Station, approx. 34.83 km.</td></tr>
<tr><td>Nearest Airport</td><td>Bagdogra Airport, approx. 45.72km.</td></tr>
<tr><td>Nearest River</td><td>Teesta river</td></tr>
</table>



NAME	Area(Ha)	SL_NO	LATITUDE	LONGITUDE
MIN_JPG_31	20.85	1	26° 32' 16.672" N	88° 45' 18.611" E
		2	26° 32' 35.569" N	88° 45' 21.739" E
		3	26° 32' 34.025" N	88° 45' 34.924" E
		4	26° 32' 16.495" N	88° 45' 32.008" E

Figure No.C2-1 Mining Lease Plan Map

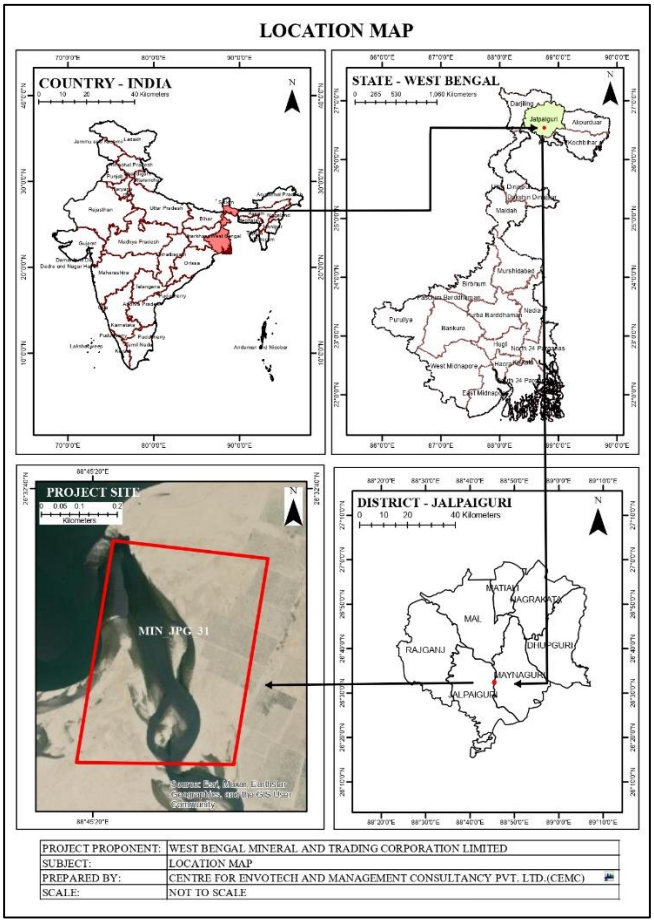


Figure No.C2-2 Location Map of the Project Site

2.4 GEOLOGICAL PROFILE OF THE AREA

2.4.1 Physiography

The western part of Alipurduar-Jalpaiguri region is slightly undulating and covered by paddy fields and bushy jungles, while the eastern part of the district presents a flat strip of land. There are numerous rivers in the district and except the Torsa, which originates from Tibet, all others originate from Sikkim, Bhutan and Darjeeling hills and drain north-southern part of the district. The whole region is full of tea gardens and scatter forests. The entire topography is crisscrossed with streams, rivers and hills. The district topography wears a mixed look consisting both of hilly areas and undulating plains coupled with vast flat plains. Three district physiographic units can be identified in the district (a) the northern hilly terrain which is a part of the sub-Himalayan Ranges, (b) the central tract, locally called Bhaber and (c) the gently sloping alluvial plain in the south

locally called Terai *(Census, 2011)*.

A few hills occur in the Terai or Dooars region at the foot of the Himalayas. Some remnants of the Siwaliks can be seen in the region. The "Terai" ("moist land") is a belt of marshy grasslands, savannas, and forests at the base of the Himalaya range stretching southwards to about 38 km. Above the Terai belt lies the Bhabar, a forested belt of rock, gravel, and soil eroded from the Himalayas. North Bengal plains start from the south of Terai region and continue up to the left bank of the Ganges.

2.4.2 Geology

Chotanagpur Gneissic Complex and moving further east, Gondwana Super Group with Inconformity with the general geological setting in the Himalayan tract of North Bengal, the foothill belt comprises the Siwaliks in the south, separated from the impersistent Gondwana rocks attain maximum thickness here, and is best developed in the whole North Bengal. It follows the Gondwana in the north, forming the southern flank of the Dalings, which becomes the prominent rock unit in Bhutan. Among the Quaternary Geological formations of Eastern India, this study area has involved polycyclic landscape and peculiar drainage system, being reconstructed from time to time.

The stratigraphic succession is furnished in Table C4-1.

Table C2-2: The generalized stratigraphic succession of Jalpaiguri (After GSI, 2001)

Group Name	Lithology Type
Older Alluvium (Pleistocene to Recent)	Loose sandy soil with boulders and pebbles of older rocks.
Siwalik Group (Mio-Pliocene)	Coarse grained, Micaceous, sub-greywacke with pallets of clay and lenses of lignite. Stratigraphically upper members are usually pebbly and relatively more felspathic.
Main Boundary Fault	
Gondwana Group	Lamprophyres and quartz veins. Tectonically mixed, boudinaged quartzite sandstone with crushed carbonaceous material. Original bedding form usually obliterated.
Thrust contact	
Epidiorite	Mostly occurring as sills.
Buxa Series (Precambrian)	Dolomite and orthoquartzite with variagated Phyllites.

Group Name	Lithology Type
Thrust contact	
Daling Series (Archaean)	Thick pure quartzite beds interblended with thick grey phyllite, bluish grey phyllite and schist.

2.4.3 Soil types

The soil types are mostly clayey-loam, loam, sandy loam, acidic pH ranges from 4.5 to 6.6 and deficient in micronutrients. The soil in this region varies from alluvial soil to sandy and hard black clayey. The upper region in the north of Dooars, the soil is mainly black and clayey. This soil is suitable for growing tea, which is a major cash crop of this district. In the lower plain, the soil consists of a mixture of both clay and sand.

2.4.4 Drainage

A large of number of rivers and rivulets originate from the hilly areas of adjacent Bhutan and there is a network of rivers cross-crossing the entire region. The major rivers are Teesta, Jaldhaka and Angabarsha. The rivers often overflow their banks depositing layers of fertile soil on the banks on either side.

A Drainage map has been prepared and furnished below in figure no. C2-3.

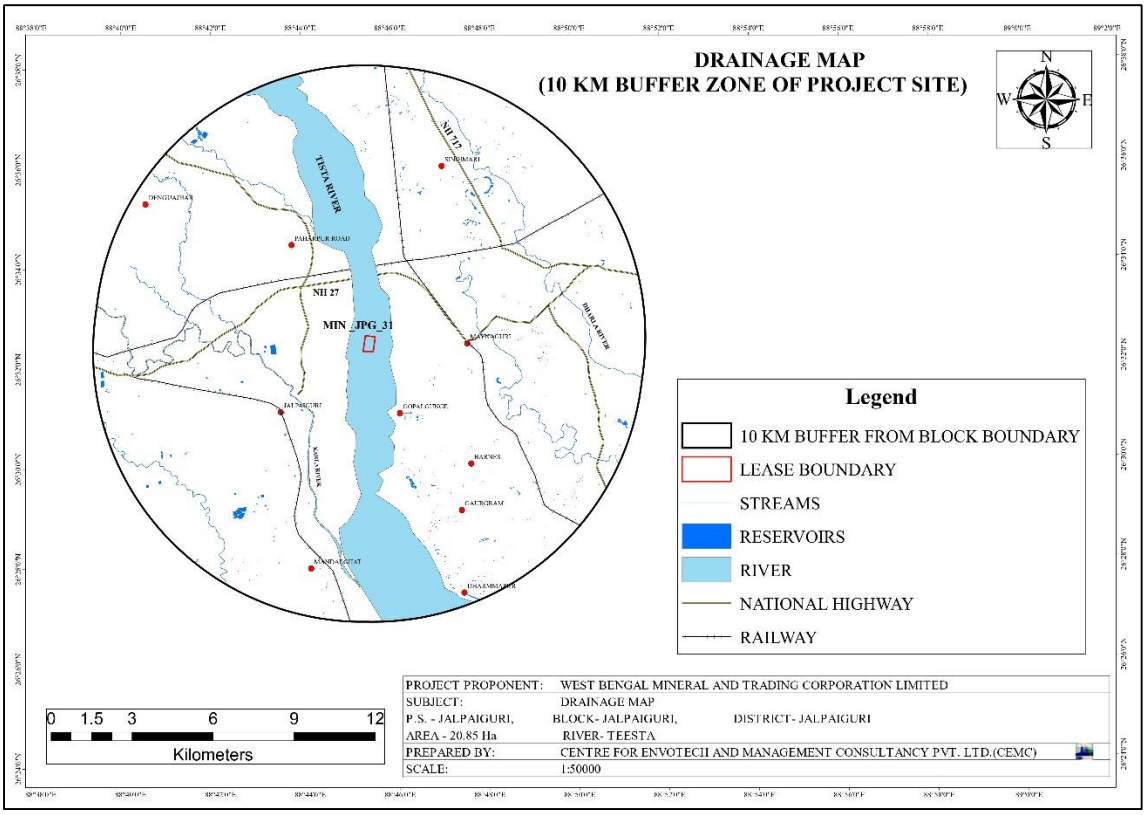


Figure No.C2-3 Drainage map of 10 km buffer of project site MIN_JPG_31, Jalpaiguri.

2.4.5 Climate & rainfall

Jalpaiguri is part of monsoon climate zone of South-Eastern Asia. July (sometimes August) is the hottest month of this region with average maximum temperature of about 29°C whereas January is coldest with 14°C. Highest ever recorded maximum and minimum temperature are 41.3°C and 2.1°C in Jalpaiguri city. The average annual humidity in the district is of 82%. The annual average rainfall is 3360 mm. January is the driest month with average rainfall 9 mm and July is wettest with 818 mm.

2.5 SEISMICITY OF THE AREA

The state of West Bengal 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. The mine lease area is in seismic **Zone V**. This region classified as the **High Damage Risk Zone.**

2.6 AVAILABLE RESERVES AND PRODUCTION

2.6.1 Geological Reserve

The proposed project is of riverbed mining project, so entire deposit is in the riverbed. The measurement of the Geological reserve is estimated by the actual measurement of average mineable area of the Lease area by multiplying with the thickness of available sand deposit i.e. 3 meter. All the quantity estimated under proved (111) category under UNFC, 2012. Safety zone of 7.5 meter has been calculated from the excavation zone and excluded from the reserve estimation process.

2.6.2 Mineable Reserve

The peak rated production is 233520 Cum/year for Sand and 350280 Cum/Year for Pebbles and Gravels up to the lease period as geological mineral reserves is 2602080 Cum.

Table No. C2-3 Calculation of Mineable area of MIN_JPG_31 sand mine

Total Area (Ha)	Safety Zone (Ha)	Average Mineable Area (Ha)	Thickness (m)
20.85	1.39	19.46	3

Table No. C2-4 Geological Resource of MIN_JPG_31 Sand mine

Year	Total Area (Ha)	Thickness (m)	Replenishment Rate (%)	Geological Resource (Cum)
1	20.85	3	100	625500
2	20.85	2.37	79	494145
3	20.85	2.37	79	494145
4	20.85	2.37	79	494145
5	20.85	2.37	79	494145
Total Geological Resource				**2602080**

Table No. C2-5 Mineable Reserve/Annual Production of MIN_JPG_31 Sand mine

Year	Average Mineable Area (Ha)	Thickness (m)	Replenishment rate (%)	Mineable Reserve (Cum)	Annual Production (Cum)
1 (2024-2025)	20.85	3	100	583800	583800
2 (2025-2026)	20.85	2.37	79	461202	461202
3 (2026-2027)	20.85	2.37	79	461202	461202
4 (2027-2028)	20.85	2.37	79	461202	461202
5 (2028-2029)	20.85	2.37	79	461202	461202
Total Mineable Reserve				**2428608**	**2428608**

Table No. C2-6 Production details for boulder, gravel/pebble and sand for mining

Year	Mineable Reserve (Cum)	Presence of pebbles/gravels (%)	Volume of reserve for pebbles/ gravels (cum)	Reserve for sand (cum)
1 (2024-2025)	583800	60	350280	233520
2 (2025-2026)	461202	60	276721.20	184480.80
3 (2026-2027)	461202	60	276721.20	184480.80
4 (2027-2028)	461202	60	276721.20	184480.80
5 (2028-2029)	461202	60	276721.20	184480.80
TOTAL	**2428608**		**1457164.8**	**971443.20**

2.6.3 Life of the mine

The mining lease grant order has been issued for 20 years, however this mining plan is prepared for 5 years and reviewed in every 5 years as per provision of WBMMCR, 2016. Since sand is replenishable resources replenishment study will be reviewed and this mine plan including mine closure plan will be modified resource statement.

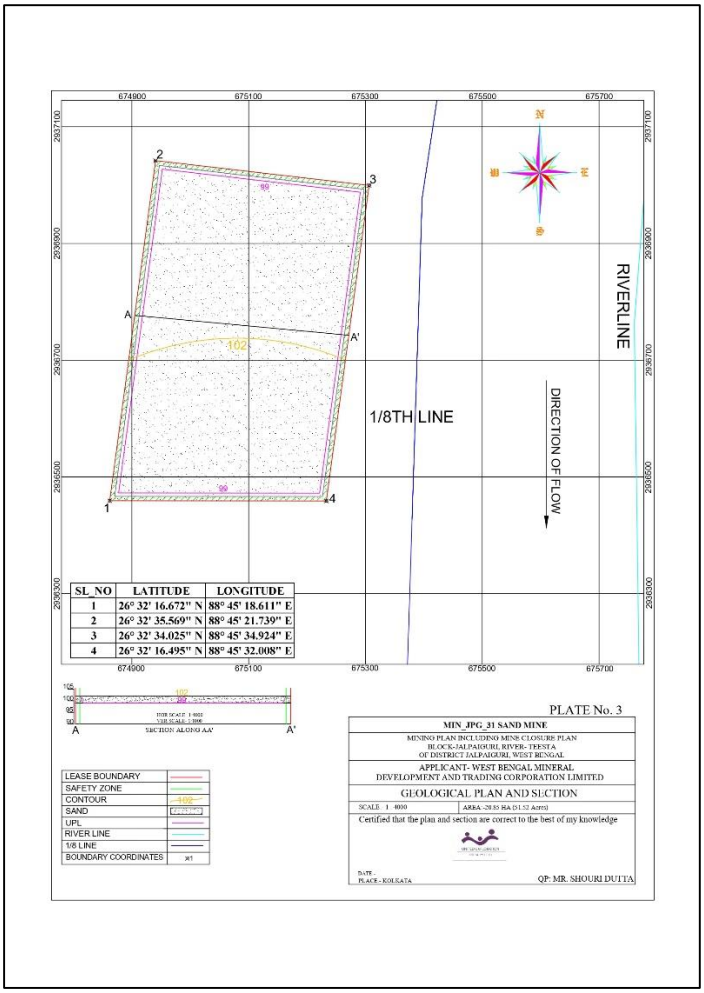


Figure No.C2-4 Geological Plan & Section

2.7 METHOD OF MINING

Mining will be carried out in opencast strip-mining method through light machineries such as Backhoe Loaders, excavators and tippers or also through manual mining methodology. No drilling & blasting will be required. Excavation of sand will be done mechanically using front end loaders, front-end loaders with backhoe etc. There will be a single bench operation with 3-meter in one meter slice. Safety barrier of 7.5 meter from the lease boundary will be considered and shall remain untouched.

2.7.1 Conceptual Plan of Mining

The longitudinal section of the river channel is explained in the Figure C2.5 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.

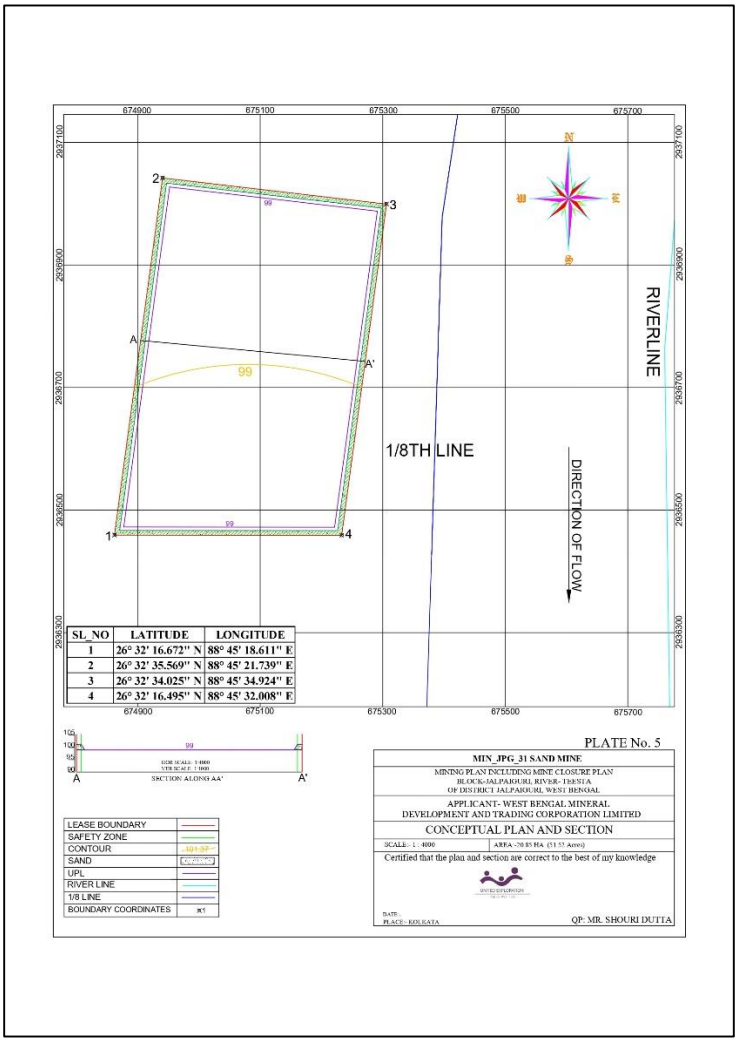


Figure No.C2-5 Conceptual Plan of MIN_JPG_31

2.7.2 Machineries

Mining will be carried out through semi mechanized open cast mining methodology with deployment of light mining machineries. An estimated no. of machineries is provided in table No. C2-7.

Table No. C2-7 Machineries

Sl. No.	**Machinery**	**Numbers**	**Fuel consumption per hour (Ltrs) per machine**
1.	Excavator(JCB/Shovel) 1.0 – 1.2 cum	3	12
2.	Tipper (10 ton)	10	7
3.	Sprinkler 4KL	3	4
Total		**16**	**23**

2.8 TRANSPORTATION OF MINERALS

Mineral Sand will be transported by trucks. Loaded trucks will travel on kuccha road made for plying of trucks. The temporary road will provide access to the riverbed 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 topsoil/clay layer to be preserved elsewhere during the mining operations. The sand deposits are being a part and parcel of river system. There is no disposal. The proposed project is the mining of sand from dry part of riverbed, therefore no mines reject will be generated.

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.

2.11 UTILITIES AND PROPOSED SITE FACILITIES

2.11.1 Water Requirement

Total water requirement in MIN_JPG_31 is estimated to be 21 KLD. This water will be supplied by private tankers. Water required for sprinkling and plantation purpose shall be collected from the nearby village.

The details of water uses are given below:

Table C2-8: Water Requirement

Purpose	Water used (KL)
Drinking and domestic purpose	7.3
Dust suppressor and other	3.7
Green belt development	10
Total	**21**

2.11.2 Power supply

All the activities will be carried out in manual and semi-mechanized manner. The material will be excavated and loaded directly into tractors /trolleys by the workers themselves. The operation may be done after sunset, so the required electricity will be applied through generator.

2.11.3 Manpower

The manpower requirement for the proposed project will be around 54.

The following manpower will be engaged during mining operations as furnished in Table No. C2-9.

Table No. C2-9 Manpower requirement

Sl. No.	Manpower	Numbers
1.	Operators for excavator and dumpers	20
2.	Helper	15
3.	Labour	10
4.	Supervisor	2
5.	Transport Manager	2
6.	Accounts	1
7.	Security	4
Total		**54**

2.11.4 Social Infrastructure Available

a) Medical

The nearby Jalpaiguri Superspeciality hospital is situated at Jalpaiguri district, 4.96 km away from the lease area towards western direction.

b) Rest Shelter

A temporary rest shelter will be available at the mine site.

c) Mine Office

Temporary mine office is proposed at the applied lease area.

d) Latrines and Urinals

At the mine site, temporary urinals and latrines shall be provided for the workers

2.12 PROJECT COST

Capital cost for the project is Rs. 22,53,37,716/-

Table No. C2-10 Project cost

Sl No.	Description	Amount
1	Premium Charges	21,64,74,966/- (Rs-10.5/cft)
2	Financial assurance	3,12,750 /-
3	HEMM	58,00,000/-
4	Monsoon Preparation	4,00,000/-
5	CCTV, GPS Tracker for monitoring Transportation	10,00,000/-
6	Environmental safe guarding	7,50,000/-
7	Miscellaneous	5,00,000/-
Total		**22,53,37,716/-**

Chapter-3

DESCRIPTION OF ENVIRONMENT

3.1 STUDY AREA

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 winter season (December, 2023 to February, 2024) by CEMC Private Limited, India (NABL Accredited Lab, Certificate No. TC-13501). Team of Experts visited the study area for Social & Biological Environment study. The following data, through field survey and other sources, was collected by CEMC Private Limited, for preparing the EIA/EMP for the proposed mining area with related facilities.

3.2 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.

3.2.1 Landuse landcover classification & Interpretation: The classification approach is applied based on 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-C3-1.

The unsupervised classification approach was obtained for the landuse and landcover classification by using ArcGIS 10.8 version software. In this approach, the pixels of the project area are clustered in several classes based on spatial & spectral variation in pixel value which are following:

1. **Settlement or Built-up land:** 19.81 percent of the total project area is covered by settlement or built-up land. The entire built-up land comes under rural areas. This area is identified by pink color 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.

2. **Cultivated land:** 68.55 percent of the total project area is covered under agricultural land or cultivated area. Agricultural land may be defined as the land that is used primarily for the production of food and fiber. In the imageries, cropland is identified by yellow color.
3. **River & Water Bodies**: All natural and man-made ponds, reservoirs, river come under this class. A river is a natural flowing watercourse, usually freshwater, flowing towards an ocean, sea, lake or another river. In some cases, a river flows into the ground and becomes dry at the end of its course without reaching another body of water. This feature is identified by light to dark blue color and cover only 11.57 percent of the total project area.
4. **Lease area**: Lease area is the specified site for the project, which covers 0.06 percent of the total project area. This area is identified by red color boundary in the image.

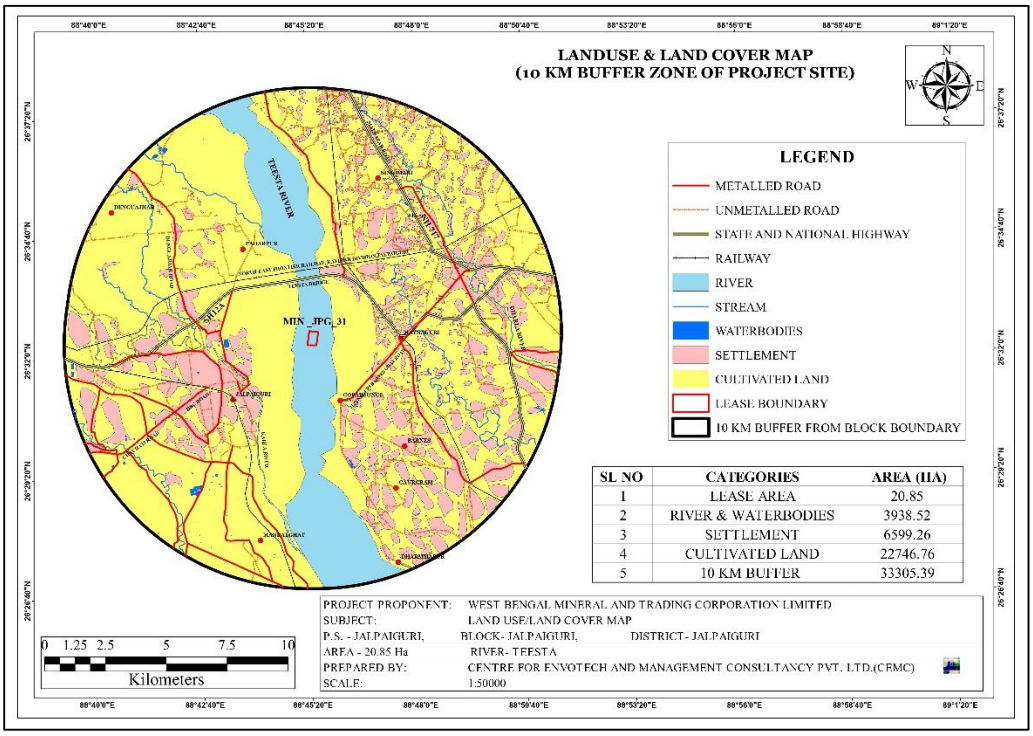


Figure No.C3-1 Landuse Landcover Classification

Based on the landuse landcover classification, the area of different land features are as follows (Table C3.1).

Table No.C3-1 Land use distribution

Class Name	**Area (Ha)**	**Area (%)**
Lease area	20.85	0.06
Settlement/Built-up land	6599.26	19.81
Cultivated area/ Agricultural land	22832.77	68.55
River & Water Bodies	3852.51	11.57
Total	33305.39015	100

3.3 SOIL SAMPLING

The baseline study covers collection of soil samples and determining relevant physical and chemical properties.

3.3.1 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 3 locations as shown in figure no. C3-2, Table no. C.3.2. Samples were analyzed as per CPCB guidelines.

Table No.C3-2 Soil Quality Monitoring Locations

SITE	**LOCATION**	**DISTANCE**
SQ1	Towards North East from the mine site	2.2
SQ2	Towards North West from the mine site	2.36
SQ3	Towards South East from the mine site	2.78

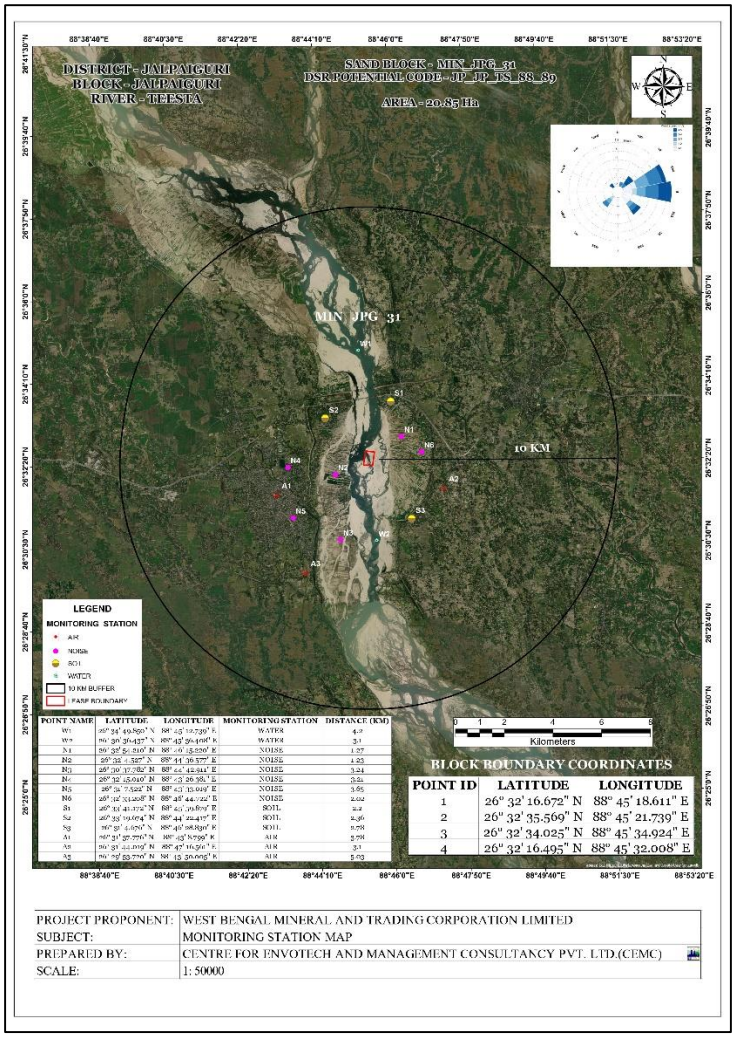


Figure No. C3-2 Map Showing the Monitoring Locations of Soil, Water, Air & Noise

Table No.C3-3 Sampling Data

		Location	**SQ1**	**SQ2**	**SQ3**
S. No.	**Parameter**	**Unit**	**Result**	**Result**	**Result**
1	pH	-	6.98	6.84	7.03
2	Conductivity	µmhos/cm	568.00	436.00	346.00
3	Sodium (as Na)	mg/kg	126.5	124	138
4	Water holding capacity	%	37.2	34.7	30.5
5	Potassium (as K)	mg/kg	93	94	104

6	Sand	%	64.00	48.00	68.00
7	Clay	%	30.00	38.00	19.00
8	Silt	%	6.00	14.00	13.00
9	Calcium (as Ca)	mg/kg	279.2	228.4	248.4
10	Magnesium (as Mg)	mg/kg	168	154	155
11	SAR	-	2.79	2.38	2.56
12	CEC	meq/100gm	16.36	20.48	14.52
13	Phosphorus (as P)	mg/kg	36	36	35
14	Organic carbon	%	0.63	0.54	0.77
15	Porosity	%	22.07	25.00	24.00
16	Permeability	cm/hr	1.84	1.77	1.73
17	Bulk Density	kg/cm^3	1.27	1.34	1.54
18	Total Kjeldahl Nitrogen (TKN)	%	0.02	0.024	0.028

3.3.2 Results

Samples collected from identified locations indicate pH value of 6.98, 6.84 & 7.03, which shows that the soil is slightly alkaline in nature. Organic carbon ranges from 0.54% to 0.77 % in the soil samples and, whereas the Potassium is found to be ranging from 93 mg/kg, 94 mg/kg & 104 mg/kg (Table no. C.3.3).

3.4 WATER ENVIRONMENT

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 surface water body falling within the study area. Surface water samples are collected from locations as shown in Figure No. C3.2.

3.4.1 Methodology

Perennial source of Surface water in the study area is Teesta River which flow towards Southeast direction. Samples were collected from upstream and downstream areas near the project site.

Sampling locations for surface water quality have been finalized and shown in Table C3-4, Figure C3-2.

3.4.2 Surface water

The surface water parameters have been analyzed as per APHA procedure and compared with CPCB water quality criteria mentioned in Table and the Surface water sample results are mentioned in Table No. C3-4.

Table No. C3-4 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 6 mg/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

Table No. C3-5 Water Quality Monitoring Locations

SITE	LOCATION	DISTANCE
SW1	Towards North from the mine site	4.2
SW2	Towards South from the mine site	3.1

Table No. C3-6 Sampling Data

S. No	Parameter	Test Method	Units	SW1	SW2
1.	pH (at 25°C)	IS:3025(Part-11)	---	7.1	6.90
2.	Temperature	IS:3025(Part-9)	°C	22.0	23.0
3.	Turbidity	IS:3025(Part-10)	NTU	6.3	5.7
4.	Electric Conductivity @25°C	IS:3025(Part-14)	µS/cm	189	176
5.	Sulphate (SO_4)	IS:3025(Part-24)	mg/l	3.2	4.1
6.	Nitrate (NO_3)	IS:3025(Part-34)	mg/l	2.98	1.1
7.	Total Hardness (as CaCO3)	IS:3025(Part-21)	mg/l	78	82
8.	Chloride (as Cl)	IS:3025(Part-32)	mg/l	24.3	25.8
9.	Fluoride (as F)	APHA 4500F	mg/l	0.2	0.23
10.	COD (as O_2)	APHA-5220 B	mg/l	16.5	17.2
11.	Iron (as Fe)	IS:3025(Part-53)	mg/l	0.2	0.13
12.	Dissolve Oxygen	IS-3025(Part-38)	mg/l	5.2	5.4
13.	Total Dissolved Solid	IS:3025(Part-16)	mg/l	198	194
14.	BOD (3 days at 27°C)	IS:3025 (P-44)	mg/l	4.2	4.6

15.	Calcium (as Ca)	IS:3025(Part-40)	mg/l	65	61
16.	Magnesium (as Mg)	IS:3025(Part-46)	mg/l	17	14
17.	Arsenic (as As)	IS:3025(Part-37)	mg/l	BDL (<0.01)	BDL (<0.01)
18.	Lead (as Pb)	IS:3025(Part-47)	mg/l	BDL (<0.01)	BDL (<0.01)
19.	Copper (as Cu)	IS:3025(Part-42)	mg/l	BDL (<0.05)	BDL (<0.05)
20.	Zinc (as Zn)	IS:3025(Part-49)	mg/l	BDL (<0.01)	BDL (<0.01)
21.	Manganese (as Mn)	IS:3025(Part-59)	mg/l	BDL (<0.10)	BDL (<0.10)
22.	Total Chromium (as Cr)	IS:3025(Part-52)	mg/l	BDL (<0.05)	BDL (<0.05)
23.	Sodium (as Na)	IS:3025(Part-45)	mg/l	23.5	56.0
24.	Potassium (as K)	IS:3025(Part-45)	mg/l	1.80	4.8
25.	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	mg/l	156	210
26.	Phosphate (as P)	IS:3025(Part-31)	mg/l	0.25	0.35
27	Nitrite (as NO_2)	IS:3025(Part-34)	mg/l	1.1	1.3
28.	Total Suspended Solid	IS:3025(Part-17)	mg/l	10.8	14.5
29.	Faecal Coliform	IS-1622	MPN/100 ml	1.2×10^3	1.5×10^3
30.	Total Coliform	IS-1622	MPN/100 ml	1.1×10^3	1.3×10^3

3.4.3 Results:

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 BDU Criteria of CPCB for its suitability for wild life and fisheries.

3.5 AIR ENVIRONMENT

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 3.7. Ambient air quality monitoring stations were selected primarily based on surface influence, demographic influence and meteorological influence. 24 hourly monitoring was carried out for SO_2, NO_2, PM_{10} & $PM_{2.5}$ twice a week at each station. This study was done during pre-monsoon season for a period of 3 months from December, 2023 to February 2024. The analysis reports are appended below in the Table-C3.7.

Table No. C3-7 Site-specific meteorological data

Month	**Wind Speed (km/h)**	**Temperature (°C)**			**Rainfall (mm)**
	Avg	Max	Min	Avg.	No. of rainyDays
December, 2023	14.2	18.2	10.9	25.5	-
January, 2024	14.9	16.6	9.7	23.6	-
February, 2024	14.5	18.9	11.8	26	-

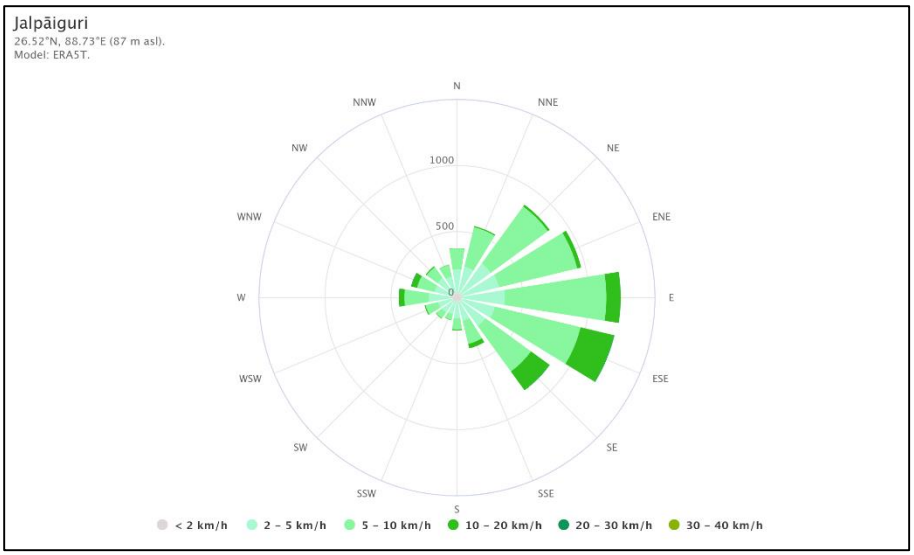


Figure No. C3-3: Wind Rose Pattern

3.5.1 Observation

The prominent seasonal wind direction is E, ESE, & SE contributing to its major portion (Fig.C.3.3).

3.5.2 Methodology

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

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. Three monitoring stations have been selected to assess the Air quality in study area.

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. 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, six monitoring locations were identified as shown in Table C3.8 and Figure C3-2. CPCB guidelines for the measurement of ambient air quality on 24 hourly monitoring was carried out for SO2, NO2, PM2.5 & PM10 twice a week at each station for a study period of 3 months (December 2023 to February 2024).

Table No.C3-8 Ambient air monitoring location

SITE	Location	Distance
AQ1	Towards North west from the project site	3.78
AQ2	Towards East from the project site	3.1
AQ3	Towards South West from the project site	5.03

Table No.C3-9 Sampling Data

Parameter	PM2.5(µg/m3)	PM10(µg/m3)	SO2(µg/m3)	NO2(µg/m3)
AAQM Norms	60	100	80	80
AQ1				
MIN	32.2	70	5.9	15.5
MAX	47.9	84.8	7.4	23.7
AVG	38.9	75.6	6.2	21.6
98 Percentile	42.17	82.8	7.1	23.1
AQ2				
MIN	30.5	77.7	6.6	10.2
MAX	44.3	85.5	8.6	13.6
AVG	37.2	68.08	7.02	11.5
98 Percentile	40.12	84.32	7.8	17.6
AQ3				
MIN	37.85	58.9	5.0	10.8
MAX	43.98	76.34	6.8	12.7
AVG	39.78	60.63	5.4	9.4
98 Percentile	42.35	70.96	5.56	10.5

3.4.3 Results:

The ambient air quality study for the 3 AAQ monitoring stations (Table C.3.9) shows that the maximum and minimum ground level concentration for PM10 is respectively 84.8 µg/m3 at AQ1 and 58.9 µg/m3 at AQ3. Whereas the maximum and minimum ground level concentration for PM2.5 ranges between 47.9 µg/m3 at AQ1 and 30.5 µg/m3 at AQ3, respectively. Similarly, for SO2, the maximum and minimum ground level concentration varies between 8.6 µg/m3 and 5.0 µg/m3 for respectively AQ2 and AQ3 stations. For NO2 the maximum and minimum ground level concentration varies between 23.7 µg/m3 & 10.2 µg/m3 for respectively AQ1 and AQ2 stations showing variable range of distribution.

3.6 NOISE ENVIRONMENT

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.

3.6.1 Methodology

The proposed project activity is expected to affect ambient noise quality in the surrounding areas. Therefore, the choice of monitoring locations is based on human habitation factors. Table C3-10 and Figure C3-2 shows noise quality monitoring locations.

Table No.C3-10 Noise Quality Monitoring Station

SITE	Location	Distance
NQ1	Towards North from project site	1.27
NQ2	Towards East from project site	1.23
NQ3	At the project site	3.24
NQ4	Towards South from project site	3.21
NQ5	Towards West from project site	3.65
NQ6	Towards North west from project site	2.02

Table No. C3- 11 Sampling Data

Sl. No.	Location	Result		Unit
		Day	Night	
1	NQ1	50.8	42.6	dB(A)
2	NQ2	57.8	50.2	dB(A)
3	NQ3	50.1	44.8	dB(A)
4	NQ4	49.5	52.8	dB(A)
5	NQ5	54.9	43.6	dB(A)
6	NQ6	55.4	45.1	dB(A)
Requirement (as per CPCB Guidelines Limits in dB (A) Leq				
Category of Area/ Zone		**Day time**	**Night time**	
Industrial Area		75	70	
Residential Area		55	45	
Commercial Area		65	55	
Silence Zone		50	40	

3.6.2 Results:

Noise monitoring study reveals that the minimum & maximum noise levels at day time were recorded as 49.5 dB (A) at NQ4 & 57.8 dB (A) at NQ2. The minimum & maximum noise levels at night time were found to be 42.6 dB (A) at NQ1 & 52.8 dB (A) at NQ4 (Table C.3.11).

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.

3.7 BIOLOGICAL ENVIRONMENT

The biological environment is very crucial for living environment of any area. The Biological diversity includes the variation of all of life forms mainly genetic, species and population. However, Flora and Fauna diversity is broadly understood type. They are further divided into terrestrial and aquatic life form. Forests are repository of the biodiversity, 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. In India, the sustained flow of water in our rivers, streams and rivulets and recharge of ground water is necessary for the food security and drinking water availability. 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.

3.7.1 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.

3.7.1.1 National Park, Wildlife Sanctuary, Notified Forest, Ecologically Sensitive area and critically polluted areas in study area:

There is no national park, wildlife sanctuary and critically polluted area in 10km radius from the project site.

3.7.1.2 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 non-forest area are Champ, Gab (Mangosteen), Gamhari (White Teak), Ghorabadam, Pitali (L. Mudilflora), Jhau (She-oak), Khair (Cutch), Madar (the coral tree), Mahua (Mohwa, Butter), Nim (Margosa), Pakur (L. Ficus infectoria), Palas (L.ButeaFrondosa), Pipal (Long Pepper), Panisaj, Sal (L. Shorearobusta), Simul (Silk Cotton), Siris (Silk Flower), Sajna (Horse-Reddish, Kitchen plant), Sissu (Sisso), Tal (Palmyra-palm), Tentool (Tamarind), Toon (Toon) etc. Amongst these the Sal, Sissu and Khair are used in the manufacture of agricultural implements, house buildings and wooden furniture. Vernacular names of some of the well-heard fruit trees are Aam (Mango), Anaras (Pine Apple), Alu (Potato), Ata (Custard Apple), Bel (Wood Apple), Chalta (an idible acid fruit tree), Dalim (Pomegranate), Golapjam (Rose Apple),respectively.

3.7.1.3 Faunal Biodiversity

The fauna visiting core zone includes monkeys (Prebytis entellus), snakes (Trimeresurus gramineas, Dryophis nasutus), crows (Corvus splendens) etc. As per the information collected by the field team, the common animals of the study area are toad (Duttaphrynus melanostictus) and frog (Hoplobatrachus tigerinus), Indian garden lizards (Calotes versicolor), House lizards (Hemidactylus frenatus). In addition, the commonly found domestic animals such as cow, dog, cat etc. and lower life forms, such as, boar, gaur, 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 jocosus), Pigeon (Columba livia), and Koel (Eudynamys scolopaceus).

3.7.1.4 Aquatic life: Along its course river Teesta support aquatic habitat. Species fishes like Punti, Carp, Catfish, Tilapia etc, Phytoplanktons like Cyclotella, Naviculla, Oscillatoria, Scenedesmus are found & Zooplanktons like Cyclops, Daphnia, Brachionus are found in river.

3.8 SOCIO-ECONOMIC ENVIRONMENT

The study area of Proposed Sand Mining Project of Area 20.85 Ha comes under Block: Jalpaiguri, District: Jalpaiguri, State- West Bengal. The study area involves 161 rural villages. There are no urban areas in the study area.

3.8.1 Methodology

The details of the activities and population structure have been obtained from Census 2011 and analyzed.

3.8.2 Results

Table No. C3-12 Demographic Profile of the Block in the study area

S. No.	Demographic Feature	Population
1	Total Population	3,23,445
2	Male	1,66,036
3	Female	1,57,409

*Source: Census of India 2011.

There is more than 30 villages in the Jalpaiguri block.

a) Demographic Composition

According to Census 2011, Core zone doesn't have any human habitation and 10km buffer have the total population of 3,23,445 individuals only (Table C3.12 and C3.13).

Table No.C3-14 Demography of Study Area, District Jalpaiguri, West Bengal, India

S. No.	Item	Number of Individuals	%	Number of Individuals	%	Number of Individuals	%	Number of Individuals	%
1	Name of area	**Study area**		**Jalpaiguri District**		**West Bengal**		**India**	
4	Total Population	3,23,445		19,85,600		91,276,115		1.2×10^9	
5	Total Male Population	1,66,036	51.33	10,15,890	51.16	46,809,027	51.28	6.2×10^8	52
6	Total Female Population	1,57,409	48.6	9,69,710	48.9	44,467,088	48.71	5.9×10^8	48

*Source: Census of India 2011

b) Comparison: The total population clears that study area is having total population very less than district population due to less population density. The total literacy rate of the block area is 64.9%.

c) Social Infrastructure Available:

The Proposed Sand Mining Project of Area 20.85 Ha on Teesta River of District- Alipurduar of State-West Bengal, Country: India offers a much-required infrastructural input for fulfilling the requirement of quality sand in West Bengal.

d)Education facilities

Jalpaiguri Zilla School is situated at 2.44 km.

e) Health Facilities

Jalpaiguri Superspeciality Hospital is situated about 4.96 km away from the lease area.

f) Religious Places

Raksha Kali Mandir is situated at 4.77 km from the project site.

g) Drinking water

Drinking water facility will be provided by the private tankers at mining site by project proponent.

h) Electricity

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

Chapter 4

ANTICIPATED IMPACTS AND THEIR MITIGATION MEASURES

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 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 development
- 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.

4.1 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 waste.

4.1.1 Anticipated impacts:

- Mining activity will impact riverbed topography by formation of excavation voids.
- Undercutting and collapse of riverbanks.
- Riverbed 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.

4.1.2 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.
- 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 riverbed 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.

4.2 WATER ENVIRONMENT

4.2.1 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.

4.2.2 Mitigation measures

Project activity will be carried out only in the dry part of the Teesta 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.

4.3 AIR ENVIRONMENT

4.3.1 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.

4.3.2 Air Modeling: The proposed project includes various activities like approach roads, haul roads, excavation and transportation of sand. These operations generally result in generation of dust and thereby pose health hazards. However, it is proposed that adequate control measures will be provided at every stage of operation such as, water sprinkling at loading, unloading points and on haul roads before transportation to reduce the fugitive dust emissions.

The mining is proposed to be carried out by opencast Semi- mechanized method. The air borne particulate matter (PM10, PM2.5) generated by transportation of sand is the main respirable air pollutant. The emissions of Sulphur dioxide (SO_2), Nitrogen Oxides (NO_2) contributed by vehicles plying on haul roads will be marginal. Prediction of impacts on air environment has been carried out taking into consideration proposed production and net increase in emissions.

4.3.3 Emissions Details: Loading - unloading and transportation of sand, wind erosion of the exposed area and movement of light vehicles will be the main polluting source in the proposed mining activities releasing Particulate Matter (PM10) affecting Ambient Air of the area. Emission Loading and unloading was calculated by the area sources. Transportation of the sand by trucks operated per hour on the haul road was calculated by the area source which was combination of line sources with each truck loaded with sand transported over the haul road of the mining area. It was assumed that truck will carry out at state permissible limit capacity of sand.

4.3.4 Model details and result: As required the meteorological data recorded during the month of December, 2023 to February, 2024 on wind speed, wind direction, temperature, and rainfall was processed to extract hourly mean meteorological data as per the guidelines of CPCB/MoEF for prediction of impacts from the area source and is given in Table C.3.7. By using the above-mentioned inputs, ground level concentrations due to the sand mining activities have been estimated to know the incremental rise in ambient air quality and impact in the study area. The effect of air pollutants upon receptors are influenced by concentration of pollutants and their dispersion in the atmosphere. Air quality modeling is an important tool for prediction, planning and evaluation of air pollution control activities besides identifying the requirements for emission control to meet the regulatory standards and to apply mitigation measures to reduce impact caused by mining activities. PM10 was the major pollutant occurred during mining activities. Impact of area source emission was considered and prediction of impact was made on various monitoring locations in the study area due to loading and unloading and ii) transportation of vehicles on the haul road of the mining area. Impact was predicted in the worst case scenario due

to combined impact of loading and unloading and emission due to transportation of vehicles on sand mine on haul road of mining area and other mining activities will occur simultaneously.

The model result is provided as **Annexure III**.

4.3.5 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 70-75%.
- 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.

4.4 NOISE ENVIRONMENT

The proposed mining activity is manual or 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.

4.4.1 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:

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.

4.4.2 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.

4.5 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 influence 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.

4.5.1 Anticipated impacts:

a) Flora

The proposed project of river bed sand mining shall be carried out on the riverbed of Teesta River. There are no trees in the project area. The project shall also not lead to any change in land use 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.

4.5.2 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.

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.

4.6 TRAFFIC ANALYSIS

4.6.1 Transportation Route:

The minerals excavated will be loaded directly into trucks and transported to the concerned market. The transportation route is shown in the map as given below:

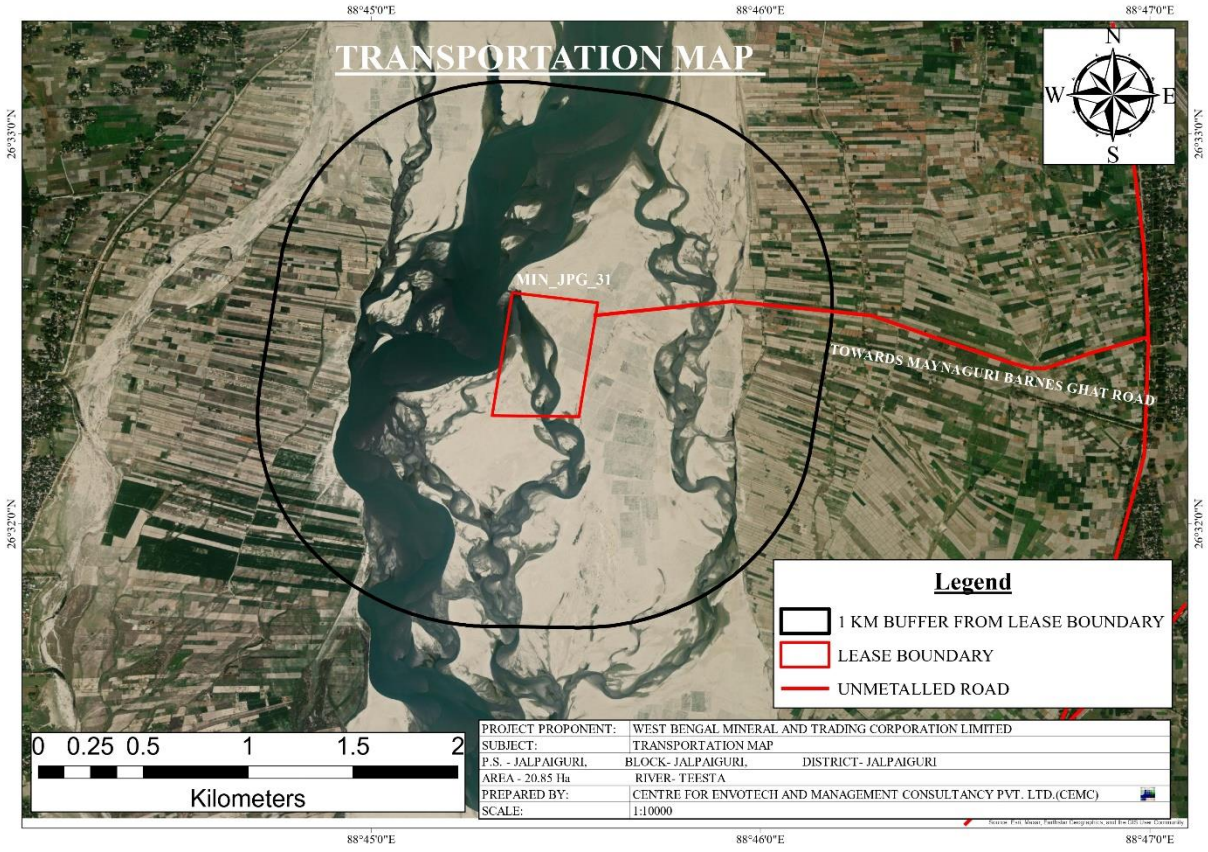


Figure No. C4-1 Map Showing Transportation Route

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 site, 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 five categories, viz., heavy commercial vehicles, light commercial vehicles, cars, two wheeler and three wheeler. As the mining site is well connected to the National Highway-27 via kuchha road. For that, two skilled people were deployed near the NH-27 for a day on dated. Total numbers of vehicles per hour has been calculated. The results of measurements are given in the.

Table No. C4-1-: Existing Traffic Scenario & LOS

S. No	**Vehicles distribution**	**NUMBER OF VEHICLES DISTRIBUTION/HOUR**	**PASSENGER CAR UNIT (PCU)**	**TOTAL NUMBER OF VEHICLE (PCU)/DAY**
		NH-27		**NH-27**
1	Heavy Commercial Vehicles	1842	1.0	1842
2	Light Commercial Vehicles	784	3.0	2352
3	Cars	1121	0.5	560.5
4	Two Wheeler	852	1.0	852
5	Three Wheeler	687	3.0	2061
	Total			7667/24 =319.4 PCU/hour

Table No. C4-2 Existing Traffic Scenario & LOS

S. No	**ROAD**	**V (VOLUME IN PCU/HR)**	**C (CAPACITY IN PCU/HR)**	**EXISTING V/C RATIO**	**LOS**
1	NH-27	319.4	1500	0.21	B

The existing Level of Service (LOS) is “B” i.e. very good.

V= Volume of Vehicles in PCU’s/Hour & C= Capacity of Road in PCU’s/Hour

Table No. C4-3 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

Table No. C4-4 Modified Traffic Scenario & LOS

S. No	**Road**	**INCREASED PCUS/NATIONAL HIGHWAY**	**V (VOLUME IN PCU/HR)**	**C (CAPACITY IN PCU/HR)**	**Modified V/C Ratio**	**LOS**
1	National Highway-27	120	319 +120= 439	1500	0.29	B

4.6.2 Results

From the above analysis the Transportation load on NH-27 will increase and the LOS will remain same after start of mining operation also, hence, there will be little change on the proposed evacuation roads due to additional traffic. However, Traffic management has been proposed as given below.

4.6.3 Traffic Management

- Roads will be repaired regularly and maintained in good conditions.
- Haul roads will be sprinkled with water to keep the dust suppressed.
- A supervisor will be appointed to regulate the traffic movement near the site.
- Speed breakers will be constructed near accident prone areas to calm the traffic and its speed.

- Signage will be erected at the sensitive & precarious places to caution or provide information to road users.

Chapter-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 ALTERNATIVES FOR MINE LEASE

Sand (minor mineral) deposits are site specific. It is present in inside riverbed (20.85 Ha). The mining of the material will be done by opencast semi-mechanized method inside riverbed. The mining will be done as per laid down procedures West Bengal Minor Mineral Concession, Stocking, Transportation of Mineral sand Prevention of Illegal Mining Rules, 1972. No overburden from inside riverbed block will be produced. Therefore, no alternative site 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. C5-1 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 Riverbed is preferred. **Benefits:** •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:** •Provides employment to local people along with financial benefits No residential building/housing is required.

3.	Labourer transportation	Public transport	Private transport	Local labours will be deployed so they will either reach mine site by Bicycle or by foot. **Benefits:** 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.

Chapter-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 complied as per conditions. For this the lessee WBMDTCL 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 advisory group will be appointed to look after all environmental issues and ensure compliance with Environmental Clearance conditions/SPCB norms. A Senior Consultant and Working group will be appointed under the advisory group. Advisory group 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.

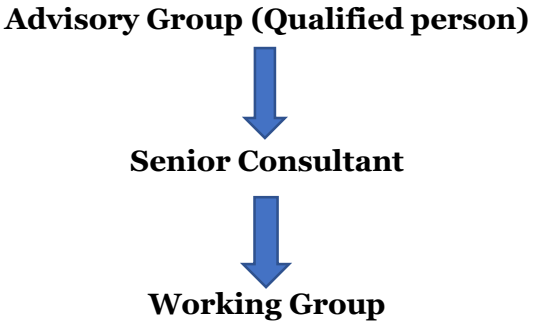


Figure No.C6-1 Hierarchy of Environment System for Dealing Environmental Issues

6.2.2 Responsibilities for Environmental Management Cell (EMC)

The responsibilities of the EMC include the following:

- Environmental Monitoring of the surrounding area.
- Development of green belt/plantation.
- Ensuring minimal use of water.
- Proper implementation of pollution control measures.
- Access the risk area.
- Implementation of QMS.
- Conducting internal audit.
- Closing of NCs and conduction of 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, 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 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. C6-1 Locations for monitoring stations

S. No.	Description	Location
1	Ambient Air Quality	Villages from the Lease Boundary
2	Noise Level Monitoring	Lease Boundary, villages from the Lease Boundary
3	Water Level and Quality	Nearby Surface water sources
4	Soil Quality	Villages near the study area.

6.5 BUDGET ALLOCATION FOR MONITORING

Budget for monitoring of Air, water, Noise and Soil will be **Rs. 3.0 Lakhs** to be incurred by the project proponent for undertaking pollution prevention measures during the mining activity.

Table No. C6-2 Budget for monitoring

S. No.	Description	Cost to be incurred (in lakhs/annum)
1	Water Quality	0.5
2	Air Quality	1.5
3	Noise Level	0.5
4	Soil quality	0.5
TOTAL		**3.0**

6.6 SUMMARY

To maintain the environmental quality within the stipulated standards, regular monitoring of various environmental components is necessary which will complied as per conditions. For this lessee WBMDTCL 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.

Chapter-7

ADDITIONAL STUDIES

7.1 INTRODUCTION

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 RISK ANALYSIS AND DISASTER MANAGEMENT PLAN

All types of industries face certain types of hazards which can disrupt normal activities abruptly. Similarly, inside riverbed 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 faces or 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.

7.4.1 Risks due to inundation

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

7.4.2 Risks Due to Failure of Pit Slope

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 maintained.

7.4.3 Risks due to Failure of Waste Dumps

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

7.4.4 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)
- Carelessly parked vehicles (*e.g*. being parked on a slope without being adequately secured)
- Unsafe coupling and uncoupling of trailers, and
- Untrained drivers
- Overturning vehicles

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

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

7.5 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.

7.5.1 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

7.5.1.1 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 proximity of sand extraction.

- There are chances of falling of cattle/children into sand pit in riverbed-- instances of death 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

7.5.1.2 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.

7.5.1.3 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.

7.5.2 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.

7.5.3 Mitigation of Hazards

7.5.3.1 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 backhoe.
- 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 riverbank and thickness of sand to be extracted from the close vicinity of that bank.
- Ponding in the riverbed shall not be allowed
- Operations during daylight only.
- No foreign material (garbage's) will be allowed to remain/spill in riverbed and catchment area, or no pits/pockets are allowed to be filled with such material.
- Stockpiling of harvested sand on the riverbank will be avoided.
- For particular operations, approaching riverbed from both the banks will be avoided.

7.6 REPLENISHMENT OF SAND DEPOSITS

The rivers are dynamic in nature. The rivers carry sediment transport is a direct function of water movement. During transport in a water body, sediment particles become separated into three categories: suspended material which includes silt + clay + sand; the coarser, relatively inactive bed load and the saltation load. Suspended load comprises sand + silt + clay-sized particles that are held in suspension because of the turbulence of the water.

The size grades defined in the circular of the Central Water Commission (CWC), Government of India, are coarse (> 0.2 mm), medium (0.2- 0.075 mm) and fine (< 0.075 mm) fractions. They correspond to fine sand; very fine sand and silt-clay on the Udden Went worth scale. The coarse and medium fractions are interpreted as 'temporarily suspended bed load' whereas the fine fraction is the 'wash load' or 'long term suspended load'.

The suspended load is further divided into the wash load which is generally considered to be the silt + clay-sized material (< 62 μm in particle diameter) and is often referred to as "fine-grained sediment". The wash load is mainly controlled by the supply of this material (usually by means of erosion) to the river. The amount of sand (>62 μm in particle size) in the suspended load is directly proportional to the turbulence and mainly originates from erosion of the bed and banks of the river. In many rivers, suspended sediment (i.e. the mineral fraction) forms most of the transported load. Bed load is stony material, such as gravel and cobbles that moves by rolling along the bed of a river because it is too heavy to be lifted into suspension by the current of the river. Bed load is especially important during periods of extremely high discharge and in landscapes of large topographical relief, where the river gradient is steep (such as in mountains). It is rarely important in low-lying areas.

7.7 SOCIAL IMPACT ASSESSMENT, REHABILITATION & RESETTLEMENT (R&R) ACTION PLAN

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

7.7.1 Impact on Demographic Composition

The proposed project will hardly make any difference in the demographic composition of the study area as the additional employment it envisages to create will be met locally to the maximum extent. Hence, the chances of immigration 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.

7.7.2 Employment Opportunities

The proposed project will provide employment to the local people. It has been estimated that **35** 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.

7.7.3 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.

7.7.4 Impact on Agriculture

The entire mining area is part of riverbed 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 Teesta & agriculture field. There will be no negative impact on agriculture because compensation will be made to the landowners 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.

7.7.5 Impact on Road Development

Movement of tractor-trolleys and other vehicles to and fro 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.

7.7.6 Income to Government

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

7.7.7 Impact on Law and Order

As most of the workers to be employed in the proposed mining project are 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.

7.7.8 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.

7.8 REHABILITATION AND RESETTLEMENT (R&R) ACTION PLAN

Since there is no habitation of human. Hence, the mining activity does not involve any displacement of human settlement. Therefore, R & R 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 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 wildlife 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 welfare works done by project proponent. There is no displacement of the population within the project area and adjacent nearby area.

Chapter: 8

PROJECT BENEFITS

8.1 INTRODUCTION

The proposed sand mining project will improve the overall economic and aesthetic scenario of the locality. This will be in form of roads, water supply, employment, living standard and economic growth.

8.2 PHYSICAL BENEITS

- Generate useful economic resource for construction.
- Improve Socio-economic conditions of surrounding areas.
- Protecting riverbanks.
- Reduce the probability of submergence of adjoining agricultural lands.
- Protection of crops being cultivated along the riverbank.
- 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 & resorts, transport etc. It will also attract other entrepreneur to establish their venture in the region.
- **Improvements in the social infrastructure: -**The social infrastructure like religious places (temple, mosque, church,); marriage homes, Bus stations, railway stations, playgrounds, stadium will be improved due to the induced impact of the proposed drug manufacturing.
- **Employment potential –skilled; semi-skilled and unskilled: -** The manpower requirement for the proposed project will be around 54 when semi-mechanized mining methodology is considered. In case of manual mining, the manpower will be increased to 584 considering one manpower can be excavate 5 Cum sand per day.
- **Other tangible benefits: -** The other tangible benefits includes metrics and improvements demonstrating process and system cost savings, compliant inspections and customer audits, faster product approvals and manufacturing throughput, less rejected material, reduced nonconformance issues, and more efficient continuous improvement and project implementation. Intangible benefits include improved staff morale, faster, more accurate transparent decision making, less employee turnover, increased staff accountability, and an enhanced culture of quality throughout the organization.

8.3 SOCIAL BENEFITS

The mining in the area will create rural employment. It has been observed that conditions of the villages around mining areas are better than that of distant villages. The mining activity in the region will have positive impact on the social economic condition of the area by way of providing employment to the local 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

2.0 % of the Project cost is incurred as Corporate Environmental Responsibility (CER) and the utilization of this amount will be in social welfare.

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 roadside 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 **8340** Nos. of **native species** along with some fruit bearing and medicinal trees during the plan period.

8.6 CONCLUSION

The management will recruit the semi-skilled and unskilled workers from the nearby villages. The project activity and the management will 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 have good leaf cover will be adopted to develop the green belt. It is proposed to plant **8340 Nos**. native species per during the mining plan period.

Chapter- 9

ENVIRONMENTAL MANAGEMENT PLAN

9.1 INTRODUCTION

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.

9.2 LAND USE PATTERN

Riverbed mining can lead to riverbank erosion and sedimentation arising from changes in hydrology due to alteration in water depths and riverbed 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:

- Mineral will be mined out after leaving sufficient safety zone from the bank as per sustainable sand mining guidelines-2016 for bank stability.
- The mining is planned in non-monsoon seasons only, so that the excavated area gets replenished during the monsoon each year.
- Pits will get replenished naturally every year after monsoon.
- Grass/plants will be planted on the bank of the river for their stability.

9.3 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. 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 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.

9.3.1 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.

9.3.2 Control of dust pollution

The main pollutant in air is PM_{10}, 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.

i. During loading operation

- 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.
- Skilled operators will operate excavators.
- Avoid overloading of dumpers and consequent spillage on the roads.
- The operators' cabin in the drills, dumpers will be provided with dust free enclosure and persons working at high dust prone areas will be provided with dust mask.

ii. During transport operation

- 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.
- Mineral carrying trucks will be effectively covered by Tarpaulin to avoid escape of fines to atmosphere.

- Regular Compaction and grading of haul roads to clear accumulation of loose material.
- Air quality will be regularly monitored both in the core zone and the buffer zone.

iii. Plantation work carried out

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.

iv. 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.

9.4 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.

9.4.1 Noise Abatement and Control

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

9.5 WATER ENVIRONMENT MANAGEMENT

Mining will not intersect the ground water table of the area. The mining does not have any impact on topography and natural drainage of surrounding area. 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 off into soak pits. Therefore, not at all disturbing water environment.

9.5.1 Wastewater management

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

9.5.2 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.

9.6 SOLID WASTE MANAGEMENT

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

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

9.7 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.

9.7.1 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. Riverbanks will be strengthened by way of plantation on the banks. A suitable combination of trees that can grow fast and have good leaf cover shall be adopted to develop the greenbelt. It is proposed to plant **8340 no.s** of native species will be planted during the plan period.

9.8 SOCIO-ECONOMIC ENVIRONMENT

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

9.9 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 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 to have preventive action in place.

VI. Any workers health related problem will be properly addressed.

VII. Periodical medical checkup will be conducted.

VIII. Promote occupational health and safety within their organization and develop safer and healthier ways of working.

IX. Help supervise the investigation of accidents and unsafe working conditions, study possible causes and recommend remedial action.

X. Develop and implement training sessions for management, supervisors and workers on health and safety practices and legislation.

XI. Coordinate emergency procedures, mine rescues, 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. C9-1 Budget for occupational health

S. No.	**Activities recommended for communities level services**	**Tentative cost (Lakh Rs)**
1	Provide free health checkups & medicines to the nearby villagers of the project site.	0.5
2	Assistance to set up a temporary health center during the lease tenure.	0.5

9.10 COST OF EMP MEASURES

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

Table No. C9.2: EMP Cost (Lakhs Rs.)

S. No.	Description	Capital Cost (lakh Rs.)
1	Pollution Control & Dust Suppression	2
2	Pollution Monitoring 1. Air pollution 2. Water pollution 3. Noise pollution 4. Soil pollution	3
3	Occupational health	1.5
3	Plantation	1.5
4	Haul road Maintenance Cost	1
Total		9

Chapter-10

SUMMARY & CONCLUSION

10.1 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 West Bengal Mineral Development and Trading Corporation Limited (WBMDTCL) dated 17.03.2023 vide memo no. 187-ICE-12011 (99)/27/2022-MINES for the period of 5 years (A copy of LOI is attached as **Annexure-I**).

The Proposed Sand Mining Project at Block: Jalpaiguri, District: Jalpaiguri, State: West Bengal, Area: 20.85 Ha for production of 233520 cum/year sand and 350280 cum/year pebbles and gravels.

10.2 PROJECT DESCRIPTION

The proposed project is for mining of Sand (Minor Mineral) by open cast semi-mechanized method in over an area of 20.85 Ha. By M/s. West Bengal Mineral Development and Trading Corporation Limited (WBMDTCL). The project site falls under seismic zone V. The total geological reserve is 2602080 Cum and total mineable reserve is 2428608 Cum. Mine lease area will be worked in benches and the digging depth will be restricted to 3.0 m only. 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 21 KLD. Total manpower requirement for the project is 54. 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.

10.3 DESCRIPTION OF ENVIRONMENT

The generation of primary data as well as collection of secondary data and information from the site and surroundings was carried out during winter season (December, 2022 to February, 2023). This collected data was further used to identify potential impacts of the mining activity on the surrounding environment and formulate mitigation measures.

Table No. C10.1: Baseline Environmental Status

Attribute	Baseline status
Ambient Air Quality	The ambient air quality study for the 3 AAQ monitoring stations (Table C.3.9) shows that the maximum and minimum ground level concentration for PM10 is respectively 84.8 µg/m3 at AQ1 and 58.9 µg/m3 at AQ3. Whereas the maximum and minimum ground level concentration for PM2.5 ranges between 47.9 µg/m3 at AQ1 and 30.5 µg/m3 at AQ3, respectively. Similarly, for SO2, the maximum and minimum ground level concentration varies between 8.6 µg/m3 and 5.0 µg/m3 for respectively AQ2 and AQ3 stations. For NO2 the maximum and minimum ground level concentration varies between 23.7 µg/m3 & 10.2 µg/m3 for respectively AQ1 and AQ2 stations showing variable range of distribution.
Noise Levels	Noise monitoring study reveals that the minimum & maximum noise levels at day time were recorded as 49.5 dB (A) at NQ4 & 57.8 dB (A) at NQ2. The minimum & maximum noise levels at night time were found to be 42.6 dB (A) at NQ1 & 52.8 dB (A) at NQ4 (Table C.3.11).
Water Quality	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 according to Criteria of CPCB for its suitability for wildlife and fisheries.
Soil Quality	Samples collected from identified locations indicate pH value of 6.98, 6.84 & 7.03, which shows that the soil is slightly alkaline in nature. Organic carbon ranges from 0.54% to 0.77 % in the soil samples and, whereas the Potassium is found to be ranging from 93 mg/kg, 94 mg/kg & 104 mg/kg (Table C.3.3).
Ecology and Biodiversity	There are no Ecologically Sensitive Areas present in the study area.

10.4 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.

10.4.1 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.

10.4.2 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 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.

10.4.3 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.

10.4.4 Impact on Water Quality

Moreover, 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. 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.

10.4.5 Impact on Soil Quality

The soil textures are a clayey-loam, loam, sandy loam. 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 solid particulates by surface or ground water. This may lead to change in porosity, permeability & other such physical characteristics of soil of the area.

10.4.6 Flora & Fauna

a) 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.

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

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.

b) Fauna

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

10.4.7 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 has created 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 in habitants; wages paid increase the per capita income.

10.5 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.

10.6 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). To maintain the environmental quality within the stipulated standards, regular monitoring of various environmental components is necessary which will complied as per conditions. For this lessee WBMDTCL 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 based on prevailing micro meteorological conditions of the area like, wind direction and wind speed, relative humidity, temperature. A budget for monitoring of Air, water, Noise will be Rs.2.0 Lakhs to be incurred by the project proponent for undertaking pollution prevention measures during the mining activity.

10.7 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 wildlife 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 welfare works done by project proponent. There is no displacement of the population within the project area and adjacent nearby area.

10.8 PROJECT BENEFITS

The management will recruit the semi-skilled and unskilled workers from the nearby villages. The project activity and the management will 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 have good leaf cover will be adopted to develop the green belt. It is

proposed to plant 8340 Nos. of native species will be planted during the mining plan period. The project proponent has allocated 2 % of total project cost annum for CER Activities. 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 riverbanks where green belt will be developed.

10.9 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. 8340 trees during plan period. A budget of Rs. 9.0 Lakh per year for EMP is incurred by project proponent.

10.9.1 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.

10.9.2 Management for Noise Pollution

As the only impact is due to transportation of sand to the construction though 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 daytime, the movement of animals during the night will not be hindered.

10.9.3 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 below ground level. The ultimate depth of the open cast pits will be 3 m below ground level.

10.9.4 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 & even Soil Erosion in the area.

10.9.5 Green Belt Development

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

10.10 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 discussion on probable impacts of all the operational activity, it has been concluded that this project will more positive impact and will generate the revenue and employment in the area. On the above facts and baseline study, the proposed activity is recommended for the commencement with proper mitigation measure as suggested.

Chapter-11

DISCLOSURE OF CONSULTANTS ENGAGED

Centre for Envotech and Management Consultancy (P) Ltd. (CEMC) is an ISO 9001:2015, OHSAS 18001:2007 &ISO 14001-2015 certified leading Forest and Environmental consultancy empaneled by State Pollution Control Board (SPCB), Odisha. It was established in 2005 & its registered office is at Plot no-522/3458, (near Utkal Hyundai Showroom) Pahal, Bhubaneswar-752101. The consultancy/firm has well-furnished laboratory equipped with modern scientific instruments for analysis of various physico-chemical parameters of soil, water and air. The technical team of CEMC (P) Ltd. has wide experience in Mineral Exploration & Mining, Environmental Impact Assessment/ Environmental Management Planning and Environmental Monitoring, Forest Diversion Proposal, Development of Various Projects like Industry & Building Projects, in Commissioning of Various Pollution Control Devices, Air Quality modeling and Hydrogeological survey, and other technical assignment for various industries. CEMC Pvt. Ltd. is Accredited by National Accreditation Board for Education and Training (NABET), Quality Council of India (QCI) as 'A' Category Consultant Organization for carrying out EIA Studies in Mining, Irrigation, Thermal Power, Coal Washery, Mineral Beneficiation including pelletisation, Metallurgical industries (ferrous and Non-ferrous), Cement Plants, Port, Harbour jetties etc, Highways, railways, transport terminals, common Municipal Solid Waste Management Facility, building and large construction projects.

CEMC (P) Ltd. Environment Laboratory got recognition by MoEF & CC, Govt. of India, under Environment (Protection) Act, 1986 and accredited by National Accreditation Board for Testing and Calibration of Laboratories (NABL- an Autonomous body under Department of Science and Technology) in accordance with the standard ISO/IEC 17025:2005.

Our aim is to provide sustainable development for the growth of Industries, a one stop service provider for all types of Industries / Mines related projects, particularly relating to environmental issue.

CORE TEAM:

The level of expertise available with us and the infrastructure we have made is imperative for us to think about of the consultancy in fulfilling its mandate of providing highest quality of works to their clients on monitoring of air, water and soil in mining and urban areas, GIS and geographical analysis, biodiversity and resource mapping of forest covers and their modeling, preparation of

EIA, EMP of various projects. To make these activities successful the expert members in respective fields with their expertization are mentioned in this chapter.

DECLARATION BY EXPERTS CONTRIBUTING TO THE EIA:

Declaration by Experts contributing to the Draft EIA Report for Environment Clearance of the proposed "Sand Mining Project" on Teesta River of Block- Jalpaiguri, Dist:-Jalpaiguri, State-West Bengal.

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

Table No. C11-1 EIA Coordinator

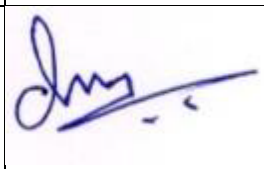
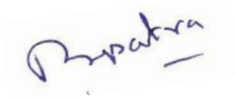
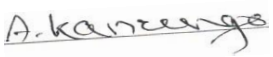
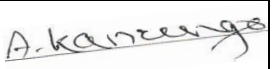
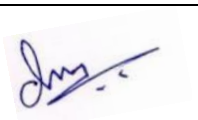
EIA Coordinator	
Name	Mr. Debashish Mishra
Signature & Date	
Period of involvement	May 2022- Till Date

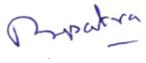
Table No. C11-2 Functional Area Experts

S. No.	Functional Areas	Name of the Experts	Involvement (period & task)	Signature and date
1	AP	Dr. B.K. Patra – FAE (B)	2020-till date	
2	WP	Ms. Mitali Rout FAE (B)	2020-till date	

3	SHW	Dr. B.K. Patra – FAE (A)	2020-till date	
4	SE	Mr. S. K. Das – FAE (A)	2020-till date	
5	EB	Mr. D. Mishra – FAE (A)	2020-till date	
6	HG	Mr. A. Kanungo – FAE (A)	2020-till date	
7	Geo	Mr. A. Kanungo – FAE (A)	2020-till date	
8	SC	Mr. D. Mishra – FAE (B)	2020-till date	
9	N&V	Dr. D. K. Pandey – FAE (A)	2020-till date	
10	LU	Dr. N. R. Das– FAE (A)	2020-till date	
11	RH	Er. A. P. Barik – FAE (A)	2020-till date	

Declaration by the Head of the Accredited Consultant Organization

I, Dr. Bidyut Kumar Patra, hereby, confirm that the above mentioned experts prepared the Draft EIA Report for Environment Clearance of the proposed "Sand Mining Project" on Teesta River of Block: Jalpaiguri, District: Jalpaiguri, State-West Bengal. I also confirm that I shall be fully accountable for any misleading information mentioned in this statement.

Signature	
Name	Bidyut Kumar Patra
Designation	Director
Name of the EIA Consultant Organaisation	CEMC Pvt. Ltd.

Annexure-I

Government of West Bengal
Department of Industry, Commerce and Enterprises
Mines Branch
4, Abanindranath Tagore Sarani (Camac Street), Kolkata-700016

No.430-ICE-12011(99)/27/2022-MINES Date : 05.07.2023

From : The Deputy Secretary
to the Government of West Bengal.

To : The Chairman and Managing Director
West Bengal Mineral Development & Trading Corporation Ltd.,
WBIIDC Building, Sector-II, Bidhannagar,
Kolkata-700091.

Sub : Provisional Grant Order for Sand Blocks to be auctioned by WBMDTCL (8th phase), reg.

Ref : Memo No. MDTC/SAND/003/Part-8/1656 dated 26.06.2023.

Sir,

With reference to the above subject, I am directed to inform you that Provisional Grant Order is hereby accorded by this Department to the West Bengal Mineral Development and Trading Corporation Ltd. for sand blocks to be auctioned by the Corporation in 8th phase.

I am also directed to request you kindly to arrange for preparation of Mining Plans and obtain Environment Clearance from the competent authority as well as other statutory clearances as per norms in order to execute Mining Lease in due course.

Yours faithfully,

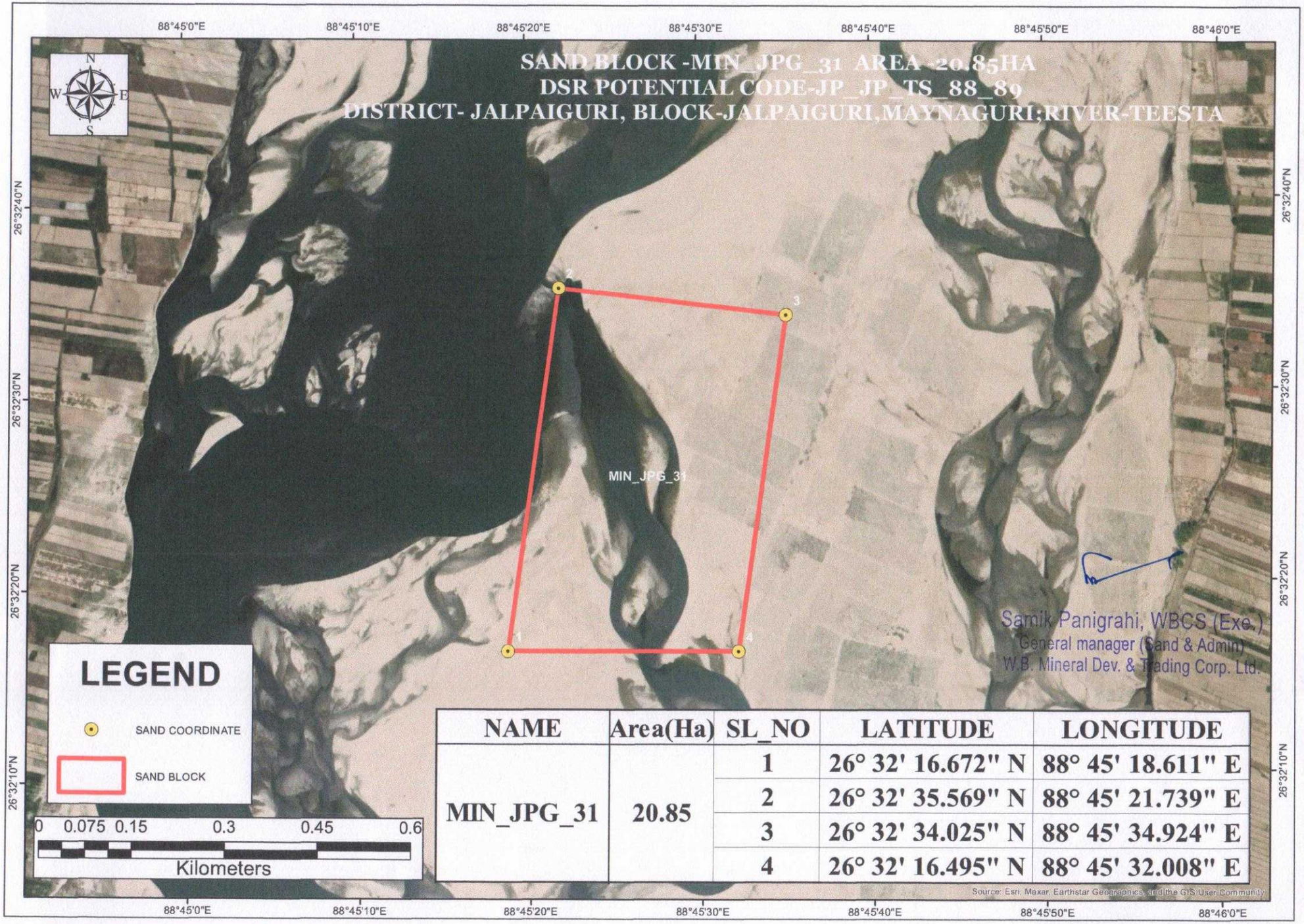
Deputy Secretary
to the Government of West Bengal

No.430/1(2)-ICE-12011(99)/27/2022-MINES Date:05.07.2023

Copy forwarded to:

1. PA to Secretary, (Mines),Dept of I,C & E, with request to place it for kind appraisal of the authority
2. Chief Mining Officer, WB, for kind information and necessary action.

Deputy Secretary
to the Government of West Bengal



NAME	Area(Ha)	SL_NO	LATITUDE	LONGITUDE
MIN_JPG_31	20.85	1	26° 32' 16.672" N	88° 45' 18.611" E
		2	26° 32' 35.569" N	88° 45' 21.739" E
		3	26° 32' 34.025" N	88° 45' 34.924" E
		4	26° 32' 16.495" N	88° 45' 32.008" E

Annexure-II

GOVERNMENT OF WEST BENGAL
OFFICE OF THE SUPERINTENDING GEOLOGIST
GEOLOGICAL PROSPECTING BRANCH,
DIRECTORATE OF MINES AND MINERALS,
KHANIJ SADAN, DESHBANDHU ROAD,
PURULIA – 723101.

No. G.P. 10-10A (WBMDTCL)/2023/80 Dated: 05/04/2024.

To:
The Chairman & Managing Director,
West Bengal Mineral Development & Trading Corporation Limited,
3rd Floor, DJ-10, WBIIDC Building
DJ Block, Sector II, Salt Lake City
Kolkata – 700091.

Sub.: - Approval of Mining Plans in respect of SAND BLOCKs in Jalpaiguri district, bearing: 1) **I.D. MIN_JPG_29 SAND MINE** under P.S. Jalpaiguri, Block: Jalpaiguri, **DSR Potential Zone Code: JP_JP_TS_80** over an Area of **18.41 Hectares**, and 2) **I.D. MIN_JPG_31 SAND MINE** under P.S. Jalpaiguri, Block: Jalpaiguri, **DSR Potential Zone Code: JP_JP_TS_88_89** over an area of **20.85 Hectares** to be leased out to West Bengal Mineral Development & Trading Corporation Limited.

Ref: IC& E Department's Order No.689/ICE-12011(99)/68/2022-MINES, dated: 30/11/2022, and, submission of 02 (Two) Hard Copies each of Mining Plans: **MIN_JPG_29 SAND MINE & MIN_JPG_31 SAND MINE** by Q.P. Mr. Shouri Dutta.

Sir,

In exercise of power conferred under **Rule 4(2) b of WBMMC Rules,2016 read with Gazette Notification No. 48-ICE/O/MIN/GEN-MIS/17/2021 dated: 25/01/2022 along with Order No. 456/ 2C-672/2022, dated: 22nd December, 2022. I, the undersigned, am hereby approving the afore-mentioned Mining Plan after their due examination & this approval is subject to the strict compliances of the following conditions, as cited below: -**

1. **(i)** The mining plans are hereby approved without any prejudice to any other law applicable to the mine from time to time whether made by Central Govt. or State Govt. or any other authority.

   (ii) The mining plans are approved without prejudice to any order in direction from any court of competent jurisdiction.

2. The approval of aforesaid mining plans does not in any way imply approval of Govt. in terms of any other law(s) in force. The approval is restricted in respect of proposal given in the said Mining Plan for the period **2024-25** with **validity upto the entire duration of the Mining Lease.**

3. The approval of these mining plans are subject to the provisions of Forest (Conservation) Act,1980& Rules made there under and other statutory orders & guidelines issued by Ministry of Environment, Forest & Climate Change, Govt. of India which may be applicable to the lease area from time to time. Forest growth if any available in the area shall not be cut off or cleared debris quarry operation without prior approval of Forest Authorities.

2. The Mining Plans are applicable for the **areas: 1) I.D. MIN_JPG_29 SAND MINE** under P.S. Jalpaiguri, Block: Jalpaiguri, **DSR Potential Zone Code: JP_JP_TS_80** over an Area of **18.41 Hectares**, and **2) I.D. MIN_JPG_31 SAND MINE** under P.S. Jalpaiguri, Block: Jalpaiguri, **DSR Potential Zone Code: JP_JP_TS_88_89** over an area of **20.85 Hectares,** bothon**Gheesh river (a tributary of Teesta river)** in **Jalpaiguri** District.

3. It is further clarified that Approval of the aforesaid **Mining Plan is subject to the provisions of the Environment Impact Assessment Notification, 2006, as amended from time to time.**

4. **It shall be ensured that, no Mining Activity shall be carried out during the Monsoon season and the workers should be advised and protected accordingly.**

5. The boundary pillar shall maintain in good order throughout the lease period of mining.

6. The annual production quantity shall be reviewed from time to time **considering replenishment rate of the rivers concerned, which will be assessed periodically on the basis of Replenishment Study. The said Mining Plans shall be reviewed/modified accordingly, if necessary.**

7. The methodology of mining work will be as per the provisions of Sustainable Sand Mining Management Guidelines, 2016 and Enforcement & Monitoring Guidelines for Sand Mining, 2020.

8. A copy of Environmental Clearance against the aforementioned Mining Plans shall be submitted to this office when the same will be issued by **the State Level Environment Impact Assessment Authority (SEIAA), West Bengal.**

Enclosure: Approved Mining Plan.

Yours faithfully,

05/04/24

Superintending Geologist

No. G.P. 10-10A(WBMDTCL)/2023/80(1/1,1/2,1/3,1/4) Date: 05/04/2024.

Copy forwarded for information to: -

1. The Director of Mines & Minerals, ShilpaSadan, 2nd Floor, 4, Abanindranath Tagore Sarani, Kolkata-700 016.
2. The Deputy Secretary, Dept. of I C & E, ShilpaSadan, 4, Abanindranath Tagore Sarani, Kolkata-700 016.
3. The Chief Mining Officer, Asansol, Court Road, Asansol, PIN: 713 304.
4. The Senior Geologist, G.P. Branch, North Bengal Unit, Siliguri, PIN: 734 004.

Superintending Geologist

Annexure-III

Location and distance from project site (km)	**Background value PM10 (98 percentile) in µg/m³ (A)**	**Incremental GLC PM10 in µg/m³ (B)**	**Total Predicted GLC PM10 in µg/m³ (A+B)**
AQ1, 3.78	82.8	1	83.8
AQ2, 3.1	84.32	1.5	85.82
AQ3, 5.03	70.96	0.5	71.46

This is a 24-h average total predicted maximum GLC at project site is (base-line + incremental) based on the monitored data of various sampling locations of PM10 occurred at project site.

Annexure-IV

Comprehensive Sand Transportation Plan

MIN_JPG_31 Sand Mine of West Bengal Mineral Development and Trading Corporation Limited is located at P.S.- Jalpaiguri, Block-Jalpaiguri, District: Jalpaiguri, State: West Bengal. Sand from MIN_JPG_31 sand block will be transported through the fair weather approach road which is not black topped. The approach road will be strengthened before transportation of sand beyond the riverbed. The total length of the approach road (aerial distance) is around 1 km upto metal road connecting to Maynaguri Barnes Ghat Road road which connects NH-27. In no circumstances the approach road within the riverbed will be hard topped. The daily production need requires around 64 trucks (considering one 200 cft capacity truck covering 8 trips) to ply which is not adding much traffic to the existing conditions. Water sprinkling shall be done beforehand of sand transportation per day.

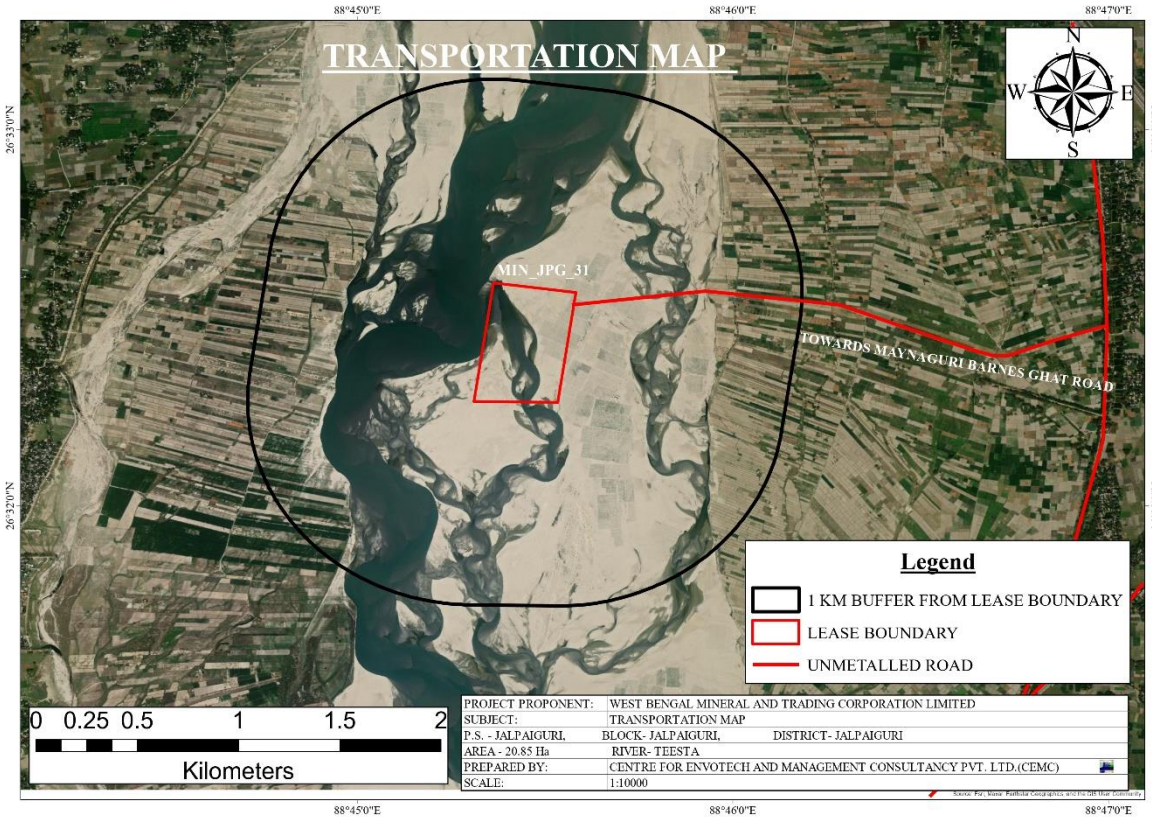


Fig: 1: Transportation Map of MIN_JPG_31

Annexure-V

WEST BENGAL MINERAL DEVELOPMENT & TRADING CORPORATION LTD.
(A Govt. of West Bengal Undertaking)

CIN : U14219WB1973SGC028707
Regd. Office : WBIIDC Building, 3rd Floor
DJ-10, Sector-II, Salt Lake, Kolkata-700091
Phone : 033-2359-0073
Website : mdtcl.wb.gov.in

Memo No: MDTC/SAND/002(iv)/779(iii)

Date : 18.04.2024

Undertaking

Undertaking is hereby provided to incur the expenses towards Corporate Environmental responsibility (CER) as per MOEF& CC's notifications Nos. F-No. 22-65/2017-IA.III dt. 30th September, 2020 and 1st May, 2018 with respect to our Sand Project MIN_JPG_31 comprising an area of 20.85 Ha, and administratively falls under P.S.: Jalpaiguri, Block- Jalpaiguri, District: Jalpaiguri, State: West Bengal. The said Sand Block is bounded by the following Geo-coordinates:

Point ID	Latitude	Longitude
1	26° 32' 16.672" N	88° 45' 18.611" E
2	26° 32' 35.569" N	88° 45' 21.739" E
3	26° 32' 34.025" N	88° 45' 34.924" E
4	26° 32' 16.495" N	88° 45' 32.008" E

WBMDTCL is committed to make the expenses upto a maximum limit of 2% of the total project cost. It is to be noted that, all the expenditure will be made in due consultation with the district authorities and also as per the recommendation of the district authorities. The main objective of this expense shall be peripheral development and environment protection. The scope of work shall be followed but not limited to the activities listed below:

1. Infrastructure development.
2. Drinking water facility.
3. Electricity development including solar projects.
4. Roads and drains.
5. Creation of water body for community use.
6. Solid Waste Management System and Scientific Studies.
7. Skill Development Programs.
8. Embankment Protection

This is also to be stated that, all communication in this regard shall be made to the Chairman SEIAA, West Bengal and activities shall be monitored under the project. The statement of expenses shall be captured in the six monthly compliance reports to be submitted to SEIAA.

Authorised Signatory
West Bengal Mineral Development and Trading Corporation Limited

Sr. Manager (Marketing)
WEST BENGAL MINERAL DEVELOPMENT
AND TRADING CORPORATION LIMITED
WBIIDC BUILDING, 3rd FLOOR, DJ-10, DJ BLOCK
SECTOR-II, SALT LAKE, KOLKATA-700091

भारतीय गुणवत्ता परिषद्
QUALITY COUNCIL® OF INDIA
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NABET

National Accreditation Board for Education and Training

Certificate of Accreditation

Centre for Envotech & Management Consultancy Pvt. Ltd., Bhubaneswar

Plot No. 522/3458 (near Utkal Hyundai Showroom) Pahal, Bhubaneswar – 752101, Odisha

*The organization is accredited as **Category-A** under the QCI-NABET **Scheme for Accreditation of EIA Consultant Organization, Version 3**: for preparing EIA/EMP reports in the following Sectors*

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1.	Mining of minerals – opencast only	1	1 (a) (i)	A
2.	Offshore and onshore oil and gas exploration, development & productions	2	1 (b)	A
3.	River Valley projects	3	1 (c)	A
4.	Thermal power plants	4	1 (d)	B
5.	Coal washeries	6	2 (a)	A
6.	Mineral beneficiation	7	2 (b)	A
7.	Metallurgical industries (ferrous & non-ferrous)	8	3 (a)	A
8.	Cement Plants	9	3(b)	A
9.	Petroleum refining industry	10	4 (a)	A
10.	Petro-chemical complexes (industries based on processing of petroleum fractions & natural gas and/or reforming to aromatics)	18	5 (c)	A
11.	Distilleries	22	5 (g)	A
12.	Sugar Industry	25	5 (j)	B
13.	Highways	34	7 (f)	A
14.	Common Municipal Solid Waste Management Facility (CMSWMF)	37	7 (i)	B
15.	Building and construction projects	38	8 (a)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in SAAC minutes dated July 12, 2024, 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/24/3344 dated August 29, 2024. The accreditation needs to be renewed before the expiry date Centre for Envotech and Management Consultancy Private Limited, Bhubaneswar following due process of assessment.

Issue Date
Aug. 29, 2024

Valid up to
Mar. 03, 2025

Mr. Ajay Kumar Jha
Sr. Director - NABET

Certificate No.
NABET/EIA/22-25/SA 0226

Prof (Dr) Varinder S Kanwar
CEO - NABET

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

National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

CENTRE FOR ENVOTECH AND MANAGEMENT CONSULTANCY PVT. LTD. (LAB DIVISION)

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

PLOT-800/1274, JOHAL, PAHAL, BHUBANESWAR, ODISHA, INDIA

in the field of

TESTING

Certificate Number: TC-13501

Issue Date: 15/04/2024 **Valid Until:** 14/04/2026

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of thislaboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Entity: CENTRE FOR ENVOTECH AND MANAGEMENT CONSULTANCY PVT. LTD.

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

सत्यमेव जयते

File No: EN/T-II-I/110/2024

Government of India

Ministry of Environment, Forest and Climate Change

(Issued by the State Environment Impact Assessment Authority(SEIAA), WEST BENGAL)

****

Dated **19/07/2024**

To,

WEST BENGAL MINERAL DEVELOPMENT AND TRADING CORPORATION LIMITED
13, NELLIE SENGUPTA SARANI 2ND FLOOR, KOLKATA , KOLKATA, WEST BENGAL, NEW MARKET, 700087
wbmdtcltd@gmail.com

Subject: Grant of Terms of Reference under the provision of the EIA Notification 2006-regarding.

Sir/Madam,

This is in reference to your application for Grant of Terms of Reference under the provision of the EIA Notification 2006-regarding in respect of project MIN_JPG_31 submitted to Ministry vide proposal number SIA/WB/MIN/469939/2024 dated 23/05/2024.

2. The particulars of the proposal are as below :

(i) TOR Identification No.	TO24B0107WB5651883N
(ii) File No.	EN/T-II-I/110/2024
(iii) Clearance Type	TOR
(iv) Category	B1
(v) Project/Activity Included Schedule No.	1(a) Mining of minerals
(vii) Name of Project	MIN_JPG_31
(viii) Name of Company/Organization	WEST BENGAL MINERAL DEVELOPMENT AND TRADING CORPORATION LIMITED
(ix) Location of Project (District, State)	JALPAIGURI, WEST BENGAL
(x) Issuing Authority	SEIAA
(xii) Applicability of General Conditions	no
(xiii) Applicability of Specific Conditions	no

3. In view of the particulars given in the Para 1 above, the project proposal interalia including Form-1(Part A and B) were submitted to the Ministry for an appraisal by the State Environment Impact Assessment Authority (SEIAA) in the Ministry under the provision of EIA notification 2006 and its subsequent amendments.

4. The above-mentioned proposal has been considered by State Environment Impact Assessment Authority(SEIAA) in

the meeting held on 28/06/2024. The minutes of the meeting and all the Application and documents submitted [(viz. Form-1 Part A, Part B, Part C EIA, EMP)] are available on PARIVESH portal which can be accessed by scanning the QR Code above.

5. The SEIAA, in its meeting held on 28/06/2024, based on information & clarifications provided by the project proponent and after detailed deliberations recommended the proposal for grant of Terms of Reference under the provision of EIA Notification, 2006 and as amended thereof subject to stipulation of specific and general conditions as detailed in Annexure (1).

6. The SEIAA has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after accepting the recommendations of the State Expert Appraisal Committee (SEAC) hereby decided to grant Terms of Reference for instant proposal of M/s. WEST BENGAL MINERAL DEVELOPMENT AND TRADING CORPORATION LIMITED under the provisions of EIA Notification, 2006 and as amended thereof.

7. **Potential impact study in the EIA should be done considering the cumulative effect of all the mines in the cluster situation, if any.**

8. The Ministry reserves the right to stipulate additional conditions, if found necessary.

9. The Terms of Reference to the aforementioned project is under provisions of EIA Notification, 2006. It does not tantamount to approvals/consent/permissions etc. required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/ Regulations or Statutes, as applicable, to the project.

10. **The ToR is valid for a period of 3 years from the date of issue. EIA/EMP to be submitted before the expiry of the ToR for consideration of EC applications.**

11. This issues with the approval of the Competent Authority.

Annexure 1

Specific Terms of Reference for (Mining Of Minerals)

1. A. Standard Terms Of Reference

S. No	Terms of Reference
1.1	1. Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994. 2. A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given. 3. All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee. 4. All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone). 5. Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics. 6. Details about the land proposed for mining activities should be given with information as to

S. No	Terms of Reference
	whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority. 7. It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors. If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/ conditions. The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report. 8. Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided. 9. The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period. 10. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given. 11. Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given. 12. A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees. 13. Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of Net Present Value (NPV) and Compensatory Afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished. 14. Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated. 15. The vegetation in the RF / PF areas in the study area, with necessary details, should be given. 16. A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted. 17. Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished. 18. A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and

S. No	Terms of Reference
	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 Department 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 sectorial programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report. 22. One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given. 23. Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map. 24. The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated. 25. Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided. 26. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided. 27. Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided. 28. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished. 29. Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out. 30. Information on site elevation, working depth, groundwater table etc. Should be provided both in

S. No	Terms of Reference
	AMSL and bgl. A schematic diagram may also be provided for the same. 31. A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution. 32. Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines. 33. Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report. 34. Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report. 35. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed. 36. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations. 37. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation. 38. Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project. 39. Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project. 40. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given. 41. The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out. 42. A Disaster management Plan shall be prepared and included in the EIA/EMP Report. 43. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc. 44. Besides the above, the below mentioned general points are also to be followed:- a. Executive Summary of the EIA/EMP Report (enclosed as **Annexure – A**). b. All documents to be properly referenced with index and continuous page numbering. c. Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated. d. Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project. e. Where the documents provided are in a language other than English, an English translation should be provided.

S. No	Terms of Reference
	f. The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted. g. While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed. h. 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. i. As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable. j. 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.

2. B. Additional Terms Of Reference Imposed By Seac –

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2.1	1) Drone videography of the entire project area explicitly showing the entire project site along with the existing tree plantation/green belt. Minimum 2 minute video to be submitted. 2) Means of access and egress between the embankment and the sand quarry may be clearly earmarked. The Project Proponent must commit that no hard toping or paving of any haulage route within the riverbed will be attempted. 3) A plan on the management and handling of sand during the period of intermediate stockpiling should be submitted. 4) **The PP has to do tree plantation in an area equivalent to 33% of the lease area @2500 trees / ha within first two years from the starting of the mining operation.** A Progressive Greenbelt Plan may be prepared. The project area being entirely on the riverbed, afforestation/ vegetation should be attempted alongside the village roads or other public land. This may be done with prior approval of the local self-governing bodies. If no public land is available for the purpose the Project Proponent shall arrange for land with his personal means. To enhance success/ survival rate the plantation shall be attempted during the first two years of the project life and the plantation so done shall be taken care of during the rest of the project life. Species of the plant selected should be self-sustaining in that particular region. Spatial year wise progressive plantation programme to be submitted. 5) Plan showing spatial year wise distribution of the proposed greenbelt has to be submitted along-with supporting documents of administrative approval/s. 6) Being a mine in operation, the plantation created so far may be submitted with geotagged photographs. 7) EIA should also include detailed study of the baseline condition and impact on aquatic flora and fauna. 8) The project cost may include the auction bid value, estimated royalty to be paid, cost of any infrastructure built like office space, stockyard, etc. The calculation/documents to estimate the project cost should be submitted. The planned expenditure for components like need-based activities may be derived based on the project cost. 9) A need-based EMP may be prepared in accordance with the MoEF&CC Office Memorandum vide F. No. 22-65/2017.IA.III dated 30.09.2020. Record of communications made in this regard

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	with the identified/ intended beneficiaries (schools/ institutions etc) may also be uploaded. Evidence of the activities should be provided by photographs with geo-coordinates. The activities should be completed within the first two years of the project life. 10) A study report on base flow level measured at 5 points with date and supporting photographs should be submitted. It should be committed that mining will be done at least 1m above the base flow level. Accordingly, if required, the excavation plan may also be revised. 11) Management plan including the final closure plan of haul road to be submitted. 12) Sieve analysis report for grain size distribution should be provided. 13) Study and protection plan of the aquatic life available both during the mining and non-mining seasons should be provided. The PP shall, – while applying for environmental clearance, upload in the PARIVESH portal, the EIA/EMP report along with the documents/ submissions/ clarifications sought hereinabove. The West Bengal Pollution Control Board shall arrange public hearing as per EIA Notification, 2006 on submission of draft EIA/EMP prepared by the Project Proponent as per the above-mentioned ToRs. All the issues mentioned in the 'Public Hearing Report' and public consultation must also be addressed and incorporated in the final EIA / EMP report. The project proponent is requested to pursue the matter with the WBPCB for organizing the public hearing/consultation on submission of the draft EIA/EMP report as per the provision of EIA notification 2006 & its amendments. The project proponent is requested to submit the final EIA/EMP prepared as per the above-mentioned ToRs and incorporating all the issues raised during Public Hearing / Public Consultation to the SEAC for further consideration of the proposal for environmental clearance. The ToR is valid for a period of 3 (three) years from the date of issue.

3. Annexure - A

S. No	Terms of Reference
3.1	**Annexure - A** **Executive Summary** The Executive summary of the EIA/EMP report in about 8-10 pages should be prepared incorporating the information on following points: 1) Project name and location (Village, District, State, Industrial Estate (if applicable). 2) Products and capacities. If expansion proposal, then existing products with capacities and reference to earlier EC. 3) Requirement of land, raw material, water, power, fuel, with source of supply (Quantitative). 4) Process description in brief, specifically indicating the gaseous emission, liquid effluent and solid and hazardous wastes. 5) Measures for mitigating the impact on the environment and mode of discharge or disposal. 6) Capital cost of the project, estimated time of completion. 7) Site selected for the project - Nature of land - Agricultural (single/double crop), barren, Govt./private land, status of is acquisition, nearby (in 2-3 km.) water body, population, with in 10km. other industries, forest, eco-sensitive zones, accessibility, (note - in case of industrial estate this information may not be necessary). 8) Baseline environmental data - air quality, surface and ground water quality, soil characteristic, flora and fauna, socio-economic condition of the nearby population. 9) Identification of hazards in handling, processing and storage of hazardous material and safety system provided to mitigate the risk. 10) Likely impact of the project on air, water, land, flora-fauna and nearby population. 11) Emergency preparedness plan in case of natural or in plant emergencies. 12) Issues raised during public hearing (if applicable) and response given. 13) Environment Management Plan (EMP) as per Office Memorandum issued by the MoEF & CC

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	vide F. No. 22-65/2017-IA.III dated 30.09.2020 with proposed expenditure. 14) Occupational Health Measures. 15) Post project monitoring plan.

Standard Terms of Reference for (Mining of minerals)

1.

S. No	Terms of Reference
1.1	An EIA-EMP Report shall be prepared for peak capacity (…..MTPA)operation in an ML/project area of.....ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.
1.2	An EIA-EMP Report would be prepared for peak capacity operation to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modeling for..... MTPA of coal production based on approved project/Mining Plan for.....MTPA. Baseline data collection can be for any season (three months) except monsoon.
1.3	If the washery is located within the mine lease or near to the mine lease its location should be cited seperately also, providing pillar cordinates and site layout plan. Insuch cases cumulative impact of mine operation with washery to be assessd and EMP measure to be drawn to the worst scenario
1.4	Plan of mechanized transportation of coal to coal washery also for rejects and washed coal to be drawn
1.5	Propoer KML file with pin drop and coordinate of mine at 500-1000 m interval be provided
1.6	A Study area map of the core zone (project area) and 10 km area of the buffer zone (1: 50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries, mines, coal washery and other polluting sources. In case of ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found in the 15 km study area should be given. The above details to be furnished in tabular form also
1.7	Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas (as per records), along with other physical features such as water bodies, etc should be furnished.
1.8	A contour map showing the area drainage of the core zone and 25 km of the study area (where the water courses of the core zone ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.
1.9	Catchment area with its drainage map of 25 km area within and outside the mine shall be provided with names, details of rivers/ riverlet system and its respective order. The map should clearly indicate drainage pattern of the catchment area with basin of major rivers. Diversion of drains/ river

S. No	Terms of Reference
	need eloboration in form of lengthe, quantity and quality of water to be diverted
1.10	(Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included. The Progressive mine development and Conceptual Final Mine Closure Plan should also be shown in figures. Details of mine plan and mine closure plan approval of Competent Authority should be furnished for green field and expansion projects.
1.11	Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology and equipment proposed to be used vis-à-vis the potential impacts should be provided.
1.12	Impact of mining on hydrology, modification of natural drainage, diversion and channeling of the existing rivers/water courses flowing though the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.
1.13	A detailed Site plan of the mine showing the proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, CHP, ETP, Stockyard, township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification of thereof in terms of construction of embankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads, major haul roads, etc should be indicated.
1.14	Original land use (agricultural land/forestland/grazing land/wasteland/water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations should be analyzed. Extent of area under surface rights and under mining rights should be specified. Area under Surface Rights S.N ML/Project Land use Area under Surface Rights(ha) Area Under Mining Rights(ha) (ha) Area under Both (ha) 1 Agricultural land 2 Forest Land 3 Grazing Land 4 Settlements 5 Others (specify) S.N. Details Area (ha) 1 Buildings 2 Infrastructure 3 Roads 4 Others (specify) Total
1.15	Study on the existing flora and fauna in the study area (10km) should be carried out by an institution

S. No	Terms of Reference
	of relevant discipline. The list of flora and fauna duly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained and furnished.
1.16	One-season (other than monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided. The detail of NABL/ MoEF&CC certification of the respective laborartory and NABET accreditation of the consultant to be provided.
1.17	Map (1: 50, 000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided. The number and location of the sampling stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Observed values should be provided along with the specified standards.
1.18	For proper baseline air quality assessment, Wind rose pattern in the area should be reviewed and accordingly location of AAMSQ shall be planned by the collection of air quality data by adequate monitoring stations in the downwind areas. Monitoring location for collecting baseline data should cover overall the 10 km buffer zone i.e. dispersed in 10 km buffer area. In case of expansion, the displayed data of CAAQMS and its comparison with the monitoring data to be provided
1.19	A detailed traffic study along with presence of habitation in 100 mts distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along the road which will indirectly contribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report.
1.20	The socio-economic study to conducted with actual survey report and a comparative assessment to be provided from the census data should be provided in EIA/ EMP report also occupational status & economic status of the study area and what economically project will contribute should be clearly mention. The study should also include the status of infrastructural facilities and amenities present in the study area and a comparative assessment with census data to be provided and to link it with the initialization and quantification of need based survey for CSR activities to be followed.
1.21	The Ecology and biodiversity study should also indicate the likely impact of change in forest area for surface infrastructural development or mining activity in relation to the climate change of that area and what will be the compensatory measure to be adopted by PP to minimize the impact of forest diversion.
1.22	Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower for the mine should be submitted.

S. No	Terms of Reference
1.23	Impact of proposed project/activity on hydrological regime of the area shall be assessed and report be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted
1.24	Impact of mining and water abstraction from the mine on the hydrogeology and groundwater regime within the core zone and 10 km buffer zone including long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/or if the area falls within dark/grey zone.
1.25	Study on land subsidence including modeling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues should be carried out.
1.26	Detailed water balance should be provided. The break up of water requirement as per different activities in the mining operations, including use of water for sand stowing should be given separately. Source of water for use in mine, sanction of the Competent Authority in the State Govt. and impacts vis-à-vis the competing users should be provided.
1.27	PP shall submit design details of all Air Pollution control equipment (APCEs) to be implemented as part of Environment Management Plan vis-à-vis reduction in concentration of emission for each APCEs
1.28	PP shall propose to use LNG/CNG based mining machineries and trucks for mining operation and transportation of coal. The measures adopted to conserve energy or use of renewable sources shall be explored
1.29	PP to evaluate the green house emission gases from the mine operation/ washery plant and corresponding carbon absorption plan.
1.30	PP shall explore the use of vent gases as generated from under ground Mine for use of energy generation/ in house energy consumption
1.31	Site specific Impact assessment with its mitigation measures, Risk Assessment and Disaster Preparedness and Management Plan should be provided.
1.32	Impact of stowing by using coal washery rejects/ flyash/ bottom ash shall be assessed in term of leachate generation and its characteristics
1.33	Impact of choice of mining method, technology, selected use of machinery and impact on air quality, mineral transportation, coal handling & storage/stockyard, etc, Impact of blasting, noise and vibrations should be provided.
1.34	Impacts of mineral transportation within the mining area and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions should be provided. Impacts of transportation, handling, transfer of mineral and waste on air quality, generation of effluents from workshop etc, management plan for maintenance of HEMM and other machinery/equipment should be given. Details of various facilities such as rest areas and canteen for workers and effluents/pollution load emanating from these activities should also be provided.
1.35	Effort be made to reduce/eliminate road transport of coal inside and outside mine and for mechanized loading of coal through CHP/ Silo into wagons and trucks/tippers.

S. No	Terms of Reference
1.36	Details of various facilities to be provided to the workers in terms of parking, rest areas and canteen, and effluents/pollution load resulting from these activities should also be given.
1.37	The number and efficiency of mobile/static water jet, Fog cannon sprinkling system along the main mineral transportation road inside the mine, approach roads to the mine/stockyard/siding, and also the frequency of their use in impacting air quality should be provided.
1.38	Impacts of CHP, if any on air and water quality should be given. A flow chart showing water balance along with the details of zero discharge should be provided.
1.39	Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the pre- mining status should be provided. A Plan for the ecological restoration of the mined out area and post mining land use should be prepared with detailed cost provisions. Impact and management of wastes and issues of re-handling (wherever applicable) and backfilling and progressive mine closure and reclamation should be furnished.
1.40	Adequate greenbelt nearby areas, coal stock yard and transportaion area of coal shall be provided with details of species selected and survival rate Greenbelt development should be undertaken particularly around the transport route and CHP.
1.41	Cost of EMP (capital and recurring) should be included in the project cost and for progressive and final mine closure plan.
1.42	Details of R&R. Detailed project specific R&R Plan with data on the existing socio- economic status of the population (including tribals, SC/ST, BPL families) found in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc and costs along with the schedule of the implementation of the R&R Plan should be given.
1.43	CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project should be given.
1.44	Corporate Environment Responsibility: a) The Company must have a well laid down Environment Policy approved by the Board of Directors. b) The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms conditions. c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished. d) To have proper checks and balances, the company should have a well laid down 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. e) Environment Managament Cell and its responsibilities to be clearly spelt out in EIA/ EMP report. f) In built mechanism of self-monitoring of compliance of environmental regulations should be indicated.
1.45	Submission of sample test analysis of Characteristics of coal: This should include details on grade of coal and other characteristics such as ash content, S and heavy metals including levels of Hg, As, Pb, Cr etc.

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1.46	Status of any litigations/ court cases filed/pending on the project should be provided.
1.47	PP shall submit clarification from PCCF that mine does not falls under corridors of any National Park and Wildlife Sanctuary with certified map showing distance of nearest sanctuary.
1.48	Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closer plan approval. NOC from Flood and Irrigation Dept. (if req.), etc. wherever applicable.
1.49	Details on the Forest Clearance should be given as per the format given: Total Project Area (ha) / ML Total Forest land (ha) If more than one provide details of each FC / Date of FC / Extent of Forest Land / Balance area for which FC is yet to be obtained / Status of appl For diversion of forest land
1.50	In case of expansion of the proposal, the status of the work done as per mining plan and approved mine closure plan shall be detailed in EIA/ EMP report
1.51	Details on Public Hearing should cover the information relating to notices issued in the newspaper, proceedings/minutes of Public Hearing, the points raised by the general public and commitments made by the proponent and the time bound action proposed with budgets in suitable time frame. These details should be presented in a tabular form. If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided.
1.52	PP shall carry out survey through drone highlighting the ground reality for atleast 10 minutes
1.53	Detailed Chronology of the project starting from the first lease deed alloted/Block allotment/ Land acquired to its No. of renewals, CTO /CTE with details of no. renewals, previous EC(s) granted details and its compliance details, NOC details from various Govt bodies like Forest NOC(s), CGWA permissions, Power permissions, etc as per the requisites respectively to be furnished in tabular form.
1.54	A copy of application submitted for 5 star rating system to Ministry of coal for expansion cases may be provided. Certificate /rating given to project shall be provided with EIA-EMP report
1.55	The first page of the EIA/ EMP report must mention the peak capacity production, area, detail of PP, Consultant (NABET acrreditation) and Laboratory (NABL / MoEF & CC certification)
1.56	The compliances of ToR must be properly cited with respective chapter section and page no in tabular form and also mention sequence of the respective ToR complied within the EIA-EMP report in all the chapter's section.
1.57	The need based activity should be completed within a period of first two years of the project life. The need based activities plan containing year-wise allocation of funds for each of the activities proposed, specific information related to each activity like name of school/institution, location etc and name of Govt. bodies/agencies in collaboration with whom each activity would be executed should be submitted with the EIA Report.